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JANUARY, 1859.

[THIRD SERIES.

THE
FARMER'S MAGAZINE,
AND
MONTHLY JOURNAL
OF
THE AGRICULTURAL INTEREST.

Dedicated

TO THE

FARMERS OF THE UNITED KINGDOM.

LONDON :

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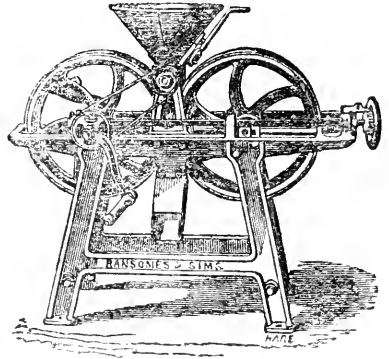
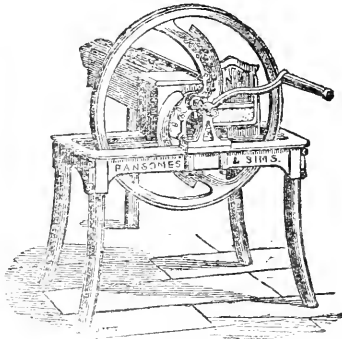
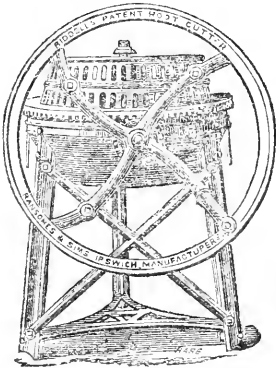
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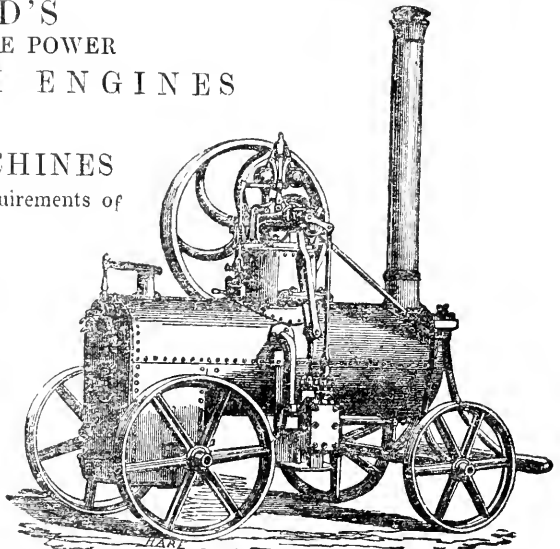
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Mr. Braithwaite Poole, in his Statistics of British Commerce, tells us that "there are annually used in the United Kingdom 90,000,000 tons of farm-yard or animal manure, exclusive of guano, nitrate of soda, and other artificial fertilizers, involving a money value of £25,000,000. Anything, therefore, that would economize the labour of transporting and spreading bulky farm-yard manure, by giving us a more concentrated and portable fertilizer for our soils—anything that will render us less dependent upon the Peruvian Government for guano—must be hailed as a national boon."

Viscount Palmerston, in a speech made at the Romsey Agricultural Society's Meeting, on the 9th of December, 1858, stated:—"There is one thing that I wish to press upon your attention; guano is a material of limited quantity, and the regions that produce it are not likely to be replenished when once their stock of guano is exhausted, because the birds from which guano is created are driven away; and, like coal, when it is once dug up, you cannot expect to have it reproduced. * * * At all events, I think that the time is not very far distant when the foreign supply will cease, and when domestic guano will be the source to which the farmer must apply."

The annual importation of Peruvian guano now exceeds 250,000 tons, realizing from £12 to £15 per ton. Fish being, to a certain extent, the source of this most valuable fertilizer (*i. e.*, the excrement of the guano-bird, feeding upon fish), its manufacture into a manure has already led to some practical research; but, owing primarily to the neglect of economy in its reduction, and the complicated mechanical appliances experimentally used therein, those efforts were not attended with commercial success. This Company is now, however, in possession of a process whereby fish can be converted into a most valuable manure, by simple and inexpensive means.

The following is condensed from a report by Professor Way (of the Royal Agricultural Society of England) on fish manure:—"It is perfectly practicable to produce from fish a portable manure of great value,

not subject to alteration by keeping under ordinary circumstances. There cannot be a doubt of the value of this manure, especially for corn crops; and the manufacture of manure from fish offers the only available means of supplying the demand for additional ammoniacal manure, and will, if carried out on an adequate scale, be of essential benefit to the agriculture of this country."

The first station for the operations of this Company will be at Great Yarmouth, which annually affords many thousand tons of refuse and broken fish; but to provide an abundant supply of material, it is intended hereafter to establish depots at most of the principal fishing stations on the English and Irish coasts.

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A Laboratory will be established at the London works, under the superintendence of an eminent chemist, for the express purpose of affording to Shareholders in this Company the means of obtaining a complete analysis, gratis, of the component parts of their lands, and advice as to what class of manures should be supplied to render those lands most fertile and productive, thus presenting them with the means, free of expense, of complying with the requirements anticipated by Professor Liebig, who says—"A time will come when plants growing upon a field will be supplied their appropriate manures, prepared in chemical manufactories; when a plant will receive only such substances as actually serve it for food."—*Vide Chemistry in its application to Agriculture.*

The Directors will not set out an array of figures to illustrate the profits likely to be derived by the Company, but they will undertake to supply the finest Fish Manure, guaranteed to contain a given per centage of ammonia and phosphates, at a cost which will bear very favourable comparison with Peruvian guano, and all other portable fertilizers, and still retain a profit of no ordinary character.

For evidence of the great value of the Patent Fish Manure, the attention of the Public is invited to the detailed prospectus of the Company, which contains copies of the certificates of five of the most eminent agricultural chemists of the day, the average of which yields a return of 9.84 per cent. of nitrogen equal to 12.09 of ammonia.

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Beautifully Illustrated,

PRICE ONE SHILLING.

THIS Popular Miscellany has been established for the especial entertainment and instruction of Ladies; and its large and increasing circulation has fulfilled the anticipations of the present proprietor that this work supplies a want which has long been felt. It contains original Articles and Tales by most distinguished writers; Work Patterns by *Aiguillette*; and the Fashions by *Madame Devy*.

“Without any of the feebleness commonly mistaken for femineity, the ‘Ladies’ Companion’ is really a periodical in every way acceptable to well-educated ladies, for light reading and useful information.”—*Felix Farley’s Journal*.

“Affording as it does amusement and instruction both in art and literature, we can confidently recommend it to the special attention of our fair readers.”—*Galway Vindicator*.

“This admirable periodical deserves warm commendation. Its pages are replete with light and entertaining reading; nor is the useful altogether neglected.”—*Gloucester Journal*.

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“We have received the September Part of this very interesting and instructive periodical, which fully sustains its previous character. We trust none of our fair readers will deprive themselves of the pleasure of an acquaintance with this exceedingly cheap and useful work.”—*Clare Journal*.

“Great improvements have been made in this Magazine, however excellent it was from the beginning. Its fourth volume opens in a more portable form, yet enables the conductors to include several additional pages of letter-press, whilst all the more attractive features are retained.”—*Kilkenny Moderator*.

“The projectors of ‘The Ladies’ Companion’ have marshalled around them an array of talent such as is but seldom seen concentrated in the service of one sheet, and its pages bear the impress of names of which any nation might well be proud.”—*Ulster General Advertiser*.

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Vol. XIV., elegantly bound in green and gold cloth, 7s. 6d., is now published.

Office of Publication and Advertisements, 246, Strand, London.





THE FARMER'S MAGAZINE.

JANUARY, 1859.

PLATE I.

“MOSS ROSE,” AND HER DAUGHTER, “YOUNG MOSS ROSE:”

PRIZE SHORTHORN COWS,

THE PROPERTY OF MR. RICHARD STRATTON, OF BROAD HINTON, SWINDON.

“Do you know Mr. Stratton?” “Yes, I do,” (replied the Colonel). “Then,” said the gentleman, “if you belong to Wiltshire, you ought to be proud of such a man.” “I speak the sentiments of the gentlemen of Wiltshire, and I trust the farmers of Wiltshire (replied the Colonel), when I say that we do value him; but may I ask, said I, to what you allude particularly in connection with Mr. Stratton?” “I allude (said my friend) to what I saw in Baker-street. Mr. Stratton there took the gold medal and the £25 prize; and he took that which I believe he prizes more than all—the silver medal for being the breeder of the animals which he showed.” “And may I ask, said I, whether you had a prize?” “I had, he said: I had a medal for an animal which I brought out of Devonshire;” and this led him, after making some remarks upon the Chippenham Association, about which he said he had heard a great deal, to speak of the very unsatisfactory price at which fat cattle is selling in the London market. In proof of which he told me that he could not get there the same price for the fat ox which he took to the show as he could have obtained for it before it left Devonshire. I asked him how he accounted for this? “Why,” said he, “the real cause of it, in my opinion, is the immense quantity of game which is bred in this kingdom; and the number of gentlemen who sell game now in the market would, to many persons, be almost incredible. To that cause, and to it alone,” he said, “I attribute the great depreciation which has lately taken place in the value of fat stock—the fact is, the abundance of game which is forced into the market supersedes

the sale of a great deal of the best of the meat which is sent to London.” “But,” I said, “every man has a right to do what he likes with his own.” “Yes, that is very true,” he said; “but it does not alter the fact; and, as I said before, I cannot attribute the depreciation of meat in London to any other cause than that.”

The above is from the speech of Colonel Boldero, at a meeting of the Chippenham Agricultural Society, a week or two since, and details a conversation the gallant gentleman had with a stranger in the train going down. As apropos of Mr. Stratton, he was an exhibitor, and, as usual, a successful one here. The extract comes quite as well home now, for both the cows in our print have been known by themselves and their produce at the Wiltshire Shows.

Moss Rose, calved March, 1838, was by Phoenix (6290), from a heifer bought of Mr. Clark, a cattle dealer, and said to be from a pure-bred stock; but no attempt was made to trace the pedigree during the life of Clark, and now such inquiry would be useless. Moss Rose, during her time, won the following prizes:—

In 1841, when three years old, first prize and sweepstakes, at Wootton Bassett, with the calf Young Moss Rose at her side, £3.

1842.—First prize as breeding cow, under 4 years, at the Devizes meeting, £13; the prize at Wootton Bassett, as the best cow of any age, £5.

1843.—At Devizes, best cow of any age, £3; Cirencester, £10; and Bath, £5.

1844.—As best cow with offspring, at Cirencester, £10; and at Bath, £5.

1845.—At Cirencester, best breeding cow, £8 ; and—

1848.—At Gloucester, best cow and calf, £10.

PRODUCE.

Dec., 1841.—Young Moss Rose, by Lottery (4280).

Jan., 1842.—White bull, Young Phoenix, a winner of three prizes.

1844.—White heifer, when exhibited with its dam, won three prizes, and sold at a high price when one year old.

1845.—Red heifer, a winner at Bristol and Wootton Bassett, as best heifer calf; sold to Lord Radnor.

1846.—Red heifer calf, by Kenilworth—dead.

Jan., 1847.—Red heifer, Ruby, by Kenilworth, winner of ten prizes, and dam of the bull Waterloo. Her dead weight was 195 stone.

Dec., 1847.—The heifer Matchless, by Red Duke, winner of twenty prizes, amounting to £116, dam of Fair Maid, sold for France, at 2 years old, for £200; and of Sanspareil, also sold for France, and exhibited at both the Paris shows, winning two gold medals and two prizes of £40 each. She also bred Lord of the Manor, a very celebrated prize bull.

Dec., 1848.—Red bull calf, sold to Lord Barrington.

1850.—Bull Clarendon. This bull won twenty prizes, amounting to £146, and is still in use. From him sprung the white London gold medal ox, and many other prize winners.

1851.—Roan cow calf Matchless 2nd, winner of twenty-two prizes; dam of Matchless 4th, by Waterloo (almost her full brother). Matchless 4th took the second prize at Chester, and has won ten other prizes, although only 3 years old.

1852.—3rd Moss Rose; was sold to go to America, after winning first prize at Bristol as best heifer calf.

1853.—King John, red, by Waterloo, the old cow's grandson. This bull won ten prizes, and was sold to Mr. Cowley, near Daventry.

1854.—White heifer (never bred), took the first prize and silver medal at the Smithfield Show in 1857.

1856.—Red and white heifer, took the first prize at Worcester, as yearling heifer, 1857.

1857.—White heifer calf, smothered in calving.

YOUNG MOSS ROSE, by Lottery (4280), calved Dec., 1841, was not exhibited in early life, as she produced a calf (by her own sire) at 2 years and 3 months old. She went to Cirencester, Gloucester, Chippenham, and Bristol with her offspring, and won at each occasion, in all about £40.

PRODUCE.

1844.—Roan heifer Elegance, by Lottery (4280), was perhaps the best breeder of the tribe. She produced three females by Red Duke, all of which were excellent—first, Red Duchess of Gloucester 1st, still at Broad Hinton, has won many prizes, and is still breeding, having lately produced her seventh calf; then, 2nd Duchess, sold to Mr. Logan, Wales, has been most successful as a prize-taker and breeder; and Duchess of Glo'ster 3rd, of which a portrait was given in the *Farmer's Magazine* for November, 1857, won many prizes and medals, including two gold ones.

Young Moss Rose has bred fourteen calves, nearly all of which were successful at local shows, and one heifer took a prize at the Paris Exhibition Victory, a two-year-old bull from her, has already been a winner of twelve prizes.

PLATE II.

THE DOG IN THE MANGER.

At that very pleasant meeting, of the Sparkenhoe Farmers' Club, we have witnessed one or two decided novelties to the customary proceedings of such associations. First, and best of all, the ladies not merely honour the show with their presence, but the dinner also; while in the programme of the day we come upon a class that in all our peregrinations we have never seen at any other gathering of the kind. There was a prize for Shepherd's Dogs, and some half-dozen or so entered for it—ranging from the useful bob-tailed breed to the more graceful-looking colley. The judges went for the latter, but we do not know "the points" upon which they would decide. However, Stoutness, Courage, Instinct, Shape, and Temper should be the chief recommendations of such a servant, and the last not

the least of these virtues. Either about a house or a flock, a bad-tempered dog is a sad nuisance. He over-worries the sheep in getting round them, frightens the children whenever he meets them, and keeps the stock out of their own proper rights and places. "The Dog in the Manger" is just such a surly cur, with not even the excuse of minding his master's coat, for his inhospitable challenge to that wonderfully well-painted grey horse. But no doubt Pincher gets his dues in time—a mild rebuke administered on the point of a hob-nailed boot, a crack over the head with a hedge stake, or a dig in the side from a much-enduring Hereford. Everybody, in short, is ready to give him a bad name, and one adage may so correct the other.

LONDON, OR CENTRAL FARMERS' CLUB.

STOCK FARMING ON STIFF RETENTIVE SOILS.

The Monthly Discussion Meeting of the Central Farmers' Club took place, on Monday, December 5, at the Club-house, Blackfriars. There was a very full attendance of members. The chair was taken by Mr. T. Owen, of Clapton, Hungerford. The subject for discussion, introduced by Mr. R. Bond, of Kentwell, Long Melford, Suffolk, was "Stock Farming on Stiff Retentive Soils."

After a few opening remarks from the Chairman,

Mr. BOND rose and said: Mr. Chairman and Gentlemen,—As a body of business and practical men I know we meet here not simply with the philanthropic notion to advance the agricultural interests of the kingdom generally, but we meet here feeling that our own individual interests are concerned; feeling that here we may learn something which will be to our own individual benefit; something that will instruct us to increase the per-centage of our own individual returns; something that will cause us either to lessen our cost of production or to increase our pecuniary gain; something that will make the pounds, shillings, and pence of practical farming less difficult. I know that it is with feelings akin to these I always enter this room; I know it is with feelings akin to these that I read your monthly discussions; and I know it is by improving our own individual practices that we shall best promote the agricultural progression of the kingdom at large. Anxiously as we long for agricultural advancement, we cannot afford to be all patriotism. No. 1 must stand foremost; and however little or much you gentlemen may have shared in my feelings of self-interested motives upon your attendance here, yet I am convinced the agriculturists of the kingdom have appreciated your exertions as embodied in the London Central Farmers' Club, and the agriculture of England has been greatly benefited by your discussions. I know from my own experience and personal profit that your efforts have not been in vain. I am convinced thousands and tens of thousands have gathered many a useful hint from the expression of your opinions and the revelation of your practices; and if any man in the United Kingdom doubts the individual benefit to be derived from your free discussions, I advise him to stand in the position of an introducer of one of your monthly subjects, and I will venture a thousand to one he leaves this assembly a wiser and a better man. My observations this evening must be considered to apply generally to clay lands, but especially to those soils of a stiff retentive character in Suffolk, Norfolk, and Essex. In my remarks upon the stock farming of such districts, I will not lose sight of the profit or loss of the question; I will give you my experience; I will freely tell you wherein stock farming has answered my purpose, and wherein it has failed to answer. I propose, first, to show that injudicious stock feeding and stock farming may be a losing speculation. Further, that an entire dependence upon the corn crops for all the pecuniary returns, without stock farming, is unpaying. I propose, also, to consider the present condition of many farms in districts with a stiff retentive soil, relative to stock, and to give you my experience in lamb rearing, sheep grazing, rearing and fattening young beasts, fattening old beasts, cow and pig keeping, and horse keeping. I know stock farming has been so generally applauded of late that one might presume it to be an agricultural short cut to riches—a certain highway to wealth under any circumstances. We hear much that there is nothing to be done without stock, that stock must be the mainstay of the farm, that "without stock no manure, without manure no corn;" and all this I fully believe and subscribe to in a mitigated sense; but at the same time it has been my experience that all stock farming does not pay; it has been my experience that stock farming, on stiff retentive soils, must be carried on with judgment, or it will not pay; and it has been my experience that buying dear beasts, feeding them on dear oilcake and expensively-

grown roots, may be a very losing game, with wheat at 40s. the quarter. Manure, of course, is one main point. I have heard many a man of spirit grumbling upon his heavy loss in bullock grazing, yet in the same breath declare he cannot and will not pretend to farm without good rich bullock muck. With such men, I must admit, I have no feeling in common; for though I prize the manure as very valuable, I am well aware gold may be bought at too dear a price, and that expensive manure may be produced by a very unprofitable process. If there is a heavy loss in the manufacture of the article, I think it very questionable whether ulterior results in the production of corn will repay the first cost sacrifice. I am a great advocate for stocking a farm to the utmost of its capabilities, but I want a direct profit upon the animals reared or fattened, as well as an indirect return in the growth of corn. I want a clear balance in hand, after deducting the expenses of food and attendance. I do not like such items in the stock account as the following, viz:—

DR.	CR.
20 beasts at £15 £300	Sale of 20 beasts at £20 . . . £100
Cake, corn, & attendance 112	Loss 120
12 acres of mangold at £9 10s	
Total cost £520	£520

There has been many a stock balance sheet in Suffolk of which this is a *fac-simile*, and the consequent cost of the manure from 20 beasts is £120, or, as it is more commonly expressed in the eastern counties, "I am just paid for the artificial food, and I have the muck in exchange for the mangold consumed and for attendance." And what amount of muck? Probably just about as much, or but little more, than produced 20 acres of mangold in the preceding year, and which will now in its turn be used to produce 20 acres in the following season. Gentlemen, this is a slow way of getting rich. The system might answer in times of extreme high prices, but it does not, cannot, and will not answer at the present time. We must have direct profit from the animals we feed. I have heard men for the past twenty years vowing they will never fatten another beast; yet, as October or November comes round, you see them buying fine old beasts in the market, under the annual impression that this year's beasts must pay. You hear the old question, "What can prevent meat from being very dear in the spring?" I have lived long enough to see that this is a periodically recurring semi-mania. In the average of years, bullock grazing, as practised in the eastern counties, does not answer; and whether men take to it willingly or unwillingly, whether they do it by choice or necessity, the sooner they alter from a losing speculation in practice the better for the condition of their pockets and the position of their banking accounts. I know well that buying old beasts on Norwich Hill or elsewhere at £15 or £20 a-piece and upwards, and feeding them expensively, may assist to make many a man poor; but it will never make one man rich, with cake at £10 10s. per ton, and wheat at 40 per quarter. I don't want to take isolated years, but yet I must ask what were the profits from winter grazing last year? We all know it was a ruinous "get up." With dear beasts in the autumn, disease throughout, expensive food, and comparatively cheap meat in the spring, the losses were extreme. The average loss was not less than 30 per cent., and I know of different cases in large sheds of beasts where the loss exceeded 60 per cent. The facts of the case are these:—For years past we have had an over-taxed demand upon the supply of lean cattle; only take the prices each recurring autumn on Norwich Hill. The amount demanded per head has continued so extreme that the general pass-words from grazer to grazer have been, "How dear they are asking for beasts to-day," and the result has proved that the rearer of beasts has pocketed the profits, however large or small, and the fatterer has found his grazing in-

vestment a losing speculation. It is quite clear that the supply of lean beasts has not been equal to the demand, and a very high price has been the consequent result; this fact is explainable by reason. The agriculturists of many hitherto purely rearing districts in Scotland and England have become fatteners of a part of their animal produce in addition to rearing, whilst in other cases sheep husbandry, has supplanted the system of calf breeding and rearing. These causes have operated to curtail the adequate supply; whilst our fattening districts, such as the eastern counties, have gradually produced an increased acreage, and a greatly increased quantity per acre of roots, especially of mangold wurtzels; therefore, with a restricted supply and an increased demand, we have been buying lean cattle at a dearer rate than we could have reared them; and I think the unsatisfactory nature of our position calls for the serious consideration of the agriculturists of the eastern counties, viz.:—Can we do better than purchase old beasts at a high price, subject to much disease, fattened at great cost, and resulting in the average of years in an actual annual loss in the transaction? I say, can we do better? What are our future prospects? With England's wealth and prosperity we have, and we must continue to have, a meat-consuming population. The consumption, too, will unquestionably increase. Cheap bread, with an abundant demand for labour, will render the cotton spinner, the artisan, and the well-to-do labourer even greater meat consumers than heretofore. The price of animal food is at this time dear, when compared with wheat; and meat will probably remain disproportionately high in price, in comparison with wheat; but the heavy-land farmer in the eastern counties requires to be in a position to profit by such advantages, by such high prices, and not annually to throw away his chance of remuneration in an extravagant purchase of the beasts of the rearer. I know the system of buying beasts and fattening them at considerable cost has long been the practice in Norfolk, Suffolk, and Essex; but time and circumstances may have invalidated the soundness of the custom, and rendered the position untenable. It is well, for us at least who are interested, to investigate the matter; and do not let us cling to the notion that things will change—that "a good time's coming"—when there is no reasonable ground for such a conclusion. Lean beasts have long been at too high a price; and though we may have fluctuations, yet there is every chance of lean beasts remaining at too dear a figure for profit to the grazier in the average of years. I am no man for clinging to a sinking ship, to an unpaying speculation; and the course which would answer for producing corn by expensive manure at 70s. per qr. will not do with wheat at 40s. per qr. Let me clearly see that any course is wise and prudent, and I am a willing disciple; but I am not prepared continuously to rush into the quick-set fence of bullock grazing blindfolded, and then annually awake to the unpleasant fact that I am in a very uncomfortably losing position. We must remember, further, that years since, with cheap wheat we had cheap oilcake; but now we have cheap wheat and dear oilcake, which makes our position even more untenable; yet notwithstanding I meet with merchants who assure me they are doing a good business at £10 10s. per ton in oilcake. By no rule of arithmetic can I reconcile this outlay of the grazier to any extent with common sense under existing circumstances; literally with wheat at a far cheaper rate, and I believe it is a better fatterer than the adulterated or even unadulterated oilcake of the present day; yet men are to be found who invest in cake probably to produce wheat, which is cheaper by 20 per cent. as a first cost than oilcake, the means taken to produce it! I say this may be custom, but it cannot be wisdom; we are creatures of habit, but our habits may be very unwise. Stock farming, then, may be very unprofitable; but again, to go to actual facts, an entire dependence upon the corn produce of the farm will not do. We hear men continually complaining that the sole reliance upon the barn doors for every penny will not answer, and they are quite right. Which portion of the agricultural community suffered most during the depression preceding the late Russian war? It was the cultivators of the clay districts whose lands yielded corn crops, but no animal produce. This truth admits of a reasonable explanation; for whilst wheat fell in price 30 per cent, meat but slightly receded in value; and the relative prices are the same at the present time; meat is dear compared with wheat, consequently meat must be produced. We have long since condemned the practice of bare fallow; we have strenuously urged the cultivation of roots, but we don't

require a profitless root crop; we want a direct-paying vegetable produce, and I think it both feasible and possible to secure it. But before attempting to demonstrate a remunerative method of stock farming on stiff retentive soils, I should prefer to glance at the actual position of many such farms relative to stock farming at the present time and for years past. Some occupants of the clay or loamy districts have a very summary process of stock farming; they grow no amount of vegetable produce, and consequently require no stock to consume it. This, under special pecuniary circumstances, in different cases, may not be entirely apart from necessity, for the "heavy land" districts of the kingdom have never been noted for a galaxy of wealthy owners or occupiers, nor has the soil ever been notorious for its wealth of producing powers. Is it this description of soil which our agricultural millionaires take through choice? Is it here we meet with our Hudsons, our Crisps, or our Mills? Is it here we meet with large occupations and vast investments? Is it here we meet with farm houses as mansions, and a princely hospitality? Is it here we meet with the well-to-do groom, and the well-conditioned hacks and hunters? Is it here we meet with first-class stock, model homesteads, and superior farming? We know 'tis money which is the main spring of progress, and we must confess to the fact that the clays of England do not command the wealth of England. To many a spot could I take you, where the farmhouse of the small occupant is a cottage, the buildings are rubbish; where a clearance fire would be a general benefit; where the farm is a succession of corn fields and bare fallow; where stock is the exception, and not the rule; and the tenant, though all kindness, is far from being all intelligence; and he is both literally and figuratively "a man of straw." I know clay and water are not very inviting for investment or occupation; but if the proprietor is too poor to build suitable buildings, if the tenant is too poor to grow roots and to buy or rear suitable stock to consume them, I can say nothing to such an improvement, but I recommend the one to sell and the other to quit, and make room for better men. I advise it, because in these days of competition there must be adequate investment for adequate return, and to neglect outlay is but to go to the dogs by degrees—the landlord to repossess a whipped, a jaded, and worn-out farm; and though the tenant may keep himself from the workhouse, and exist in fustian and subservency, he will require no man to make out his will, as it is now the law of the land that every man desiring to bequeath should have something to devise. We may settle it, then, as a fact, that no stock at all is not profitable stock farming; but there is yet another phase of the class of heavy land farmers to whom I would allude: I mean the man with sufficient means; and there are many such, with stock of a doubtful character—so doubtful in quality, that early maturity, aptitude to fatten, symmetry, and shape, would appear to be undesirable qualifications. I now know of many such inferior, ill-made, coarse-bred animals; I have even tried them, and I still have two or three young beasts to test the truth of how much good food may be thrown away and wasted to manufacture one stone of ordinary beef. These animals of which I speak, especially, are often the produce of an ordinary cow, and of the nearest bull in the neighbourhood; there are other beasts of the old Irish character and the like, but I will warrant each specimen, one and all of them, as a sure and certain preventive to grazing proving a profitable investment in their individual cases. I should like to see the balance-sheet of but one trial; and if men more fully calculated the cost even of their successes, they would be more wary of future attempts. It would be a case of "once bitten twice shy." Don't think, gentlemen, that I am ignorant of the vast improvement which has taken place in the stock of the kingdom within the last 20 years; don't think that I am blind to our exalted national position in animal productions. Our Royal Agricultural Exhibition, our Smithfield Club Cattle Show, and the local exhibitions in the country generally, are evidences of the perseverance, the indomitable perseverance, and triumphant successes, of the middle classes of England, combined with instances of aristocratic assistance in animal culture. No other nation in the world possesses such general comparative perfection in animal symmetry; and I but complain that such improvement has not reached every occupation—that men are still to be found who attempt to fatten those cattle which have no disposition to fatten; and, when prepared for the butcher, have much offal, but little prime meat, and entail heavy losses upon the grazier. I have shown different attempts at grazing, and certain neglects

of grazing, which can answer no man's purpose; but I am well aware there are many heavy-land farmers of excellent business habits, of shrewd penetration and judgment, and of ample capital, whose management will bear comparison with the best farming in the land. With your permission I will proceed to relate the course I have pursued, and the reason why I have acted as I have in my stock management. It will, of course, be necessary for me to be rather egotistical; but I must admit I can see no good reason why we should all be so extremely modest as to fear the use of those personal pronouns I, or we; for I stand before you not in the spirit of infallibility, but I stand here to tell you the course I have pursued; I stand to relate my experience, that you may in a kindly and friendly spirit criticise and censure my practice in any way you please. I know well that different circumstances as to the price of food allow and compel a different course of procedure in feeding. I know too that a variation in the relative value of stock entails a variation in practice; but I shall speak of the present time, of the past five or six years, and under existing circumstances. Above all, I trust you will bear in mind I am treating upon stock farming on stiff retentive soils which require drainage. I have shown that buying old beasts at a dear price, and fattening them expensively, does not answer; that all grazing does not pay; I have shown that the system of all fallow, no root crop, and no amount of stock, will not do; and I have shown that, attempting to fatten that which has no disposition to fatten, is a mistake. It was with an experience akin to this that I undertook the management of 600 acres of arable and 200 acres of pasture land, in round numbers, in 1853, in Suffolk—it was land requiring drainage; the pastures especially were wet, cold, and unproductive; it was land upon which no sheep had been kept except some two or three score in the summer months, and it was considered the soil was unsuited for sheep; it was considered madness to institute sheep, notwithstanding we established a flock of 25 score, or 500 ewes. We at once drained both plough and pasture, adopted autumnal cultivation, put aside the bare fallow system, cultivated mangold wurtzels and swedes, and we have since been able to rear 650 lambs annually, to fatten out an average of 40 beasts, to rear an average of 30 young beasts, to fatten an average of 10 score of sheep, to keep 15 cows, 15 colts of different ages, and 30 horses, and an average run of pigs. Now, I consider there is nothing extraordinary in this, though clay land, and although at the commencement much out of condition; but the secret has been large and increasing breadths of mangold wurtzels, till this year, upon the four-course system, we have extended the breadth to a hundred acres, which at an average of 30 tons per acre equals 3,000 tons of good valuable food; and in our eastern counties exceeds by one-third the produce of swedes, and the mangold wurtzels have superior fattening qualities. Independently of our permanent course in keeping a flock of breeding ewes, we have varied our system of grazing, generally buying calves, rearing and fattening them for sale at two years old; but if beasts in good fresh condition have promised to be beneath the value at which we could rear them, we have then purchased beasts in the autumn, or in the spring, when partially fattened; or if beasts have been dear, and sheep proportionately cheaper, we have then fattened sheep in yards instead of beasts. We have endeavoured to carry out the principle of buying the most paying article in the cheapest market, and to secure the largest amount of profit. After every trial we pronounce greatly in favour of the flock of 500 ewes, as the most paying; and from the improved condition of the land, the number of ewes might now be advantageously increased from 25 to 40 scores; and I believe such an increase of the flock to be the best remedy against the present depression in the price of wheat. Last year the produce of the 500 ewes realized, for 600 lambs sold in August, £884; 61 tons of wool, £144; total, £1,028 which exceeds the rental value of the land. This year the produce of the flock, viz., 650 lambs, and 60 tons of wool, which realized £970; and in other years the return has been in the same ratio. We have gradually been substituting Hampshire ewes for Southdown ewes; and we have crossed either with Cotswold tups, hired of Mr. Sexton, of Earl's Hall, Cockfield, Suffolk. We have found that mutton and wool answers infinitely better than breeding and blood. Size and frame are necessary for early maturity, and we have no notion of small pretty lambs, which cannot command a ready purchaser. We made trial of some pure bred lambs, by selecting a few of the best Southdown ewes, and placing with them Southdown tups hired from the best flocks, but the pro-

geny were very unpaying, even allowing that they consumed less food when compared with the lambs of the first cross. The Southdowns are, undoubtedly, admirably adapted for downland and a short herbage, but not for the soil or the system which we have pursued. In the management of the flock, from the ewes being the scavengers of the farm, they are kept inexpensively; but they are always maintained in a sound, healthy, thriving condition; and one main point is, to have them upon the arable land as much as possible, because of the manure, but never at a wet or improper time. In October the ewes are placed in different lots upon the maiden layers and stubbles generally, whilst the tupping is going on; also upon the mangold wurtzel tops, after the roots have been carted. In November they have the swede tops, perhaps a piece of rape, also the pick of the old grass on the pastures, and, as the weather becomes wet and cold, they are taken to two good, roomy, well-drained, well-shedded yards, where they receive cut barley, oat, pea, bean, or wheat straw in troughs, also a supply of any clean, fresh-thrashed straw, placed between hurdles, or in racks, from which they eat the straw most freely. I have been astonished at the amount they will daily consume. Those yards become their winter quarters. They are littered with straw as necessary; and I have always noticed in coarse, wet weather, upon entering the yards early in the morning, that every sheep is under cover in the sheds, which simply proves that they are as great lovers of comfort and warmth as the human or any other animal. We adhere to the yards in the winter; as ewes folded at night upon a bleak field, exposed to severe frosts, cold cutting winds, rain, sleet, and snow, are in a poor position for progress; and we prefer to cart the manure to the field in a dry season, rather than to deposit it there under such unfavourable circumstances to the animal and to the soil. Each day the ewes have gentle exercise, or a free ramble upon an adjoining pasture, where they receive an allowance of 100 bushels of swedes or mangold wurtzel per diem. This treatment is continued till within a month or five weeks of lambing, when a few bushels of crushed rapecake are daily added to the straw chaff, which cake we consider may advantageously be passed through the animal instead of applying it direct for a grain crop to the soil. The rapecake is always eagerly consumed; and even such inexpensive artificial food is very beneficial in preventing too great a reduction in the condition of the ewes prior to parturition. About three acres of cow cabbage are grown, some of which are given to the ewes 10 days previous to lambing, or they have a small bait upon aftermath grass, which assists to ease in parturition, and secures a flow of milk. After lambing, the ewes are placed with the lambs upon a piece of aftermath grass, which has been reserved, where they receive mangold wurtzels and cabbages, and return to the yards at night for rapecake and cut roots with straw chaff, till the weather becomes sufficiently warm for the lambs to sleep out, which is not usually till April. The lambs are allowed cabbages, and a small supply of bean meal and rape or oil cake, apart from the ewes. In May or June the flock of ewes and lambs receive mangold wurtzels upon the rye or rye grass or pasture, the lambs running forward for the best feed; after which, in July, the lambs are weaned, and placed upon good clover or pasture, where they continue to receive a small supply of artificial food, and are sold usually at the commencement of August. After weaning the lambs, the refuse ewes are withdrawn and fattened; whilst the flock ewes are shifted to inferior food, and gradually prepared for the following tupping season; they are allowed a fold of tares or rape, or second crop of clover, in August and September; and have the run of some pastures, also the stubbles, after harvest. Now the advantages of the system are these—the ewes are treated as the refuse consumers of the farm; they are kept in a healthy condition, but they are kept inexpensively. They subsist in the autumn upon the stubble feed and root tops mainly; upon straw chaff and straw, and a small portion of roots, in the winter; in the spring they consume straw largely, with rapecake and roots; and in the summer months green food is plentiful. The return is, as I have shown, nearly £1,000 per annum, which will allow of some expense in the giving artificial food to lambs; and such a system of lamb-feeding answers admirably. I can observe, that it not only improves the lambs generally, but it prevents a number of refuse lambs, which usually make but a poor return. I think food thus given pays 10 per cent. beyond the improved value of the manure. I can find, further, by having the ewes off the land in the wet weather

of winter, and upon it when dry in the autumn, spring, and summer, the farm is much improved. I can always observe the marked superiority of the wheat, and other crops, from the folding. I can notice that poor heavy land pastures are much fined and improved, even beyond the advantages arising from draining, by sheep-feeding; the herbage is thereby fined and much thickened; but I recommend that the ewes be folded upon the arable and not upon the pasture, and that muck be applied to the pasture in some cases instead of the ploughed land. Such an exchange I have found very beneficial. I would here remark that the dry food of winter much assists to a healthy parturition, although many of the lambs are large, and weigh when born from 12 lbs. to 16 lbs. When, from the cheapness of turnips upon good feeding ground, we have left home with the flock to consume the turnips at a nominal price, we have been considerable losers in an increase of deaths, both of ewes and lambs, at lambing. I know it may be objected that animals consuming straw largely are but poor manure makers; but this is no valid objection; for if we can make a good pecuniary profit by the system, we have money in hand with which to enter the manure market. Further, the lambs and ewes consume some artificial food; and by economy of straw, with other stock upon the farm, in stall-feeding beasts and box-lodging cart-horses, the spare here made will suffice for the straw for the ewes, and a much larger quantity of stock can by this system be kept. We were once troubled with the foot disease in the flock for a few weeks, but never to any extent, and we quickly ridded the complaint by proper treatment. We have purchased ewes, two and three shears old, annually, at from 40s. to 44s., and upon this method of treatment they will rear lambs for three or four years. We then fatten them as crones to the value of from 44s. to 54s. per head. The following is my calculation of expenses, and the actual balance-sheet of out-goings and returns:—

Attendance	£40 0
Autumn quarter at 5s. per week per score, 13 weeks	48 15
Winter quarter at 5s. per score per week	81 5
Spring quarter at 15s. per score per week	243 15
Summer quarter at 10s. per score per week	162 10
Interest	50 0
Loss	50 0
Tups	60 0

£736 5

I have placed all the food at cost price; and the calculation is based upon the crones being fattened out at the value, and at the same time that the stock ewes are bought in, consequently 50*l.* is placed for deaths of ewes, which the loss has not exceeded; consequent gain in '57, after deducting 736*l.* 5s. (the cost), from 1028*l.* (the return), 291*l.* 15s. profit. In '58, 736*l.* 5s. (the cost), deducted from 970*l.* (the return), 233*l.* 15s. profit. Now such profits, with the additional value of the manure, are, I think, worthy of consideration; and I advocate a flock of ewes, in preference to fattening sheep, because the poor quality of the land, and of the produce of heavy land generally, is much better adapted for a breeding than for a fattening flock. I believe lamb breeding the most paying course; and in the light land districts the flock has always been the mainstay of the farm; then why should it not become so upon many a clay land occupation? I believe the system may be advantageously carried out where not even one tenth of the farm is in pasture. Where no pasture exists, and if necessary, instead of pursuing the four-course system, why not allow the land with clover to remain two years instead of one? thereby making a five-course system of it in preference to the four-course shift; and with good folding, which the clover land would receive after the first year's mowing, and then the second year's feeding, it would be in excellent heart or preparation for the following crops, and furnish an abundance of feed and space for the ewes. Ever since I can remember, I have heard increasing complaints of the loss in the eastern counties of buying old beasts, and fattening them out; but I never yet heard one complaint against ewes, or the system of flock farming. I know many a man may possibly say, "Well, I'll try a score ewes, and see what they will do;" the consequence is a few are as much trouble as the many; and unless the breeding is made a prominent feature of the farm, with a lad or shepherd properly to attend to the ewes, the trouble of the few, being every one's care and no man's direct charge, exceeds the advantage, and they become a source of petty

annoyance rather than of profit. I therefore recommend any gentleman disposed to pursue the system, to arrange his resources, and commence with a proportionate number of ewes to the size of his occupation, whereby the prospect of a remunerative return will make it worth his while to take suitable care, and to pay the necessary attention to the flock. Upon the subject of lamb rearing, and the management of ewes generally, on stiff retentive soils, my friend Mr. Goodwin thus writes to me. Mr. Goodwin now farms light land, consequently he writes in the past tense:—

"Covehithe, Nov. 29, 1858.

"My Dear Sir,—In reply to your letter of yesterday, respecting the keeping of breeding ewes upon stiff land, the plan I pursued for many years was this—to give three bushels per score per day of any description of roots, upon a stubble or meadow near the yard; where I nightly put them to straw in racks (not laid out, to be trampled upon and dirtied) of any kind of barley, pea, bean, or wheat straw—the last the worst. About three weeks before lambing I gave more roots, and mostly half a-pint of beans each, or as near as I could estimate that quantity or value of barley in straw, if the latter was very cheap. I forgot to say my ewes generally went upon this keep about the third week of November, varying according to weather. After lambing, my twin ewes went to old grass and roots in the daytime, and each night into yards to stubble and corn, until layers were ready, when I threw roots into fold for ewes, the lambs running forward. I need not say the singles caught the worst fare. I do not know of anything further likely to be of advantage to you, except this—my lambs were generally a good crop, and made, as you are probably aware, a good price in the third week of June. I remain, dear Sir, yours truly,

"S. C. GOODWIN."

I have in different instances fattened 300 of the produce of the flock in sleds and yards during the winter, and sold them the following spring as hoggets. In some cases I have fattened purchased sheep, either of which I have divided into small lots of 15 or 20, by partitioning the sheds; and when I have been short of straw, or the manure has accumulated under them to become hot to the feet, I have found a small casing to the ard of two or three inches of sand very serviceable, as absorbing the liquid in the manure, consolidating the muck, and preventing injury to the feet of the animal by heat or moisture. The manure thus made has always proved remarkably efficacious. I have given the sheep a small supply of the cheapest artificial food in the market, with cut mangold wurtzels and chaff. Sheep have paid me even for grazing better than beasts. Sheep grow wool, in addition to meat; they have a smaller proportion of offal to beasts; consequently, less food goes to waste, and the price of mutton is usually $\frac{1}{2}$ d. to $\frac{3}{4}$ d. per lb. in excess of beef; consequently, if a beast does not manufacture a larger amount of meat from a given quantity of food than the sheep, then it is clear, by the light of reason, under such circumstances—the meat higher in price, a smaller proportion of offal, and a penny to add to each pound of meat for the wool produced—I say, under such circumstances, it is clear, by the light of reason, that the sheep must be the more profitable of the two classes of animals—and such has been my experience. At the same time I would add, I have never yet found sheep grazing equal to lamb rearing on stiff retentive farms. My opinions and conclusions upon the age of the beasts to be grazed vary considerably from the principles and practice generally adopted. I observe numbers buy old beasts for fattening, or they purchase young beasts, and keep them 12 months upon straw, and roots, and pasture, and fatten them the succeeding winter. Now, my experience has been that, although young beasts will not fatten so fast as older ones, yet their assimilation from a given amount of food is greater; they extract more of the nutritive matter, and convert it into muscle, fat, and bone—in plain terms, they manufacture a larger number of pounds of meat from a ton of mangold wurtzels, or any other food, than the older or full grown beast. The inferiority of the manure from a growing beast is a proof of this, when compared with the excrement of the full-grown animal. You may say much goes to form bone; but it must be remembered, although a superfluity of bone is undesirable, that we sell bone as well as meat to the butcher, and the butcher to the public; and the more rapid the process of rearing and fattening to early maturity by judicious feeding, the less the waste of food. It never can be wise or

prudent, in these days of rapid returns, of artificial food, of early maturity, and improved breeds, to grow flesh and bone by one process and fat by another; it never was desirable to make "two bites of a cherry;" we do not grow straw by one process and corn by another; and I believe, nationally, we are wrong. I believe it is against the interest of the kingdom, and of the agricultural community, to mature a beast in four years, which could with greater profit be matured in two years. It is only in accordance with reason that bone, muscle, and fat manufacturing should be proceeded with at the same time. We now mature our sheep very young, even killing them as hoggets at 12 or 15 months of age, and they attain to a prodigious weight and size. Early maturity in sheep grazing is justly considered one of our modern improvements; and why, in practice, is not the principle applicable to beasts as well as sheep? I have fattened animals of different ages; and I have found that beasts fattened when young make the best return, and pay the largest amount; they not only swell, but they grow into money, and fatten at the same time. With animals which I have purchased from Buckinghamshire as calves, and which I have commenced to fatten at 18 months of age, and sold at two years old, they have averaged 50 stone of 14lbs. each beast; when, had I given them another year in the straw yard and at pasture, they would not have exceeded, when fattened, 60 stones in weight; consequently 10 stones at 7s. 6d. per stone £3 15s. would represent the amount of pay per head for one year's keep, and I think it but a low figure, and poor remuneration for 12 months' feed. The following is an actual balance sheet of calves reared and fattened, and sold at two years old; and I give it simply to show that by proper economy in feeding, manure may be made without an actual loss in the average of years, even by beasts, and to prove that beasts will just pay for the roots and food consumed. Rely upon it, judicious feeding, not the old-fashioned system of cramming, is the secret of success in making the root crop pay; the object desired must not only be attained in a given time, but it must be secured at the cheapest cost:—

DR.		BALANCE SHEET.			
First cost of 20 well-bred shorthorned calves...		£40	0	0	
Month.					
1	Milk, hay, tea, and artificial food, 4 weeks × 2s. the week per head ...	8	0	0	
2	Mangold, hay, and meal, 8 weeks × 1s. 6d. per week ...	12	0	0	
3					
4	Grass and meal, and chaff, 20 weeks × 1s. 6d. per week ...	30	0	0	
5					
6					
7					
8	Mangold and chaff, and meal and chaff, 20 weeks × 2s. per week ...	40	0	0	
9					
10					
11					
12	Ditto, ditto, 12 weeks × 2s. per week ...	24	0	0	
13					
14					
15					
16	Grass, at 2s. per week, 16 weeks × 2s. per week ...	32	0	0	
17					
18					
19					
20	Mangold and chaff, and meal and chaff, at 7s. per week 24 weeks × 7s. per week ...	168	0	0	
21					
22					
23					
24					
25					
26					
Profit ...		£354	0	0	
		21	0	0	
		£375	0	0	
CR.					
1000 stone of beef, at 7s. 6d. per stone of 14lbs.		£375	0	0	

The mangold wurtzels are charged at £9 per acre, the meal at 9d. per peck, the hay and grass at current prices. Now, I am aware that this profit of £21 beyond the cost of the purchase—the milk, corn, root, grass, hay, and attendance—simply provides against casualties; and in these times of disease it must be remembered the risk is much less with animals well cared for, and well fed throughout, than with those beasts exposed to hard fare and hard weather, to the extremes of heat, and perhaps the vitiated air of a steamer's hold and the extreme of cold in a railway truck. It must further be remembered that if the profit is small, the prime cost of all consumed by the animals is paid for, and the muck is free of any expense beyond the cartage to the field. I am convinced rearing calves and grazing young beasts, though entailing trouble, is a safer, more paying, and less hazardous system than buying old beasts. I am convinced it is right in principle, and I have found it better in practice. I will now consider the question of buying and grazing old beasts. I am convinced it must be right individually and nationally to produce the largest amount of meat from a given amount of food. And for one man as rearer to adopt a feeding process for two or three years to grow the animal, and another man as grazer a feeding process for one year more to fatten the animal, as is often the case, must, in these days of early maturity, of quick returns, of improved breeds, and artificial foods, be contrary to those principles of economy in time, and economy in consumption, which it is desirable for us to cultivate and carry out in practice. If the two—the rearer and grazer of old beasts—were mutually benefited, who would have cause to complain? It would be a mutual advantage; but when it has grown to this, that the rearer has always the best end of the stick, and pockets the total profits, however small, whilst the grazer has none, either with dear beef or cheap beef—I say, when the mutual advantage has so entirely ceased, it is high time for the sufferer—the grazer—to seek his own remedy in a change of system suited to his occupation, and possessing the promise and prospect of remuneration and profit. I should like but one old bullock buyer—but one high bullock feeder in the eastern counties, to come forward and prove by his balance sheet that grazing has admirably answered his purpose. If such an one there is, he is a rara avis indeed; and though I know not the one who has profited, I know well the ninety-and-nine who are losers, and much "over the left" by the practice. In grazing old beasts purchased at recent prices, pecuniary loss has been my experience; complaints and accounts from private friends give a concurring testimony; and when I examine published statements, I can find but little recorded profit, and much positive loss. We are all creatures of habit; and in the eastern counties we have so continuously purchased and fattened beasts, and mainly supplied the metropolitan markets during the winter months, that "what has been must be" is too much our course of procedure, without an effort of thought or of action to effect a change. This observation is especially true when applied to a system of long continuance and of general practice. "What else should I do?" "every-one does the same," are the sedatives and narcotics of an unpaying system; and men are often at ease to share a misery or loss with their fellow-men which they could ill endure isolated and alone. I know many will say, "I must stamp my straw down." I reply, by all means; but do it at a profit! If you are content to do it at a loss, I am not the man to swim with you; if we are satisfied to do badly, we shall never aspire to do better. I think, with present prices and present prospects, the old bullock grazing shoe has gradually contracted to pinch a little too tightly; and I am glad to have the opportunity of calling the attention, especially of my brother heavy-land farmers, to the subject in the eastern counties, and I simply ask each man to revolve and re-revolve the question individually, "Am I doing well? and can I not do better?" An intimate friend of mine, a farmer of 400 acres of stiff retentive soil, has practically answered this question. He had bought beasts, and fattened them, and lost money in the transaction, for a few years, till the following balance sheet in his experience caused him to search for a less ruinous system. The following are the items:—

Dr.		£	s.	d.
Eight old beasts, at £19 ...	...	152	0	0
20 weeks' keep at an average of 10lb. of cake per day, at 1d. per lb....	0s. 10d.			
3 bush. of mangold wurtzel at 2d. per bush.	0s. 6d.			
½ peck of meal, at 4d.	0s. 4d.			
		1s.	8d.	
1s. 8d. per day each beast × 140 days × 8 beasts ...	...	93	6	8
Attendance ...	...	5	0	0
		250	6	8
Cr.		£	s.	d.
Eight beasts sold at £22 10s. each ...	...	130	0	0
Loss on eight beasts, at £8 15s....	...	70	6	8
		250	6	8

The loss of £8 15s. 10d. per head is a slow road to riches, especially when the ulterior result is known. My friend found that the beasts had made 165 loads of muck, which he applied to 11 acres of land, at the rate of 15 loads per acre, and which, with the labour of filling, carting, and spreading, cost nearly £7 per acre—a larger amount than the two succeeding crops realized for the manure applied, after deducting the outlay for seed, rent, rates, tithes, and labour. This was but a poor speculation; but we have heard of worse. I have known beasts realize but the price at which they were purchased at market in their lean state; but, presuming the year to be an average one, and that the popular opinion is realized by the beasts paying simply for the artificial food, still, on the above scale of feeding, at 3 bushels of root per day, there is a loss of 4s. 2d. per head per week, in the cost of mangold wurtzels consumed and attendance, or £4 3s. 4d. per head upon the 20 weeks; which, if each beast has manufactured 20 loads of manure, is 4s. 2d. per load, or 415 per cent. beyond the cost at which younger beasts would have manufactured it; for whilst on the average, as generally allowed, older beasts pay nothing for root crop, I believe, on the average, younger beasts, with economical feeding, do pay for the food consumed, just keeping the Dr. and Cr. account at par, and the manure is thereby secured gratis, without loss in the grazing transactions. I am convinced beasts, at the best, make but a poor return; and my friend before alluded to, who had lost yearly by his bullock grazing, and as an ultimatum lost £8 15s. 10d. per head, was so dissatisfied that he wisely resolved upon a change. He has since gradually given up beasts, and substituted the best riding colts he can purchase, and sheep. He has now each year from 50 to 70 colts by him, which he buys at a range in price varying from £20 to £70. These he fattens in loose boxes, which his beasts once occupied, in 20 weeks, thereby making two returns in the mangold wurtzel season of 40 weeks. The following is the dietary, with the actual cost and results:—

	a.	d.
1 bushel of cut mangold wurtzel, at 2d. × 7 days ..	1	2
½ cwt. of hay at 3s. per cwt. per week.	1	6
1 peck of bran at 2d. × 7 days, with straw chaff ..	1	2
Attendance	0	3
	4	1

Cost for first ten weeks 4s. 1d. per week.

Superior scale of feeding for fattening. In this case boiled wheat is used with good success, and I would here remark that 1 peck of dry wheat absorbs 3 pecks of water, making 3 pecks of boiled wheat:

	a.	d.
1 peck of boiled wheat per day at 4d. × 7 days ..	2	4
¼ peck of barley meal at 2d. × 7 days	1	2
¾ pecks of cut beet at 1½d. × 7 days.	0	10½
¾ cwt. of hay in truss, or cut with 2-3rd straw at 3s. 1 6		
Attendance	0	3
	6	1½

Cost for second 10 weeks, 6s. 1½d. per week.

The result has been that my friend has reaped a clear

profit of 8d. per bushel for the mangold wurtzel consumed, which, if calculated by the acre, is a very different return from his serious losses, at bullock grazing, of the entire root crop, and a little money in addition. The 8d. per bushel includes interest of capital, and deaths or accident. Enough colts are kept to make down the straw of the farm into manure, and it is the number of colts which allows of such cheap attendance. It is of course perfectly clear that such a course of colt grazing is not practicable to any vast extent by any number of men, but it shows what may be done by those who try; and I much desire to see fewer old bullock graziers upon the old Suffolk system—a larger number of lamb breeders, keepers of well-bred cows, rearers of calves, fatteners of young beasts, and colt fatteners on the stiff retentive soils. Prices will thus equalise themselves more advantageously, and the heavy-land farmer will greatly benefit himself by sharing in the profits of his light land neighbour, who in times of depression finds his sheep stock his preventive to loss—his grand security. I will even go so far as to say we are no longer literally dependent upon the animal for manure. We have our artificial manures; and I believe a direct loss upon grazing to the amount of the mangold wurtzel root crop consumed, which costs £9 per acre to produce, is not the most paying course. Even such manure at such a cost is not the cheapest, for although bullock manure is lasting, we must remember that a large proportion of the vegetable matter it contains is given in literally gratis in the shape of straw, which certainly constitutes more than one-half of the manure. Try your pure beast manure without the straw, against pure Peruvian guano at equal costs, and I believe the latter the cheaper, judging by results. Not that I recommend such a course, but I want to demonstrate that some other system than losing by bullock grazing is practicable, and that our best manure, in Suffolk at least, is bought at too dear a price, especially at the present price of wheat. I know it may be said straw is not manure; but I would simply remark that when the lease stipulates that a load or two of straw shall be annually supplied to the landlord, we then hear enough, and a little spare, upon impoverishing the farm and the like by the removal of straw from the occupation of its growth. Cow farming has within the last few years been discontinued on many farms with stiff retentive soils, but it has been my experience that the average of cows at the present high price of butter and cheese pays a clear profit beyond cost of keep, attendance, and trouble, of £5 per cow. Good food ensures a good quality of milk, and an abundance of it. Of nothing must come nothing, and a spare diet is certain to result in a short flow of poor milk. To me it has appeared most desirable to possess such a quality of cow as will not only prove useful and profitable for her milking properties, but such an one as will also breed a good calf if put to a well-bred bull. This is the description of cow to be met with in the best dairy and calf-rearing districts, and I can see no reasonable cause why such a cow should not be applicable to the eastern counties. I mean nothing of a fancy character, but a well bred, well-shaped animal; and though it may be objected that the pastures of Suffolk, or Norfolk, or Essex are not sufficiently good, I think if it should lead to their drainage and improvement it would insure a double benefit—a better description of cow, and better pasture farming. My experience in pig grazing has been, that a sufficient number to consume the waste of the farm are as many as are desirable. I have found that cart horses are most economically kept in part upon mangold wurtzels. We commence feeding them even in October with the best results; and, at the present time, I can meet with no corn so cheap as wheat, for the horse, in connection therewith. The following is the dietary:—

	s.	d.
2 bushels or 5 stones of mangold wurtzel, with chaff, per day, at 2d. per bushel, 4d. × 7 days	2	4
1 bushel of ordinary wheat and grinding given with chaff	4	6
½ cwt. of clover hay at 4s. per cwt.	2	0
Total per week	8	10

Upon such diet the horses work hard, and remain in good condition. Even with the cart horses I am a great advocate for comfort, and much prefer airy, comfortable, well ventilated loose boxes, to the open yard and shed system. The

manure remains under them for about three weeks; from being made under cover it is much better in quality; and comfort is preferable to discomfort to the animal itself. After a hard day's work, quietly to feed and quietly to rest must be more desirable than fighting or being fought from the shed or the feeding bin; and in proof of the healthiness of the system I will here read a letter from the most eminent veterinarian in Suffolk, who has had much experience upon this subject, combined with an extensive practice:—

“Veterinary and Livery Establishment, Museum-street, Ipswich, Nov. 27, 1858.

“Dear Sir,—I am decidedly an advocate for well-ventilated stables for cart horses to feed and sleep in, rather than open yards, although I believe their general adoption would not advance the pecuniary interests of the “vet.” Mr. T. Harwood, Belstead Hall, Ipswich, has had some 18 or 20 farm horses constantly in boxes for the past six years, and to him I would refer you for a reliable practical opinion, feeling sure he would with pleasure give it you—I am, dear sir, truly yours,

“C. T. SHORTEN.”

“Belstead Hall, Oct. 2, 1858.

“Dear Sir,—I am sorry I was prevented replying to your letter yesterday. It is quite correct I have had 20 horses for several years kept in boxes, and from my experience I am satisfied the health of the horses is certainly improved, as Mr. Shorten can testify. I think his bill the year previous to the alteration of my stables was £36, and during the five or six years since it has not been 36s. for the entire period. I think for both food and attendance the cost is more, as they consume less inexpensive food, but the comfort and security is very great. I am fortunately situated in having a constant supply of water in each box. I am not quite certain that the horses make so much muck as when turned into the yard, but it is decidedly better. It will afford me pleasure to show you my stables.—Yours very truly,

“THOMAS HARWOOD.”

In all feeding and fattening of any description of animal it has been my experience that warmth and comfort are equivalents for a certain amount of food. I have found that regularity of feeding and cleanliness are essential to progress. I have always discovered that an extravagant system of feeding is most unpaying; that we require to give such proportions and admixtures that the animal can manufacture the largest amount of meat from a given quantity of food; that an excess of the nutritive is unassimilated and voided in the excrement; that although the manure is thereby improved, it is too expensive to manure with that which should by proper management—by proper admixture in a larger bulk—have been converted into meat. On the other hand, I have found, as every one else has, that an insufficiency of the nutritive in the food causes retrogression, instead of progression. Further, I have always observed that rest and quietude are necessary for rapid progress; that exercise is undesirable. In fattening animals we have an unnatural object in view, in the undue development of flesh and fat; consequently, an unnatural means best secures the ends desired, and exercise under such circumstances is injurious rather than beneficial. If we frustrate nature's purposes, and have objects antagonistic to nature's intentions, we must deviate from nature's prescribed laws of exercise for strength to secure our alien ends. I am, therefore of opinion, and it has been my experience, that fattening beasts ranging at large, in an open yard, lose much of the benefit of their food by waste in exposure to cold, and from superfluous exercise. I have no objection to the loose box system; under certain circumstances, I think it the most desirable course to pursue; but as the beasts in loose boxes stamp away one-half more straw than the stall-fed animals, and again, as the loose box system requires a much larger extent of buildings, which landlords usually are not very anxious to erect, nor tenants to pay a per-centage upon, I think stall feeding both the more desirable and the more feasible system to adopt generally. As to the description of animal to feed, we require healthy, symmetrical, and docile animals; we require animals that will manufacture meat, and not offal; animals that will assimilate food to their own superstructure, and not such as fill the office simply of root pulpers, cake grinders, and manure stampers; we want animals that will

make a return in meat and profit for kind treatment, attention, and good food. I will briefly recapitulate by a summary of the foregoing. I have shown that although stock farming is desirable, yet that all stock farming is not profitable. I have pointed out, that the judgment required for the most profitable consumption of the root crop, for the most paying manner in which to manufacture straw into manure, is something to tax the observation and attention, and that it requires no mean powers of discrimination. I have shown that an unpaying and unprofitable root crop will not do; that no roots and no stock and an entire pecuniary dependence upon the barn doors will not do. I have shown that stock farming with ordinary stock is very unpaying; that extravagant feeding in stock farming will not answer directly or indirectly. I have shown by my own experience, and the experience of my friend Mr. Goodwin, that lamb rearing is practicable and profitable on heavy land, and that it is the most paying course. I have shown by my own experience that sheep fattening is practicable and next in profit after lamb rearing on stiff retentive soils. I have shown with mutton usually from 7 to 10 per cent. dearer than beef, with sheep growing less offal in proportion by 5 to 7 per cent. than beasts, and producing from 12 to 20 per cent. in wool, in addition to meat—I have shown under such circumstances that if the sheep manufactures as much meat from a given amount of food as the beast, that the sheep must necessarily be the more profitable animal of the two to grow, graze, and fatten. I have shown that young growing beasts necessarily assimilate a larger amount from a given quantity of food to convert into bone, flesh, and fat, than the old full-grown beast; and that early maturity is the correct principle whereby to manufacture the largest amount of meat without loss or waste from a fixed quantum of food. I have further shown by my own experience that early maturity is the most paying course, and that young beasts, by proper economy in feeding, may be so fattened as to pay the marketable value for all the food consumed, whereby the manure is obtained free of cost. I have shown by general experience that buying lean beasts at a high price, and feeding them at an expensive rate, is not a cheap, but rather a very dear system of manure making. I have shown that such a system is unpaying as a meat manufactory, or a manure manufactory; that it is only warranted by the ulterior results when wheat is 30 per cent. above the average price, but that it is ruinous when wheat is 30 per cent. below par. I have shown that by the force of circumstances, from a restricted supply of lean cattle—from sheep husbandry, and beast fattening in the old rearing districts, having superseded calf and beast rearing; further, from an increased demand, from increased root culture—I say I have shown from the force of circumstances that the system of one man rearing beasts, and another man fattening them, has gradually become untenable, and that heavy losses by disease would appear to be hastening on a change to a more reasonable and secure course of procedure. I have shown the vast benefit which an intimate friend of mine—a farmer of stiff retentive soil—has derived from a change from bullock fattening to colt fattening, realizing in the one case a cipher for the root crop, but in the other securing 8d. for every bushel of mangold wurtzel consumed. I have shown that from the high price of dairy produce cows make a good return, and are profitable; at the same time, I have suggested the possibility of an improvement upon my experience, by substituting well-bred cows, which are capable of breeding good calves, in lieu of such as are simply useful for the pail. I have shown that pigs are profitable to such an extent as a sufficiency to consume the waste of the farm, but that beyond that number my experience does not sanction. I have instanced Mr. Shorten's veterinarian experience, and Mr. Harwood's and my own practical knowledge, to prove that cart horses require comfort and warmth, with good ventilation, as much as any other animal. I have compared the yard, box, and stall-feeding systems, and have shown, that as our fattening ends are unnatural, our means must be unnatural also. I have expressed my desire that upon the stiff retentive soils of the eastern counties we should have more lamb rearing and sheep grazing, more dairy produce, with calf rearing, and young beast fattening, securing early development and early maturity; also more colt fattening—all of which would pay

—rather than so much old bullock grazing, which does not pay. I have even advocated an alteration, if necessary, from the four-course shift to the five-course, that we may grow less wheat, which we don't seem to want, and more mutton, which we do want. In conclusion, and throughout, I have endeavoured to show, we must have young unstunted animals, of such symmetry and docility as to ensure early maturity, and a maximum of meat from a minimum of food—a maximum of first-class quality of meat, with a minimum of coarse meat and a minimum of offal. I would add, that there is no branch of our business which is more difficult of attainment than judicious stock farming; there is no branch of our business in which there is more ample scope for improvement, and a more full development of latent resources; and the general cause of advancement will be best promoted by individual judgment and individual effort, and by every man doing his utmost to secure the largest amount of pecuniary profit of which his occupation and position are capable. I know, Mr. Chairman and gentlemen, it may be considered I have too strongly condemned the practice of buying lean old beasts and fattening them, as carried out in the eastern counties. I know I have expressed myself freely, but I came before you with the intention to propound my honest convictions. I came before you with the determination to pander to no popular principle or general system. I came before you with the resolve to expose what I believed to be wrong and unpaying, and to uphold what I believed to be right and attended with profit. I have fully and openly explained my opinions, founded upon my experience, and if I have erred, it has been in my judgment, and not by design. I have the satisfactory assurance that an awakened public opinion will so canvass the deductions as to pronounce a verdict of error upon that which is error, and of truth upon that which is true in principle. I only desire to elicit sound conclusions, and to see established sound practices, based upon the cost of production, and the law of supply and demand. Profit best regulates systems of production, and whilst men discard the unpaying produce, and resort to the profitable, prices are regulated, and the public interest advanced. If, then, manufacturing lamb, mutton, young beef, milk, and horse-flesh, pays better than grazing old beasts, let some of us at least discard the latter, and adopt the former, to our own individual profit, and the increase of that national wealth which is the more rapidly augmented by the largest number of the most successful investments. I could have wished that my observations should more especially have referred to those splendid specimens of early maturity and perfect symmetry which we shall have the pleasure of examining at the Smithfield Club Cattle Show during the present week. We cannot control the force of circumstances; but few such animals are fattened upon the stiff retentive soils of England by hard-working practical men, consequently they were beyond my province of observation. But allow me to add, we prize them as incentives to exertion, and as models for our standards of attainment in animal development. I beg to thank you for your kind attention to my lengthened observations. I can assure you it will afford me pleasure to answer questions to illuminate any remarks wherein I have unintentionally been opaque or inexplicit, and I much desire to hear the expression of your experience in stock farming upon stiff retentive soils. (The reading of the paper was followed by loud and general cheering.)

Mr. W. BENNETT (of Cambridge) wished for a word of explanation with regard to the two bushels of mangold wurtzel per day, which Mr. Bond said he gave to each of his horses, as the quantity appeared very large.

Mr. BOND said they did not give mangold wurtzel separately, but they mixed it with corn and chaff, and the horses ate two bushels of cut mangold per day weighing $2\frac{1}{2}$ imperial stones per bushel.

Mr. BENNETT inquired how much water the horses drank? Mr. BOND said they did not take a large quantity, but they always had opportunities of drinking.

Lord BERNERS (Keythorpe, Leicester) wished to express the great pleasure he felt in being present at the reading of the most interesting paper which they had just heard (cheers). For the last two years he had been prevented from attending the meetings; but he could assure them that he had read with very great interest the discussions which had taken place in that club, and he regretted extremely that it had not been in

his power to attend them. With regard to the paper which had been read that evening, they would all agree with him that it emanated from a man of great practice and great observation (Hear, hear). There was very much in it to make people think, and he was sure that its dissemination would benefit agriculturists. One thing had especially struck him in listening to it, namely, that as in draining so in stock feeding, there could not be laid down any general rule for the whole country, but that they must all be guided by the peculiar circumstances of their districts (Hear, hear). As regarded the profitableness of sheep feeding in cases in which beast feeding had been carried on before, he could himself speak from experience. He had tried it on land of a very different nature from that which had been described; but he there found the results very beneficial, and he had also realized similar results on the strongest clay soil (Hear, hear). Mr. Bond truly observed that they must look to the races of sheep and cattle, and must take care to select the best—that is, those which had the strongest constitutions, and were most suitable for early maturity. Mr. Bond had spoken of the Hampshire downs. He (Lord Berners) had tried them to a great extent, but upon the land on which he tried them they cost him £600, and he was glad to get back to the Sussex. He tried the Sussex downs afterwards in Leicestershire. Being very much pleased by the success which he had with them in Norfolk, he persevered with them for twelve years in the county of Leicester, but he found the soil and climate unsuitable to them, and therefore he had to give them up for the Leicester and heavier breeds. Mr. Bond had dwelt very much on the comparative profit of old and young animals. Whether young animals would pay better than old ones must depend very much on the nature of the farm, its capabilities for breeding purposes, and so on. That gentleman had also observed that an old beast could not pay if it had 10 lbs. of cake a-day. Now, as he (Lord Berners) was speaking before practical men, he would give them the result of his own experience in this matter. He had found that to give the greatest variety of food was the best way to produce the greatest attainable amount of fat and flesh (Hear, hear). He had not himself late given any animal more than 4 lbs. of cake a-day. He found that one of his tenants was giving more than 14 lbs. a-day, and he asked him how he could suppose that that would pay when cake was £12 a ton? He entirely concurred in the remark, that it was best that rape-seed should go through the body of the animal, in order that it might increase the quantity of the wool and the value of the mutton. He had himself adopted that plan; it was more than thirty years since he first tried it, and he could testify to the value of Mr. Bond's suggestion. Again, that gentleman asked, why, when corn was at so low a price, they should not produce more mutton—why they should not adopt the five-course instead of the four-course shift? While that suggestion was being made, his friend on his left (Mr. Alderman Mechi) whispered "Won't that produce weeds and twitch?" On certain lands it no doubt would produce them; but how were they to avoid that evil at the time of year when they were most pinched for food? Sometimes their turnips were nearly finished, or their mangold wurtzel was almost exhausted, or was wanted for a better description of stock. Being pinched in lambing time they had recourse to rye. Here was seen the advantage of the fifth course, a second year of clover. In order to obviate the growing of weeds and twitch, he had been accustomed to get what was called a stolen crop of turnips. As soon as he had fed it down, in May or June, he scuffled it, fed it off, and it then came in for his wheat. As regarded the breeding of horses, considering the high prices which the Suffolk horses fetched, the great estimation in which they were held, not only in England, but also in Scotland, and in Ireland, where he saw some splendid specimens this year, he did not wonder, he said, that a gentleman from Suffolk should recommend that horses should be bred more than they had been; and he could say from his own experience, that if they selected good brood mares, and went to the expense of obtaining the best stallions that were available, instead of looking only to a low price, they would find the breeding of horses a very profitable item in the farming account (Hear, hear).

Mr. Alderman MECHE (Tiptree) must congratulate the Club on the very able introduction of his friend from Suffolk. He thought that the principal cause of that gentleman's success was his large consumption of straw. In former times he (Mr. Alderman Mechi) was laughed at by some of his practical

friends, for advocating the extensive use of straw; but they had recently had science to guide them on that point, and if they read carefully Mr. Horsfall's valuable papers in the Royal Agricultural Society's *Journal* they would there find that every 100lbs. of straw contained 30lbs. of gum, sugar, and starch, which was equivalent to 15lbs. of oil (laughter). Therefore they need not wonder that straw properly prepared was the right article to put fat on animals (renewed laughter). He was not surprised to hear gentlemen laughing at that, as it was so much opposed to their preconceived notions; but he hoped they would be governed by facts and by science. There was no doubt about the matter; there was in fact 15lbs. of oil in every 100lbs. of straw. And when 100lbs. of straw was of so much value, it formed, as a matter of course, the cheapest possible food that they could have to fatten their animals. This was not a mere theoretical question with him. Mr. Bond had spoken of the profitableness of raising young stock on a farm. Now he had reared, in the same manner in which that gentleman proceeded, forty calves, and, instead of paying £2 a piece for them, he paid only 30s. They came out of Buckinghamshire. He raised them on boards; they had nothing scarcely but steamed cut straw in very large quantities, with a certain proportion of rapeseed and a few roots, and in two years and a half they were sold as fat bullocks. Those forty animals were succeeded by fifty others, with regard to which the same round of treatment was pursued, and in two years and a half they also went out fat bullocks. He repeated, therefore, that with him this was not a mere question of theory. At one period, owing to some alterations in his buildings, he ceased to use such a large quantity of straw, and the moment that occurred he found that he was keeping his stock with less advantage. For a time he used large quantities of cake, but that proved comparatively unprofitable. He had since returned to his former system, being convinced by the science of Mr. Horsfall, which he found in the admirable papers to which he had referred, that by giving straw in a prepared state you were sure to make an animal thrive. He had a number of bullocks now feeding on that system. They had as much wheat-straw cut up and steamed as they liked: together with that they had three and a-half pounds of rapeseed, and three quarters of a pound of malt; and they had, further, probably, about thirty pounds of roots per day. He concluded, therefore, that straw was too valuable to be trodden under foot; and Mr. Horsfall had shown by large practice, as well as by science, that while straw was worth only 9s. 4d. a ton to plough into the ground as manure, they could give 35s. a ton for feeding purposes, and make a good profit. These were things which should not be laughed at, but tested (Hear, hear). He agreed with Mr. Bond, that young animals converted food better, and yielded a better profit than old ones. With regard to horses, he begged to say that he had given them mangel wurzel for some years; and he had found that when it was mixed with plenty of fine-cut straw, and the temperature of the roots was what it should be, his horses would eat readily from forty to fifty pounds per day. If the dung was in a proper condition, and there was no tendency to scour, mangel-wurzel might be given almost *ad libitum*; and he believed that in the spring of the year especially the general condition of the animal was very much improved by its use. He could not admit that Essex farmers were all men of straw only (laughter). The Hutleys, and the Carters, and others whom he might name, were anything but men of straw (Hear, hear). He agreed, however, with Mr. Bond that a great change was required in the character of the buildings. Moreover, the land must be drained. On this point, he was happy to find that many persons had lately adopted the opinions which he expressed fifteen years ago; and as they were now working in the right direction, and had begun draining at great depths on their stiff retentive soils, he hoped they would make the *amende honorable* to him when the proper time arrived (laughter). He believed that good covered buildings were essential on stiff clays; and he hoped that landlords would be found ready to erect them, and tenants to pay a reasonable addition to the rental—supposing that not to be too high at present—on account of their erection. He felt quite sure that it was not desirable, as regarded profit, to give a large quantity of rich food to animals. He knew that Mr. Hudson, of Castle-acre, had given as much as forty pounds per day, looking for a return in his wheat; but it was questionable whether

it would not be better to diffuse the manure by means of a larger number of animals.*

Mr. J. C. NESBITT (Kennington) said no one present—whether he was practically engaged in agriculture, or engaged in studying the practice of agriculture—could have listened to Mr. Bond's introduction without being convinced that he had well studied the various points which he brought before them (Hear, hear). He would just refer to one or two of those points on which he most entirely concurred with that gentleman. In the first place, he spoke of the impossibility of getting profit out of the food without having regard to the amount of manure. Now it would, perhaps, be in the recollection of some gentlemen present that some years ago, while speaking in that very room on this subject, he advocated the use of food in such a manner that the stock themselves should pay for what they consumed, and the manure be, as it were, given to the farm. He then said in effect what Lord Berners had said that evening, namely, that from twelve to fourteen pounds of oilcake per day for a beast was too much; and Mr. Mechi would perhaps recollect his saying also that if he would undertake to feed a certain number of animals, some on three pounds of oilcake a day, some on six pounds, some on nine pounds, and some on twelve pounds, and keep some of the dung which passed through the animals so fed, he would undertake to tell him how much of the oilcake had passed through the animals undigested. It was eight or ten years ago since he made that offer; and as the point had not yet been decided, he begged now to renew it, without limiting it to Mr. Mechi. The assimilating powers of animals depended very much on the time which they had for digesting their food. It was useless to give an animal a larger amount of food than it could digest within the time allowed. The great point was to give animals that quantity of food which was best suited to their condition and to the climate and the state of the atmosphere; it was only by observing these conditions that they could properly regulate the amount of food. With respect to straw, the chief use of it was to assist in the digestion of other food. If they gave animals oilcake or mangel-wurzel, or any other watery kind of food, without sufficient admixture of woody fibre, it would be impossible for them to digest it. Hence arose the value of chaff, straw, and any other kind of woody fibre. As regarded Mr. Mechi's account of the enormous value of straw, he had not read the paper to which that gentleman referred [Mr. Mechi: "I wish you would"]; but he apprehended that if he did so he should learn from it that Mr. Mechi had somewhat mistaken the author's meaning. Oilcake was sold at from £10 to £12 per ton; he had found, in hundreds of analyses, that from 10 to 12 per cent. was the maximum of oil which it contained; and, that being the case, he thought that straw, which could be bought even in London at about 25s. a load, could hardly contain 15 per cent. of oil (Hear, hear). [Mr. Mechi: "Do you know how much it does contain?"] He apprehended that 2 per cent., or even 1 per cent., was the utmost amount that could be predicated of it (Hear, hear). The chief use of straw was, as he had intimated, that it enabled them to use a large quantity of more nutritious food with advantage. He did not deny that there was a certain amount of nutriment in straw, but as to its containing the proportion of oil which Mr. Mechi assumed, if Mr. Horsfall or any other gentleman asserted that, he would pledge his reputation that it did not.

Mr. MEECHI said this was too important a question to remain in doubt. What he had stated was, that 100lbs. of straw contained 30lbs. of gum, starch, and sugar; and that that was equivalent to 15lbs. of oil. It was a chemical question whether that was the case or not (Hear, hear).

Mr. NESBITT said, then he would assert that 100lbs. of straw did not contain 30lbs. of gum, starch, and sugar. No one entertained a more sincere respect for Mr. Mechi than he did, feeling as he did that, by his experiments and

* Mr. Mechi since finds in Mr. Horsfall's paper the following— "In wheat straw, for which I pay 35s. per ton, I obtain $\frac{1}{4}$ lb. of oil, besides 32lbs. of starch, or (the starch produced as oil) 18 $\frac{1}{2}$ lbs. for 1s. 2 $\frac{1}{2}$ d. available for the production of fat, or for respiration. I know no other material from which I can derive, by purchase, an equal amount of this element of food at so low a price."

his great activity, he had done an immense amount of good throughout the kingdom (cheers). On this point, however, he certainly must be allowed to differ from him. Having analyzed straw over and over again, he had found it to consist chiefly of woody fibre, with some soluble organic matters, mingled with a large amount of ash; and any one who said that straw contained 15 per cent. of oil, said what would not bear examination.

Mr. Alderman MECHI: As you have analyzed straw, perhaps you can tell us what proportion of oil it contains?

Mr. NESBITT continued: If Mr. Mechi would send him a specimen of his straw to-morrow, he would analyze it (laughter). He said distinctly that the straw which he had analyzed did not contain any such amount of gum, starch, and sugar as had been stated (Hear, hear). Now, with respect to the various modes of culture which had been alluded to that evening, it should be recollected that lands and seasons and prices must vary the culture (Hear, hear). In all his addresses to farmers, he had laid it down that there ought to be no attempt to regulate farming throughout the country by fixed and invariable rules (Hear, hear). It had been clearly shown by Mr. Bond that evening that the farmer ought to be able to vary his cultivation with the variations in circumstances, and should not be bound always to adhere to the four-course shift; and he thought that, for that purpose, increased powers should, if possible, be obtained under leases.

Mr. F. J. WILSON (Essex) thought that the straw referred to in Mr. Horsfall's paper was not wheat straw, but bean straw, and any chemist would tell them that the properties contained in those two kinds of straw were totally different. (Hear, hear.) In Scotland, he might observe, it was very common for farmers to fatten their bullocks with oat straw. In considering how far wheat straw might be used with advantage, they should regard it as a vehicle by which the stomachs of the animals were enabled to perform their functions. Its chief use was to keep the stomachs in proper tension. An animal would be starved if it ate only mangold, containing, as it did, 87 per cent. of water; and the animal that ate most straw in proportion to roots was generally the one that did the roots most justice. This did not prove, however, that straw was a fattening article; it only proved that straw took away from the roots a deleterious quality which belonged to them when consumed alone. (Hear, hear.) The question which farmers had to determine for themselves was, how they could accomplish the production of a stone of meat, whether beef, mutton, or pork, not only without loss, but with a fair profit. He considered that it was well known that animals generally ate a fourth or a fifth of their own weight per week, while a bullock was considered to be going on very well if it assimilated a stone a week. Considering then the enormous quantity of food that passed away excrementitiously, the excessive use of oilcake must be a great loss; and surely if they wanted manure for their land, it was better to apply substances to the land directly, than to give £12 a ton for them, and let them pass through the animal. He should like to see a well-penned essay on the simple question, how far meat could be produced profitably by a judicious admixture of valuable and cheap food. The question before them being, how stock could be fed profitably on heavy lands, he should be glad to know whether the straw of which Mr. Horsfall spoke was wheat straw or bean straw?

Mr. MECHI said, Mr. Horsfall said it answered his purpose to pay 35s. a ton for wheat straw, and 40s. for bean straw.

Mr. WILLIAMS (Baydon, Hungerford) said he happened to cultivate some of the stiff retentive soils of Wiltshire. He had had very little experience in the feeding of bullocks, having found sheep-farming more profitable on the hills of his own county, as he could cut a fleece of wool off the animal in addition to what could be made of the carcase. Although the feeding of young animals might be the most advantageous, it was clear that some one must feed the elder ones, even though it was done at a loss; and with regard to them it was perhaps desirable that as soon as they had got a certain amount of flesh they should be sold, in order that the bone might produce as much as possible. (Laughter.) That, if it did not secure a profit, would at least prevent any serious loss. There was one point to which he could not help just adverting. If a man occupied a thousand acres of land, he would require 40 horses; the horses would consume a vast amount of produce, one-fifth of the whole produce of the farm; and as stock farming on stiff retentive soils required more horse-power than

stock farming on light soils, he thought it was desirable that the occupier should have recourse to the steam engine, which would displace one-half of the horses. If he were asked what in that case was to be done with the produce which the horses had consumed, he would reply, let the occupier feed young bullocks in place of the horses which he had got rid of. He should be glad if Mr. Bond would state whether or not the cost which he set down for feeding his horses on mangold wurzel included attendance. In May, 1855, he had the pleasure of introducing the subject of the general applicability of steam power to agricultural purposes; and although he was then considered a mere theorist, steam had since been brought into extensive use. He then introduced the question of providing a portable shed. (Cries of "Question.") He contended that it would be much cheaper to haul the building to the roots than the roots to the building, and that question was well worthy of consideration in relation to the cost of cultivation; as in these days of competition it would be wisdom in us to adopt the mode that would be most practical and economical.

Mr. MECHI said, having obtained the "Journal" containing Mr. Horsfall's paper, he would read the cost of fat derived from 100 lbs. of the following substances:—The fat obtained from meadow hay cost 3s. 7d.; from wheat straw, 1s. 7d.; from Swedish turnips, 4s.; from oilcake, 8s. 4d.; from locusts, 8s. 4d.; from Indian meal, 8s. 4d.; so that in fact they got for 1s. 7d. from straw what would cost 8s. 4d. if it were obtained from some other articles. He recommended them all to study Mr. Horsfall's paper.

Mr. NESBITT said, the amount of oil stated in this book to be contained in wheat straw was only one-half per cent.; beyond that, they had nothing more than an hypothesis that there were other matters which would form a certain amount of oil.

Mr. WELLS (Booth Ferry House, Howden) said, there was one point introduced by Mr. Bond on which he wished a little more information; he referred to what was said about the keeping of draught horses in loose boxes. He was not a cultivator of strong clay soil, but as he had twenty-five pairs of draught horses, he felt great interest in the question which he had mentioned, and he would be glad if Mr. Bond would tell them whether what he had said was founded entirely on his own practice. For upwards of twenty years he had always kept his horses in stalls. He quite agreed with Mr. Bond that cleanliness and ventilation were most essential; and what he wished to know was, whether loose boxes were preferable to stalls?

Mr. SMYTHIES (Marlow, Leintwardine), coming as he did from a part of the country where the bushel was not much understood, should be glad if Mr. Bond would give some weight by which the quantity of mangold wurzel that he gave his animals might be estimated.

Mr. BOND said, one imperial bushel of mangolds, as given to the cattle, cut with Gardner's turnip cutter, weighs 2½ stones, or 85 lbs.

The CHAIRMAN, in terminating the discussion, congratulated the meeting on the great ability with which the subject was introduced, and the practical manner in which it had been discussed.

Mr. BOND then replied. Adverting to the remarks of Mr. Mechi on the character of the Essex farmers, he said, he referred to two different phases of heavy land farming: he alluded to those who farmed without roots and without cattle, and to others who pursued the opposite course. In reply to Mr. Williams, he said, the cost of the mangold wurzel, for the young beast, included the cost of attendance. With respect to Mr. Wells's inquiry, in reference to his draught horses, he observed, that he had kept ten horses in loose boxes for the last five years, and he had found that they required less straw than before. With his stock system he wanted manure; he did not want the straw to be trodden down.

On the motion of Mr. Alderman MECHI, seconded by Mr. Nesbitt, thanks were voted to Mr. Bond for his able paper, and the proceedings terminated with a similar compliment to the Chairman.

THE ANNUAL DINNER

Took place on Tuesday evening, Dec. 7, at Radley's Hotel and was attended by upwards of 80 members and visitors. The chair was taken by Mr. T. Owen, of Clapton; and

amongst those present were—Lord Berners, Mr. Shearer, Mr. Jonas Webb, Mr. R. Smith, Mr. James Wood, Mr. Hudson (Castleacre), Mr. H. Trethewy, Mr. W. Bennett, Mr. Ald. Mechi, the Rev. T. C. James, Mr. G. P. Tuxford, Mr. H. Cheffins, Mr. J. C. Nesbit, Mr. Skelton, Mr. C. W. Johnson, Mr. C. Howard, Mr. John Williams, Mr. Marshall, Mr. Coussmaker, Mr. Congreve, Mr. C. Stokes, Mr. E. Purser, Mr. Cressingham, Mr. Sidney, Mr. R. Stedman, Mr. J. G. King, Mr. J. F. Baines, Mr. W. Eve, Mr. Coleman, Mr. Caporn, Mr. Corbet, &c., &c. Mr. John Thomas, of Bletsoc, the chairman-elect, acted as Vice-chairman.

After the usual loyal and patriotic toasts,

The CHAIRMAN said, he had now to propose a toast which he was quite sure would be drunk by all present with great cordiality, for it related to that in which they all felt the deepest interest, namely, "The Prosperity of the Central Farmers' Club." (Cheers). It was a great pleasure to him to see so large a company. It was also a source of deep satisfaction to him to be able to announce the continued progress of the Club during the present year—an increase which had only to be followed up by a like exertion on their parts to issue in the doubling and trebling of their numbers. (Hear, hear.) Looking back to the period of the formation of that Club, which was now 15 or 16 years ago, and comparing it with the state of things at present, he rejoiced to see the great improvement which had taken place. And where did those improvements for the most part originate? In societies and clubs, where men had opportunities of gaining new ideas, and where projects were formed which were afterwards carried out. It was by such means that they had attained the degree of progress which had already been realized. Every one must look back with delight to the gradual advance which had been made since the old-fashioned plough was the only one in use. He was himself living on a farm where his grandfather lived (cheers), and recollecting the kind of plough which was used in his grandfather's time, and seeing the improved manner in which they were now able to till the land, he felt that they had great cause to congratulate each other that there had been men amongst agriculturists who had had the talent to suggest improvements, and the energy to carry them out. (Hear, hear.) It was by the diffusion of intelligence, and the interchange of ideas, that agricultural improvements were most likely to be carried to perfection; and he trusted therefore that they would all put their shoulders to the wheel, and exert themselves to the utmost in order that a club which had proved so useful might attain increased prosperity. He proposed that they should now drink "Prosperity to the Club;" and he begged to connect with the toast the name of his friend Mr. Trethewy, one of their most active members.

The toast having been drunk with the honours,

Mr. H. TRETHEWY much regretted that that duty had not devolved upon one who was more competent to do it justice. As a member of the Club, however, he felt bound to obey the call of the Chairman; and, moreover, the interest which he felt in the Club would prevent him from shrinking from the performance of any duty which was fairly imposed upon him. That Club now numbered something like five hundred members, most, if not all, of whom were more or less connected with agriculture; and it could also boast of the countenance of many large and influential landowners, who by their support manifested that they were not ashamed to identify themselves with them (cheers). It would be a bold assertion to say that their list of members comprised all the best farmers in England; but they would be fully justified in saying that it comprised very many first-class farmers. (Hear, hear.) Constituted, then, as this Club was, he was sure it could not fail to prove a

very useful institution. They were not leagued together for the purpose of promoting their own interests, to the prejudice of those of other classes. On the contrary, they had a national object in view: their object was the improvement of the land—the advancement of agriculture. If they succeeded in that object, the effect must be increased production, and increased production must be a national benefit. (Hear, hear.) That the discussions of that Club had excited attention in other quarters there could be no question. It would be easy to adduce several instances, but he would refer only to one which had recently come under his own notice, and which he had no doubt had also come under that of many present. Within the last week a paragraph had appeared in the *Times*, to the effect that some Liverpool merchants had lately met together for the purpose of considering the question of securing a uniformity of weights and measures; and on that subject the "leading journal" had a very excellent article. Now that question was first brought prominently before the country through the medium of that Club, being introduced there by their late excellent chairman, Mr. Owen Wallis, whom he was sorry not to see now present. He did not say that Mr. Wallis was the person who first ventilated the subject, for it was discussed in several market towns previous to its introduction in the Club by that gentleman; but to him, he believed, was due the credit of having first brought it prominently before the public. That was one proof of the beneficial influence which the Club exercised. No longer ago than the previous evening they had a paper read to them on stock-farming on stiff retentive soils, to which no one could have listened without deriving instruction from. (Cheers). It might be said that gentlemen of superior information could publish books, or send letters to newspapers, and that information might be diffused as well by such means as by means of lectures and discussions. Now he (Mr. Trethewy) could not subscribe to that opinion. He thought that by far the best way of attaining the object was to have different subjects discussed in a friendly manner, because in that way the various views and opinions of the whole country might be brought to bear on the question at issue—an advantage which nothing in the shape of publications, or of correspondence, would secure. (Hear, hear.) He quite concurred in the opinion of their excellent chairman, that their success depended very much on themselves. (Hear, hear.) It was now something like sixteen years since the Club was established; "through good report, and through evil report" it had flourished and prospered, and he had no doubt it would continue to do so. (Cheers).

Lord BERNERS, with the greatest possible pleasure, rose to propose a toast, which had been entrusted to him by the committee of the Club—a toast which he was sure would be received with equal pleasure by all present, namely, "The Health of their excellent Chairman." (Cheers.) They had heard from that gentleman, and they had also heard from Mr. Trethewy, that the prosperity of the Club was increasing, and he had little doubt that much of the prosperity of the present year was due to the efficient and admirable manner in which the Chairman had conducted the business. Every one with whom he had conversed respecting the management of the Club had told him that the Chairman was an excellent man of business, and he was sure that the manner in which he had thus far presided that evening was such as called for the approbation of all present. One word modestly dropped from him which touched him (Lord Berners) very much; he always rejoiced to hear a farmer say that he occupied the land which his grandfather occupied. (Cheers.) One of the advantages of Clubs of that description—

and there can be no doubt that the advantages derived from them was very great—was, that they afforded to landlords and tenants opportunities of mingling together, and by means of the meetings which took place that bond of union which ought always to exist was drawn tighter and tighter. (Hear, hear). For his own part, he could declare with sincerity that he rejoiced in every opportunity of meeting the tenantry of the country. Mr. Trethewey had alluded to the interesting character of the topics which had been discussed in that Club, and had observed that the benefits derived from the discussions were not confined to the room in which they occurred. He referred, by way of illustration, to the very interesting paper which was read on the previous evening, but he omitted to refer to another paper of equal interest on the allotment system. (Cheers). In meetings like those of the Club every man expressed his views openly and independently; and if occasionally some things were said that were not quite correct, they were only met with a little playful rebuke—a sort of rebuke which was beneficial sometimes to all of them. (Hear, hear.) He had never attended a meeting of the Club without experiencing gratification; and if, as he grew in years, he found himself less able to enter into many subjects connected with agriculture, the longer he lived the more deeply was he impressed with the importance of agriculture, and of meetings for its advancement. Since it was first established, the Club had passed through various vicissitudes; but the indomitable perseverance and the skill which had been exhibited in its management had overcome all obstacles, and he hoped and believed that it would continue to prosper. He begged now to propose “the Health of their excellent Chairman, Mr. Owen.” (Cheers.)

The CHAIRMAN, in returning thanks, said he could scarcely find words adequate to express his sense of the honour which had been conferred upon him, but they might rest assured that he felt deeply sensible of it. He was proud of being surrounded as he was on that occasion by men of capital, intelligence, and integrity; and whom he regarded as representing the mainstay of the country. The Club might have had a much more efficient chairman than himself; it could not have had one who more sincerely desired to serve it (cheers). One reason why he especially prized that club was, that it had enabled him to form many valuable friendships—friendships from which he had derived great advantage in connection with agricultural science and practice. As regarded his own personal position as a farmer, which had been referred to by the noble Lord who proposed his health, he could not help remarking that, though he had no lease, he had an assurance from his landlord that his name should never be disconnected from the estate (cheers).

Mr. G. P. TUXFORD had been entrusted with a toast which he could wish had been assigned to some one more competent to discharge the duty of proposing it. He had to give, “The Royal Agricultural Society,” coupled with the name of Mr. Robert Smith (cheers). Most of them were old enough to remember the birth of that society, and hence, without taking a very distant retrospect, they could easily recal to their minds the state of agriculture previous to its existence. Many of them, too, could well recollect some of those who took a leading part in the early proceedings of that institution. The names of Spencer, and of Handley, and of several other founders of the society, would quickly rise up, as it were, from the past. But if in the early days of the Royal Agricultural Society its usefulness was generally admitted, and men went from one part of the country to another to see the little improvement which had been made, how much more universal was the testimony, how much greater the advance wit-

nessed at the present! If those who were at Oxford contrasted what they saw there with what was recently exhibited at Chester, nothing more would be required to show that this Society deserved the most cordial support from such a body of men as he was addressing—the members of the Central Farmers' Club—whom he had ever considered as constituting the van of agricultural progress (cheers). When he looked at the advance of the national Agricultural Society, and saw how by every means that human ingenuity could devise, the best energies of the mind had been devoted to the promotion of the welfare of the farming interest of this country, he felt that those who had commenced and carried on that good work had done honour alike to their own names and to the country to which they belonged (cheers). It was not, however, in our own Isle alone that the benefits arising from the Royal Agricultural Society were diffused; the civilized world was daily and hourly deriving advantage from that institution (Hear, hear). He knew, from his own sources of information, that the improved agricultural machinery which had been invented and manufactured in this country—machines which had been brought into use mainly through the medium of that society—were not confined even to the continent of Europe. If they looked from the confines of Russia, to our remote colonies in Australia, they would find English engineering talent was brought to bear on agriculture to an extent which was never known in any previous age of the world (cheers). Then if they already saw so much advance, what might not be hoped for, in the future! (Hear, hear.) If within a period of five-and-twenty years they beheld a society, numbering some thousands of men, uniting their efforts to make it more useful, in order that the growing population might be better fed, what might not be hoped for, if the society received adequate support, and full scope were given to it in its career of improvement! They might, indeed, well be proud of the position which that institution had really attained; but they must not be contented with the progress already made. They might depend upon it, that if they ever came to the conclusion that they had arrived at perfection, they would immediately begin to retrograde. They might rest assured that if they ever thought that it was enough to grow corn for the existing population without having regard to the future increase, they would find themselves dependent, in the hour of difficulty, on those who would assuredly disappoint them in their greatest need. Such were his views with regard to the Royal Agricultural Society—an institution which, in his opinion, deserved well, not only of the farming interest, but of every interest wherever civilization was known; and he felt confident that, having been carried on with so much success up to the present time, it would in future realize results far exceeding any yet attained. So satisfied was he of the importance of that institution, that he would fain hope that there was not a gentleman belonging to the Club who would not endeavour by every means in his power to enrol new members among such of his neighbours as had not already joined it (Hear, hear). Though the associates of that society were numbered by thousands, he felt sure that its usefulness would be much increased by the enrolment of thousands more; and when he remembered that the agriculturists of this country comprised one-third of the population, he was ready to exclaim with astonishment that there should be so few persons comparatively to represent that great interest. Moreover, when he considered the lectures now given to the members of that society by analytical chemists and veterinary surgeons, as well as the increasing ability displayed by the judges in the discharge of their duties, he felt that they had indeed reason to be gratified

at the advance which had been made. At the same time, the high qualifications of the judges would render it incumbent on those who had the construction of the mechanism of agriculture to use their best endeavours, that what had hitherto been done in that respect should, if possible, be surpassed. There never was a time when competition was so great, or when improvement was so essential. At the show yard at Chester there were more than one hundred engines entered for competition. Why, it seemed but yesterday since they first saw at Bristol only one engine (Hear, hear). Could any stronger evidence be afforded of the progress which had been made in the mechanical department? Of the stock it was unnecessary to speak with such an illustration as they had before them in the show of the present week; and, without detaining them any further, he would propose, "The Royal Agricultural Society of England," coupled with the name of Mr. Robert Smith (Cheers).

Mr. R. SMITH felt it a great honour to represent the noble society which had been so ably brought under their notice. About twenty years had elapsed since that society was formed, the Chester Meeting being, he believed, the twentieth; and he was happy to say that he was one of the first seventy members, and had been an active member of the society ever since; and therefore he could bear out what Mr. Tuxford had said with regard to improvement. That gentleman had alluded to the Oxford Meeting. Why, at Chester they saw broad acres covered with implements and cattle; they saw English agriculture properly represented, not only in the view of their fellow-countrymen, but also before foreigners. (Hear, hear). He felt that he stood there as an officer of a national society, and as an Englishman he felt proud of the position which that society occupied. All the world looked to it as a beacon and a guide; all the world looked to it for instruction in the art and science of agriculture, in machinery, and in the various breeds of animals. In the Smithfield Show they saw how much had been done, in a great degree through the instrumentality of the Royal Agricultural Society, to improve their animals; and now they had not only the most splendid English breeds, but also every variety of crosses. It was not long since the Smithfield Show was held in Goswell-street, where it occupied a very small space; and on that very day, in consequence of the increasing interest which was felt in the exhibition, it had been determined that they should look out for a larger building. They were, as Mr. Tuxford had intimated, living in an age of progress, and a new era was dawning upon the world, and they might depend upon it that if they did not move onward others would soon take their places. The Royal Agricultural Society was a society which had moved in troubled waters; but, looking back to the Chester Meeting, and considering how much money was taken there, he felt that it was now in a promising position in relation to the future. As farmers, they must not forget that useful publication—the Society's "Journal" (Hear, hear). If the discussions at the Farmers' Club were interesting and valuable, it should be borne in mind that in the "Journal" were treated important, difficult, and intricate subjects of the utmost importance to all agriculturists, and he had no hesitation in saying that there was scarcely a paper in the "Journal" that would not repay a second reading. If the management of the Society had in some respects not been all that was desired, the Council were now grappling with their difficulties, and increased support on the part of farmers would be an encouragement to them to go forward in the right direction. (Cheers).

Mr. Alderman MECHI had to propose "The Smithfield Club"—a toast which he felt peculiar pleasure in

proposing, because he regarded its gradual increase as a type of agricultural progress. At a former period in the history of the Smithfield Club, to which he hoped they all belonged, many persons exhibited their animals with the belief that they were the best in the world, and when the judges did not even commend them, went away no doubt feeling rather ashamed of themselves and wishing to do better in future. He hoped that what had thus occurred with regard to animals would occur with regard to a great many farms. Certain it was that wherever criticism had been brought to bear most upon agriculture, there improvement was most manifest; and he hoped that this source of progress would prove more and more beneficial to agriculture. The public were greatly indebted to the gentlemen who established the Smithfield Club, and to those whose great talents had ensured its prosperity. In using the expression "great talents" his object was, he confessed, to connect the toast with the name of Mr. Jonas Webb (cheers), and he must say that although they had not yet arrived at anything like perfection in agriculture, they had, through the exertions of Mr. Jonas Webb, the Duke of Richmond, and others, come very near perfection as regarded Southdown sheep. (Cheers). As regarded agriculture generally, he could not help saying that he considered it as yet in its infancy, more especially in buildings and implements. However much he might be ridiculed he must always express his honest convictions; and he did hope that now that they had got their stock nearly into a right state—and that it was so no one could doubt who had seen the present show—they would exert themselves to get the buildings right, so that they might harmonize with those beautiful animals which were the admiration of the world. (Cheers). He thought that the Smithfield Club showed them, after all, only the sunny side of agriculture; but, not wishing to take them on that occasion into the shade, he would at once propose that they should drink "The Smithfield Club," coupled with the name of Mr. Jonas Webb, and long might that gentleman be spared to be as useful to the agriculture of the world as he had been. (Cheers).

Mr. JONAS WEBB, as a member of the Smithfield Club, and as one of the stewards of the past year, begged to thank them for the manner in which they had received the toast. He must in one respect follow the example of Mr. Tuxford. That gentleman said he hoped there was no person in that room who would not exert himself to secure additional members for the Royal Agricultural Society. He (Mr. Webb) would express a similar hope in reference to the Smithfield Club. The committee had just offered an additional inducement to join the club, having granted to every member permission to have a private view on the day on which the judges made their awards. Such an offer could not fail to be tempting, as a private view of the animals when they were undisturbed, and there was nothing to distract attention, was worth all the rest of the show. (Hear, hear). As had been previously remarked, the place of exhibition had now become too small, the club having grown as it were out of itself, and a better site might be found both for the public and the stock. There was an arrangement with the proprietor of the present Show-yard for a certain period, but before that time had expired efforts would be made to secure a more suitable place. In the pursuit of that object, however, it would be borne in mind that the exhibition must be made self-supporting. It had been determined, too, that there should be three additional judges, the work having been too hard for the number who acted previously. In conclusion, he would again express a hope that all present who were not members of the Smithfield Club would soon become such.

Mr. S. SIDNEY proposed "Prosperity to the local agricultural associations of England." England was, he believed, almost the only country in Europe where there was not a Minister of Agriculture, and where the Government did not expend money to promote agriculture. It was fortunate for them that they were not dependent on the Government—not bound to take their plans of improvement from a theoretical functionary. In every parish almost—certainly in every important county or district—there was a society, which was exerting itself in the cause of agricultural progress by such means as it could command, and it was, in fact, the operations of the local societies that suggested the formation of that leading one which had convened them that evening. The Central Farmers' Club and the local clubs represented the essential difference between the government of this country and the governments of continental countries. In this country men were left to do the work of improvement themselves, and hence every man felt bound to exert himself to the utmost to promote the general welfare. He believed that if there was one reason more remarkable than others why English agriculture had made such rapid progress, it was that there was not a man in England who did not feel more or less interest in the pursuit. In other countries they found here and there agriculturists of extraordinary talent, who were labouring to advance agriculture either in colleges or as model farmers, but they were entirely separate from the rest of their countrymen. In this country, on the contrary, there was hardly any class of society which did not take an interest in agriculture. It was not only those farmers who, like their excellent chairman, had, by themselves or their ancestors, occupied the same farm perhaps for a century, that felt interested in agricultural pursuits; even working men were attracted to them; and many a man who had made a fortune in a colony, came here to apply his acquired wealth in the engagements of agriculture. He would associate with his toast the name of Mr. Spenser, a gentleman who was connected with one of the most intelligent local agricultural societies in England.

Mr. SPENSER, of the Botley Farmers' Club, said his title to the honour was founded on the fact of his having for many years acted as the secretary of a local club, which had just published its fourteenth annual report. It must not be supposed that during the period which had elapsed since that club was first called into existence it had pursued an undeviating course of success. In their early history they had to encounter many difficulties; they had to run the gauntlet, with prejudice on the one side, and ridicule on the other; and no ridicule was so stinging as that which they had met with from their brother-farmers. Many persons, who had since become active and useful members of the society, at that time thought that when farmers met together for discussion, they were as much out of their element as a fish out of water, or a shorthorn bull in a china shop (laughter). It was afterwards found that agriculture was a pursuit which not only required capital and experience, but a vast amount of mental study and the collection of numerous facts, and, he might add, the assistance, directly or indirectly, of many of the sciences; and hence it was no longer a subject of ridicule that farmers should associate together and discuss agricultural topics. He recollected very well that at an early period in the history of the society they discussed the question whether a given amount of money could be most advantageously expended in the purchase of artificial manures or of oilcake to be given as food to cattle. It was then supposed that those two kinds of expenditure were directly opposed to each other. On the occasion to which he referred, the question was decided in favour of artificial manures; but that question could no longer be entertained, it being perceived that there was no antagonism between the two methods of procedure. If such a question was proposed at the present time he did not know how it could be answered better than by the relation of a little anecdote which he heard some time ago with regard to a member of the Society of Friends. That person, having been unfortunate in business, and lost all his property, and having preserved his honour and his credit, several members of his fraternity determined to assist him. With this view they convened a meeting, to which all who were invited were to bring as

much of their surplus capital as they could spare, in order to set up their friend Obadiah again in business. At the meeting the chairman, addressing the party principally concerned, said, "Obadiah, thy friends have got together the goodly sum thou seest on the table to assist thee; how much of this large sum do thy necessities require?" Obadiah was a man of short speech, and holding his hat with his left hand, with his right he swept the whole sum collected into it, saying, "Friends, I have need of all." The moral of this story was not difficult to understand. If farmers apostrophised the land, and said to it, "Dost thou want artificial manures, or oilcake, or any other substance?" the land would answer in a voice of inspiration, "Farmers, I need them all." Those who had had most experience in such matters were found to be most liberal in their expenditure under both heads, it having been found that while oilcake would not supply the place of artificial manures, neither would artificial manures supply the place of oilcake (Hear, hear). He was here reminded of that great society which brought such large numbers of agriculturists to the metropolis at this season of the year. That was one of the oldest, if not the very oldest of the agricultural societies of this kingdom. Many years ago—in 1831—it was said to have performed its mission, having shown the country and the world which were the best breeds of animals to be selected for fattening. Few, he believed, even now took that view of the Smithfield Club; but the question was sometimes mooted in the country whether, for the benefit of those who had neither the money nor the ability to perform the task themselves, it might not advantageously institute inquiries with the view of ascertaining what was the best and most nutritious food for animals—in what form that food should be presented—how much should be given, and what variety there should be—and what was the profit and loss attending a particular course of action? He could not but think that some of the surplus funds of the society would be well employed in the solution of problems which so deeply concerned agriculturists (cheers).

Mr. W. BENNETT proposed "The Vice-President and President-elect for the ensuing year—Mr. John Thomas, of Bletsoe, Bedfordshire." A more practical, a more enlightened, or a more intelligent farmer than that gentleman there was not, he said, in this or in any other country; and the committee had acted wisely in electing him to fill the chair (cheers).

Mr. THOMAS briefly returned thanks.

The next toast which was proposed by the Chairman was "The Committee of Management, coupled with the name of Mr. Cuthbert Johnson."

Mr. C. JOHNSON, in replying, congratulated the assembly on the growing prosperity of the club, and said it was in a more satisfactory position than it had ever been before. Unlike clubs in general, it had money in the funds, and its finances were in a flourishing state.

The Rev. T. JAMES proposed "The agricultural labourers." The labourers, he remarked, wanted not charity, but employment; and there ought to be no lack of employment while there was so much land not brought into cultivation, and so much more which was not cultivated adequately. Far more attention ought to be paid to the physical condition of labourers and the state of their dwellings. The homes of many of the peasantry were at present a disgrace to the laud (Hear, hear). There was no possibility of cleanliness; and the sexes were so mingled together that it was impossible to observe the common decencies of life. He hoped that effectual efforts would speedily be made to do away with that state of things, for it was useless to talk of the diffusion of education or religion while vice, with all its evil consequences, was all but inevitable; nor could they suppose that the superstructure of society was secure while the foundation was so defective.

The concluding toasts were "The Visitors," acknowledged by Mr. Mitchell; "The Secretary," proposed by Mr. Stokes, and answered for by Mr. Corbet; and "The Press," with which the name of Mr. Tuxford was coupled, and who duly replied to the compliment.

Mr. A. SMITH, of Tipwood, Red Hill, materially contributed to the pleasure of the evening by singing three or four of his well-selected songs in his best manner.

DIGGING POTATOES.

Potatoes are best grown in drills that are thirty inches apart, as the width of interval gives room for working the land in the hollows, to kill the weeds and pulverize the soil, and also for the tubers to spread and multiply in the ridglet that is raised by the plough over the dung. The proper ground for potatoes is a heavy damp loam, of a good depth, of which the bottom is generally firm and retentive; and the land being wrought, and the potatoes planted, during the damp weather of the spring months, by the end of April, the bottom of the ground becomes very much consolidated from not being dried by the Summer exposure. The intervals of the drills are ploughed during the early summer with the miniature plough drawn by one horse, which is much the best horse-hoe, after all that has been spoken and written on the subject of drill hoes and scarifiers. On stiff bottoms, of all kinds, it far exceeds any scuffler yet known: the narrow-pointed share pierces the ground, and raises fresh soil to afford evaporations; and if double time is spent in the hollow of each drill, the superior effect amply compensates the time that is spent. The light scuffler with knives makes very good work behind the ploughings, by which two furrows of loose soil are produced, to be wrought and pulverized by the lighter implement. The sole plate of all ploughs sledges the ground underneath its action, closing the pores and shutting the orifices of the soil, and denying access to air and moisture. The bottoms of potato grounds are much closed by this sledging action, from the damp condition of the Spring cultivation of the land; and by the Summer working of the intervals by the miniature plough; and lastly, by two furrows of the double mould-board plough, which moves along the bottom of the interval, in earthing-up the drills, and, with a long sole-plate, sledges and consolidates the ground beneath its action. In this manner, the entire under-surface of the ground is rendered firm—and that in the pores and orifices: the modes of working the land and cultivating the crop, all tend to produce this result.

The general maturity of potato crops happens in the month of October, when the drills are split by the double mould-board plough, or raised and thrown, or cast, over by the common implement—the stems being first pulled by hand, and carried from the field. The tubers are exposed to view, gathered by hand; the ground harrowed; and roots again gathered. This ploughing sledges the

bottom of the drill that escaped the Summer workings; and, when the land is sown with Autumn wheat, the furrow of that ploughing does not penetrate below the former workings; and the consolidated condition remains of the underground to rest in the future crops. The last sledging is above, rather than beneath, the former operations—covering the whole with a fresh repetition.

The digging of land, by spade or fork, surpasses in effect the ploughing of the ground, in a very chief advantage of the narrow angular points of the implements piercing the underground, and leaving holes and cavities, pores and orifices, which remain open, for the permeation of air and moisture. The moved soil is also laid more loosely together, and enjoys the benefits of that condition. Weeds are completely removed from the land; and stones are very conveniently gathered at the same time. Digging or forking of the ground is most advantageously performed after the ploughings of the land have been done, in order that the ground may remain in the open condition from the loose movement of the soil for the future crops. The Autumn is a very proper season in which to open, by digging the under-stratum of stiff lands, that are not clay soils with wet bottoms, and not proper of being mixed with the upper ground. A portion of the subsoil may be raised by digging; and the unmoved stratum must be pierced by the points of the implements to open the passage of air and moisture. The stems of potatoes must be pulled by hand in October, and carried from the field—the adhering soil and tubers shaken, or torn away, and the potatoes gathered and conveyed to the store pits. A man, provided with a three-pronged dung-fork of the farm, is appointed to dig one drill of the potato ground, and pushes the implement into the soil as deeply as can be done, raising a load of earth, which is thrown abroad, and scatters the tubers into view. A woman, or lad attends each digger—gathers the potatoes into baskets, which are emptied into carts that carry the loads to the store-yard. At the same time, any weeds that have escaped the Summer cultivation and cleaning of the land are gathered by hand from the loosened soil, and laid into heaps; and the field stones are also gathered and placed in small collections, as the work proceeds. A supervising care makes sure that the bottoms of the intervals of the drills are dug by the fork, which underwent the cultivation of the Summer working, and have been consolidated: each digger must

move deeply the interval on the right or left hand, as may be convenient; and the depth must be equal to the full length of the implement. The strong pronged dung fork of the farm is better fitted than the spade for digging potato crops: the wide prongs do not cut the tubers as the close blade of the spade; the pushing into the ground is easier for the digger; and the narrow points penetrate the ground more deeply, and leave a greater number of holes to receive air and moisture. No portion of the soil must be unmoved, more especially the bottoms of the intervals, which, if not dug and turned up, remain as firm rafters of ground betwixt the loose ridglets in which the tubers were produced. The drills are heaved and moved by the many tubers of the potato plant; and it is essential that the firm bottoms of the intervals be dug and mixed with the pulverized earth of the ridglets, and also with the undecomposed remains of the farmyard dung which will be found in the drills. These different bodies, being raised and placed in a new position of looseness and mixture, will present a fresh soil of varied elements to effect fresh combinations and reciprocal affinities.

By this mode of raising from the ground the ripened crops of potatoes, there are attained three very important purposes of execution—the crop is harvested; the land is thoroughly cleaned of weeds

and stones; and the substratum of the ground is pierced by narrow points of implements, which leave holes and pores for the permeation of air and moisture. The digging and forking of the ground confer the advantage of a loose condition, in which the soil is placed to lie over winter, or sown with Autumn wheat from one furrow of ploughing. This moved condition is very favourable to the heavy lands and stiff bottoms on which potatoes are generally cultivated, and which are unavoidably consolidated in the subsoil by the workings of the land for the cultivation of the crop. It is a gardening performance intermixed with farming, and varies the executions by a more beneficial process. The expense is very much reduced, by reason of the several objects that are attained; and, if not legitimately to be divided into three portions, the whole expense is very considerably lessened, from being wholly charged to the raising of the potato crop. Two-fifths may be very fairly subtracted from the whole expense as placed to the account of the benefits conferred on the land by the digging of the ground; and this moderate calculation will not overrate the advantages of the mode of harvesting the potato crop. It raises the crop, digs the ground, forks the soil, gathers stones and weeds, and opens the subsoil to the beneficial permeations of air and moisture.

J. D.

THE HISTORY OF A STRAW-YARD.

I have a very good landlord; and if a whirlwind were to sweep down all my farm-buildings past recovery by anything that could be included as "repairs," very likely he might be persuaded to realize, in actual brick, mortar, mason-work, and joinery, that enchanting ideal of a home for domestic animals—a covered farmstead. But, unfortunately, an old barn, a dilapidated stable, and a tumble-down granary were the only buildings my predecessor had when he first became tenant; and, by way of improvement, he obtained a long line of open shed, a waggon-hovel, and a brick wall, in place of the miserable haulm-fence which had previously inclosed a large court or yard for his uncomfortable stock. Well, of course, I could not have all these pulled down, and a bran-new farmery erected, after one of those beautifully-engraved "plans, elevations, and sections," now so familiar to the eye of the land-agent and agricultural pupil; and ameliorations of different kinds must content me. The landlord built me a better working-horse stable, chaff and harness-houses, a loose box, a "hospital," a cow-house, and half-a-dozen smaller houses for calves, pigs, and store-rooms. I had good gates, good water-troughs, and division-fences to the main court inclosed by all these convenient buildings; and, having enlarged my stack-yard to contain the in-

creased produce to be looked for, I fancied I had a tolerably comfortable steading to farm with. In course of time, portions of the long shed, which was open to the yard for the shelter of the cattle which there consumed my straw with turnips and oilcake, were detached, and inclosed with thorn-faggots, so as to make feeding-stalls and boxes; then proper brick walls took the place of the thorns, and new mangers, and water-troughs with supply-pipes, were set up. I fixed a two-horse chaff cutter; had my root-slicers and pulpers (the latter supplanting in use a small steaming apparatus) in places commodiously adjoining the stalls where the fattening animals were; and many of the appointments of a well-ordered establishment began to render mine a respectable homestead.

But one essential point had been altogether overlooked or slighted: there was no provision for taking care of the valuable manure produced either in the open straw-yard or in the covered hovels. Sun and wind dried out the moisture of the upper portions of the manure, as the pigs rooted up the straw with their omnivorous snouts, in search of anything nasty; so that, in some seasons, with little rain-fall in late spring, I had mere wetted chaff and straw to cart out to the dung-heap, instead of fermented rotten manure, aro-

matic with volatile nourishment for crops. The loss in wet weather was worse; for the courts, beside lying open to receive all the rains and snows descending upon an area of 1,200 square yards, were drenched by the additional fall from 600 square yards of roof. And only think of the immense quantity of rich, fertilizing salts, and soluble food for vegetation, that must have been dissolved and soaked and washed out from the three or four-foot thickness of manure deposited and trodden down by the stock! Where did the drainage flow? One yard was dished or hollowed toward the middle; and the bottom, being a sandy soil, impregnated with vegetable matter, &c., from the manure, and wetted and trampled with great and repeated pressure, had become so hard and impenetrable, that little waste could percolate downward; hence, a complete pool or spongy mass of litter occupied that yard in showery weather, necessitating continual supplies of fresh bedding for the poor cattle or young horses, which, you may be sure, kept finely healthy, lying night after night for weeks upon straw, through which their weight forced up the wet from the reservoir underneath! The other part of the court, being lowest on one side, had a vent through the wall there for the escape of surplus liquor from its saturated straw; and month after month you might have seen the dark-coloured pungently-odoriferous stream trickling down into the semi-putrid water of a pond, hideous with prismatic and nauseous colours mantling its surface, disgusting even to filthy ducks, a residue also forming a stagnant nettle-shrouded ditch in another direction. To get into my bullock hovel across the yard, you were over your shoe-tops in manure-water; the feeding-sheds and stables were dry and comfortable, but the solid manure was all thrown out from day to day, to undergo the exposure and air-and-rain-deterioration of the open yard; and the only drain-gutter-and-grating on the premises was that in my nag-stable, where the ammoniacal valuable liquid is allowed to dribble into a "dry well," and so hopelessly got rid of, without any attempt at saving or utilizing it. What a place to manufacture manure in for improving the farm, to collect every scrap and oddment of animal or vegetable matter not strictly marketable, to be conserved and prepared by decomposition and fermentation, and developed into all sorts of invaluable chemical salts and gases for forcing crops of roots, corn, and grasses! What a place to consign my weekly five pounds' worth of dear oilcake to (indispensable food, in spite of the mahogany sawdust that is so largely produced in certain great linseed seaports, and is believed to form a portion of the "vegetable matter" of well-husked and essence-flavoured cakes)! What a place to consume my far-greater allowance of corn, barley-meal, scalded wheat, ground peas, and beans in! What a place in which to have my splendid juicy roots devoured with wholesome barley-straw and pea-straw, and sweet expensive hay, and also pulped and partly fermented with bright wheat-straw chaff! What a place for milch cows to yield rich milk in; for hardy steers to contract catarrh and pleuropneumonia in; for young calves to get their coats set

wrong way; for pigs, that should conserve all crumbs and litterings, and be the healthy living save-alls of the farmery, to grow lank on their sodden layer, and produce ulcered pork! No wonder that I vowed to get wet-footed no more on my cattle-bedding, even though I could neither have a costly roofing, a systematic drainage by pipes and gratings, or an excavated tank, with pumps and paraphernalia, with water-carts and plots for irrigation. Eave-spouting promptly put up did not cost me a very heavy figure; but some neighbours said, "Our manure is often too dry, even when all the buildings drip into the yard;" to which I replied, that I could do what I pleased with the rain-water when once in my shoots, and when the straw was full dry, I could pour my downfall outside the water-tubs as well as into them, or might conduct it in V spouts over any part of the yard. But, in fact, I have not yet found any disadvantage from keeping roof-droppings off the necks and loins of miserable horses and bullocks. How do I lay dry the yards and sheds without wasting the rich drainings, without costly arrangement, and with little expense in labour?

Well, the only two of my houses which were at all conveniently situated for being drained to one point were soon cured. And I may say here, that the haphazard arrangement of my building—having been erected bit-by-bit in a hand-to-mouth fashion—was so inconvenient and inconsiderate, that the labour lost in carrying and reconveying chaff and pulped-roots, mixed meal, and cake, and milk, &c., from one angle to another, is something serious; and the relative situation of places for different kinds and ages of stock is somewhat confusing and bewildering to a visitor. I put a grating in the working-horse stable, and another in the cow-house, to draw-off the drainings into a short pipe-tile drain, emptying outside the wall of the straw-yard—not to run away, but to be caught by a device to be presently described. The hard bottom of the large yard or court was lowest in two places—one spot being near a side wall, and the other near a division fence of rails and tall thorn-faggots. In each place I dug a *semicircular hole*, of 4 yards diameter, the flat side being next the wall or fence. These holes are only about 2 feet deep, thus requiring no bricking, cementing, &c., and they are fenced off from the straw-yard by a "wattled" or braided fence of stakes and willows—still further protected by a few stout posts-and-rails. The object is simply to preserve these spots from being covered with straw and manure, and to keep out the cattle and pigs. The effect is, that as the drainage of the yard fills these holes or low places, I can get at the liquid with pump or bucket or scoop, just when I please, instead of having it saturating the yard and being incapable of removal unless the litter be taken away with it. Several times my yard-man had been caught in the act of picking a hole through the yard wall, to let out the water which floated and "swum" the lower parts; but he had been promptly forbidden to let go the fertile liquor; and at last these miniature tanks opened up a means of relief. By means of portable lengths of spouting laid upon the straw when necessary, I distribute the manure-water

back to the dry portions of the yard, taking it out of the tanks with a wooden scoop or "jet." When there is too much wetness already in the yard, I take it away altogether by means of a very simple species of *liquid-manure cart*. I bought a 98 gallon rum-puncheon of a liquor-merchant; had a couple of deal rims put on it, so that it could roll without the "bouge" touching the ground; and gudgeons, like those of a churn, fixed on the two ends; and chains attached, so that a horse can roll it along. This cask, so fitted up, is placed in a hole dug for the purpose, sufficiently low for the stable and cow-house drainage to pour into the bung-hole. When it is to be emptied, the bung is put in; a sort of barrel-churn fastening holds it safely in. A horse is yoked to the chains, and rolls the cask up two inclined spars on to the level ground; then it is taken to some garden-paddocks near at hand, to the pastures, the plot of Italian rye-grass, the compost heaps of gathered ditch-scourings, pond mud, road-scrappings, ashes of burnt hedge-clippings, &c., or wherever it may be wanted. For distributing upon the grass-land, the cask is taken half full, then filled up with water from a pond close by, so as to avoid too strong and burning a dose; and the bung being withdrawn, the liquor flows out inter-

mittently as the cask rolls round. Pulled into the straw-yard, alongside one of the tanks, it is soon filled with a scoop; and thus, with little expenditure of labour, and with a water-cart costing only about a couple of sovereigns altogether, my liquid manuring is accomplished, the excess of water removed from the yard every few days, many acres round the homestead kept in splendid condition, to say nothing of fat beds in the kitchen garden, bringing rhubarb like tree-trunks and asparagus thick as hoe-handles, some rare mangold and turnip compost manufactured by the rich filterings, while the general mass of farmyard dung is improved instead of deteriorated by the removal of these washings. The precise expenses in labour and the value of returns in augmented fertility, saving of manure-making material used in the yards in the shape of cattle food, and the increased comfort, healthiness, and thriving of the stock, it may be difficult to compare; but those managers who are situated as I was will doubtless appreciate the advantages as highly as I do. Certainly "a good schemer is better than a great eater;" and let young farmers, who are fond of trying new dodges when these are comparatively inexpensive, make an experiment of my cheap tanks and rolling water-cart.

QUISQUIS.

ACTUAL EXPERIENCE WITH THE STEAM PLOUGH.

If "an ounce of practice be worth a pound of theory," the following particulars of steam-ploughing upon two farms will doubtless be appreciated by our readers; and mainly because they describe the working of the ploughs by agricultural labourers upon the land of business men, instead of mere trials against time with a set of show tackle under the practised guidance of the inventor's workmen.

Between Stafford and Wolverhampton, and near to the estate of Lord Hatherton, where the steam-cultivator of Mr. Smith, of Woolston, has proved so successful in cleaning foul ground, forwarding the preparation of land for root crops, effecting deep tillage, and saving horse labour, we have lately seen one of Mr. Fowler's steam-ploughs at work; this is on the farm of Mr. Bird, of Littywood, near Penkridge Station. The soil varies from a hard red-brown conglomerate of clay and pebbles, stiffened in the ancient days by enormous applications of "kag marl" from the great pits which still gape in every field with openings more than 20 feet deep, to lighter soil where the gravel predominates. Bare fallows were customary, but are giving way to a more profitable growth of mangold, turnips, &c., partially caten off by sheep. The fashion is to plough in "five-bolt butts," that is, small lands or stretches of ten furrows each; and the work being thus all "cops" and "reanes," not only is there a waste of ground from such a redundancy of water-furrows, but there is a great loss of time in ploughing, by having to gather up the land. By means of good pipe drainage, 3 or 4 feet deep, Mr. Bird, who farms

600 acres, only a small proportion of which is pasture, has been able to practise ploughing on the flat, with the result of a considerable increase of yield in his crops, in spite of the forebodings and taunts of neighbouring managers, who prophesied a beautiful "irrigation" of his wheat, after a smart rainfall. Horse-ploughing, 6 inches deep, is done with four horses; and the "custom of the country" allows the outgoing tenant only 10s. for the operation; whereas the four horses at 2s. 6d. each, man 2s. 6d., and boy 8d. per day, make an expense of 13s. to 15s. per acre; and when the work is heavy, or at a depth of 7 or 8 inches, and only three roods a day can be done, the cost amounts to 17s. or 20s. per acre; and deep ploughing is especially demanded on this over-marled land, in order to bring up the lighter soil that lies beneath.

After much consideration and examination of different steam-tilling apparatus, Mr. Bird has adopted Mr. Fowler's plough in connexion with an engine of peculiar construction and capabilities, purposing also to work a scarifier with the same tackle, and he has lately turned over a considerable extent of land, some as much as 8 inches in depth, the principal part of the work averaging 6 to 7 inches. In fifteen days about 70 acres have been ploughed, and six removals made, averaging about half a day each, as some of the fields were a long way distant from each other. This will be equivalent to about 6 acres for a full day's work, that is, from 7 to 5 o'clock, with half-an-hour's stoppage for breakfast, and an hour for dinner. In a ten-hours' day of course a larger amount of work would be accomplished.

To have ploughed the 70 acres in fifteen days by horses would have required twenty to twenty-four horses, working five or six ploughs. But the force of teams kept upon the farm would have been perhaps ten days longer in doing the same extent of work; and the wheat-seeding has not only been forwarded thus much, but has been still further accelerated by the horses getting on with harrowing and drilling while the steam-plough is at work—simultaneously, instead of having to wait for their own slow ploughing. And the setting-in of a week's frost has still more strongly enforced the advantage of this expedition. The steam-ploughing has been well done, the slices are well-turned, and so shaken by the rapid motion of the implement, and loose from the absence of trampling, that less reduction of the surface by harrows is found necessary, and the ground is in a better condition for the seed to strike in. The fields are hilly, and by no means rectangular; yet the engine on one headland and anchorage on the other travel without obstacle or difficulty, the rope being let out or taken up to suit the fluctuating length of the furrow, which varies from 400 to 200 yards and less. In one field, the plough, turning three heavy furrows (though four furrows at a time on all but the strongest land), descended into and mounted out of a partially-filled marl pit 20 feet deep, the sides sloping with a "batter" of one in two, and in some places an angle of 45°.

What have been the items of expense for these fifteen days' work?

Labour: 3 men and 2 boys, coal, oil, and water-carting, about.....	£22	10	0
Extra for removals (only 2 horses being required, owing to the engine being locomotive)		0	18
		0	18
		23	8
Wear and tear, and interest, say 20 per cent. :			
On Engine.. £420	} charged on 200 days in the year.....		
On apparatus 420		12	11
£840		3	
		£35	19
			s. d.
The working expenses on the 70 acres are thus.....	6	8	per acre.
The wear and tear, interest, &c.....	3	7	
Total about....	10	3	per acre.

The cost by horse labour would have been one-third to one-half more, besides the work being so far behind hand and so much less efficiently performed.

We should add here, that several days' delay occurred at first, by the fracture of one of the spur-wheels on the windlass, the engine being too powerful for the machine, and with stoppage which arose from a new and untried attachment of the hooks to the ropes. This is now rectified.

One of the chief points of interest about Mr. Bird's operations is, that the steam-ploughing machinery is almost independent of horses, as it travels from field to field, or from one farm to another, with only a single horse to steer the engine; even this, however, is un-

necessary, as the engine may be steered by hand; but a horse being required to lead out the rope, &c., in the field, he is put into a pair of shafts on his way there. One horse is also employed to take the balance plough, while the windlass and the anchorage are both yoked behind the engine. To shift a portable engine with the whole machinery, would require ten horses, if going a considerable distance; four horses, if merely from one field to an adjacent one, in which case the team can make several journeys in a half-day. If we take five horses as the average number required, the cost of the six removals would have been, say, 43s. instead of 18s.; that is, the expenses of ploughing would have been more by 4d. per acre; and in the case of travelling a few miles, the cost would be 8d. or 1s. an acre more with a common portable than with a locomotive engine. Of course we must deduct something for the cheaper prime cost of the simple portable; but the saving of a small price per acre is of less importance than the advantage of being able to take the apparatus to its work without hindering the team from the sowing or other urgent operations they may be engaged about. The chief advantage of the locomotive engine, however, will be in connexion with a thrashing-machine.

We said the engine is disproportionately powerful for the windlass. In fact, it was not built for the purpose of being used with it; and while nominally of 12-horse power, in reality works at some 25 to 30 horse power, at 60 lbs. pressure, or more. It is designed and constructed by Mr. John Smith, of Coven, near Wolverhampton, specially for traversing common roads and arable land. The tubular boiler is mounted upon a wrought-iron framing, and balanced midway upon plumber-blocks, so that it can be easily and instantly adjusted by screw, and preserved in a horizontal position when traversing an incline. In going up a short hill this regulation is not found necessary, as the "swill" of the water appears to keep the tubes sufficiently cool; but when standing for some time on a sloping headland of a field, &c., maintaining the level of the boiler is of great moment and safety. The cylinders are not attached to the boiler, but are placed underneath it, within the iron framing, and the steam passes by a pipe from the top of a high steam dome, and through a stuffing-box at the point of suspension of the boiler. There is also another stuffing-box, through which the water enters the boiler from the feed-pipe; and the exhaust steam is conducted to the chimney by a short piece of flexible pipe. The hind-wheels and fore-wheels are about 9 feet apart, so that a depression in the ground makes but a slight alteration in the position of the boiler; and the balance-motion allows it to be adjusted so as to continue horizontal on an incline of 1 in 10. The propulsion is effected by an endless pitch-chain from a pinion on the crank-shaft (under the boiler, and supported in bearings on the framing) to a cog-wheel on the hind-wheel axle; each travelling wheel being set tight or loose on the axle by means of rings, which clasp like a brake. Another peculiarity is that the whole is supported upon strong springs; and the weight—about 7 tons—is so distributed that rather more than half rests upon the

hind-wheels. Over very imperfect roads, up gradients of greater steepness than 1 in 10, up-hill and down-hill in arable fields, this engine travels, without having recourse to the "endless rails," though in some circumstances they would be advisable, and it works for any length of time upon a comparatively steep headland without danger to its tubes or fire-box.

But we cannot dwell longer just now upon this ingenious invention, and must proceed to detail some still more extensive and satisfactory operations in Wiltshire.

Mr. Thos. H. Redman, of Overtown, near Swindon, farms on the hills in the vicinity of the chalk downs; but though you see fine turnips and swedes growing, and the spade finds chalk rubble and pebbles at five to fifteen inches below the surface, there are plenty of indications savouring strongly of a heavy soil; a considerable breath of bare fallows, the ground light-coloured, but hard and brittle in dry weather, or stony like concrete; and when wetted with a shower, greasy, slippery, or sticky, like birdlime, making heavy work alike for the antique wooden plough of the neighbourhood, or the steel mould-board of Howard's modern one. Naturally drained by the soft rock beneath, this forms a rich, unctuous soil, tiresome in wet weather, and "mauly" enough under the foot of the ploughman, but requiring only a greater depth and perfection of tillage, and freedom from the kneading tread of the team—solidifying a mass already too consolidated—to produce far greater yields than are at present raised, and become no longer a costly, but a grateful calcareous clay. On 430 acres arable seven ploughs are requisite, and the team kept to work them consist of 13 horses and 13 oxen; three horses or four oxen ploughing a furrow $4\frac{1}{2}$ or 5 inches deep. It is quite possible that the powerful high-priced horses used by Mr. Redman might be exchanged, with mechanical advantage, for more active and naturally quick-stepping horses; but still it will remain true that excessively heavy work has to be done; for we ourselves tested the draught of a Howard's iron plough with steel mould-board, finding it to be in two fields 6 cwt. for a furrow 10 inches wide and 6 inches deep, and in two other fields no less than 10 cwt. for a furrow 10 inches wide and 7 inches deep. The frost was out of the ground when these trials were made, but the labourers declared that the work went far easier than is frequently the case. The customary allowance to a tenant for one ploughing is 8s., 10s., or 12s. an acre; but it evidently costs much more, and, after all, the work is most imperfectly and miserably done. The winter-ploughing Mr. Redman estimates at 16s. per acre, reckoning horse-keep at 2s. a-head per day. However, as each horse has $1\frac{1}{2}$ bushels of oats per week, with wheat-chaff, and $1\frac{1}{2}$ cwt. of hay, we should take the daily cost of a horse at 2s. 6d., making the work considerably dearer. Ploughing by oxen, at the rate of 4 acres a-week for each team of four, he has carefully estimated as costing 5s. 6d. in summer and 8s. 6d. in the time of winter-keeping; but the work is shallow, the injury by trampling and poaching very great, and woefully inferior to that required by this land,

but which teams are utterly unable to perform at all. Three horses, costing 15s. each per week, and a man and a boy 10s. (in this county of low wages), amount to a sum of 55s.; and the 4 acres ploughed in this time cost therefore nearly 14s. per acre. Consider, moreover, that the depreciation in value of the horses on such land as this is a heavy matter, besides the interest of first cost, and the expense of harness, implement, &c., to be added. Some of the work done by the steam-plough was 7 inches deep, bringing up 2 inches of the hard subsoil, and the draught of a furrow being 10 cwt., showed that six horses would be required in order to achieve such an operation. Yes, light-land managers! a horse cannot drag 2 cwt. all day here as he could with you, because of the labour involved in the bad walking—an element that ought never to be lost sight of, in calculating horse-power. Six horses would do little more than half an acre a-day, say 4 acres per week; and the cost then amounts to upwards of 25s. per acre, or considerably more, including depreciation, interest, and contingencies.

No wonder, then, that Mr. Redman should make up his mind (as great numbers of farmers similarly placed will be found to do) to try steam-ploughing. Having purchased one of Mr. Fowler's sets of tackle with a ten-horse double-cylinder engine, he has turned over 150 acres in about thirty-five days of actual work, or an average of nearly $4\frac{1}{2}$ acres per day. Eleven acres of the heaviest work of all were completed in four days. The estimated expense, reckoning wear and tear, and interest at 20 per cent., and two hundred days' work in the year, at 5 acres a-day, and say one removal in a week—the fields being large—comes to about 9s. per acre average; the heaviest work to about 15s. per acre; from which it appears that the steam-plough has worked at about one-third to two-fifths less expense than the animal power. This cheapness of tillage, however, is a small consideration compared with the saving of time, the depth and excellence of the work, the keeping of fewer horses, &c., all which points we must reserve for a future communication, which shall contain minute details of the work on this farm.

HOW TO PLANT ROSES.—Low, wet ground is unfavourable for the growth of roses, and if planted in such soils, without the aid of artificial drainage, they soon become mossy and die away. Where your soil is of this character you must proceed thus:—First of all have the whole of the ground well drained, then trench it over to the depth of eighteen inches or two feet, throwing the mould up in ridges to allow of the frost and winds to act upon it; when thoroughly dry, level it down, and where the plants are to be placed, take out the soil two feet deep; put about six inches of brick-bats in the bottom, then mix some well-rotted manure with the soil, and fill in as before. With a deep stiff loam and dry subsoil, which is the natural soil of the rose, little more than trenching and manuring will be required, excepting for the tea-scented and China tribe, for which the addition of sand and leaf-mould will be necessary.

THE ROYAL DUBLIN SOCIETY.

WINTER SHOW.

The annual winter show of the Royal Dublin Society was held in the Society's new hall, Kildare-street, Dublin, on Tuesday and Wednesday, November 23rd and 24th. The exhibition of farm produce, as usual, occupied the most prominent place; whilst the show presented a new feature, or rather the revival of one which was abandoned two years ago, in consequence of the want of accommodation—namely, an exhibition of fat stock, together with poultry. A portion of the building was also set apart for the use of implement makers; but there were no prizes awarded in this section.

Following the order of the prize-sheet, we commence with the cattle classes, and of these the first, three including two and three-year-old shorthorned bullocks and Devon oxen of any age, were vacant, the first in the yard being two very prime West Highland oxen, one of which was three years old, and the other four years old, belonging to Mr. Allan Pollok, the celebrated Galway proprietor. The first prize was awarded to the former, both being a pair of capital bullocks well covered with firm flesh. Strange to say, only one animal claiming to be of the Kerry breed was shown, and this a nondescript ox, over three years of age, in low condition, and certainly not a Kerry. This was shown in the class of oxen "of any other breed, calved prior to 1855;" and beside it stood a thick cross-bred ox, uncommonly well covered in all his points, belonging to Mr. Pollok, which, of course, got the prize. The latter also showed a splendid lot of three cross-bred bullocks in the next class—Class 7—two of which were three-year-old, and one one-year-old. One of the three-year-olds, a roan bullock, was a magnificent animal, and to this lot also the prize was awarded. In class 8, "lot of six bullocks, under four years old, not competing in any of the foregoing classes," Mr. Pollok was again the exhibitor of six Scotch polled cattle, which, although not quite so prime as his West Highlanders and his roan bullocks, were good useful stock, and as such were eagerly scanned by intending purchasers. The prize for the best of all the fat oxen was also awarded to Mr. Pollok. In the class for shorthorned cows, of any age, Mr. J. O. G. Pollock, of Mountanstown, county Meath, got first prize for his cow, and Mr Allan Pollok second. Both animals were highly bred, and in extraordinary condition, but rather patchy. Their were no Devon cows in their class; and in West Highland cows, of any age, Mr. Allan Pollok was commended for a rather nice aged cow, but there was no medal awarded. Of Ayrshires there was also only one specimen—a thin cow from the "Albert Model Farm," not of sufficient merit to obtain even a commendation. A sweet little four years old Angus cow belonging to Lord Talbot de Malahide was commended in its class, but no prize was awarded. Neither Herefords nor Kerrys appeared in

their respective classes. Of the "lot of three cows of any age or breed, not competing in any of the other classes," Mr. Sam. Garnett got the first prize; and Sir E. M'Donnel's lot was commended. There was nothing particular about either, being simply "fed on grass, without either turnips or oilcake," as was stated in the entry, and nothing beyond what might be seen any Thursday in the Dublin market. In shorthorned heifers under four years old, Mr. Allan Pollok showed one which was decidedly the best in the exhibition, aged three years, a prime handler, and perfect in all the best parts. Her back and quarters were particularly good. Sir E. M'Donnel got the second prize in this class. In West Highland heifers, under four years old, Mr. Allan Pollok was again the winner of first and second prizes in the class with two very nice beasts. Mr. Allan Pollok's Scotch polled heifer, 28 months old, was merely commended, when it ought to have got the prize, although there were no other competitors in the class. In heifers of any age or breed, not competing in the other classes, Mr. Allan Pollok obtained the first prize with a very fine and highly-finished two years old cross shorthorned heifer; and Mr. Barton, of Straffan, got the second medal. The next class comprehended lots of "three heifers of any age or breed" not entered in any other class; Mr. S. Garnett etting the medal, Sir E. M'Donnel's lot a high commendation, and Mr. Allan Pollok's lot being commended. There was nothing in the animals shown in this class which calls for special remark.

So much for the cattle. And we would merely observe, in passing, that the Royal Dublin Society must feel itself placed under particular obligations to Mr. Allan Pollok, whose entries amounted to exactly one-half of the entire number, and whose cattle—all bred by himself—were nearly all of a kind which would have entitled them to notice at any show. In fact, without his entries, the cattle department of the exhibition would have been a failure—a rather remarkable circumstance, some may think, when it is remembered that cattle breeding is the chief object with the majority of Irish farmers.

As a whole, the show of sheep can only be characterized as middling, and very far short of what ought to have been the case, both in number and quality; while to several of the lots we must apply the term indifferent. Our remarks, therefore, need only enumerate the prizes awarded. In the class of long-woolled widders, under thirty-four months old, Mr. H. M. Twite, Sonna, got the first prize, the other lot shown in the class not having sufficient merit for the second medal. Sir Percy Nugent was the winner with one of his lots of three and six long-woolled widders, not competing in the other classes; but the second medal

was not awarded to either of his other lots in the same class, he being the only competitor in both cases. Of short-woolled waddlers, under thirty-four months old, Mr. Twite's lot got first, while Mr. C. Hamilton's pen of Shropshires came in second. Mr. J. O. G. Pollock's lot of three short-woolled waddlers—evidently crosses—exceeding thirty-four months old, were passed over with a commendation, although there was no other competitor. The prize for the "pen of three short-woolled sheep of any age or breed, not competing in the other classes," was got by three sheep of no distinct breed, belonging to Lord Talbot de Malahide. Mr. Twite got the first prize in the class of six short-woolled sheep of any age, with a fair but unequal pen of Downs, whilst the second prize was taken by a lot of grass-fed Cheviots belonging to Mr. Samuel Garnett. In the next class, that of six sheep of any age or breed, Mr. Owen, of Blessington, showed the best lot in the entire sheep department; to wit, a pen of six pure Leicester ewes, bred by the exhibitor, and to which the first prize was most deservedly awarded. The second pen on the list in this class belonged to Mr. Twite.

The department comprising the various classes of fat swine was restricted as to numbers, but the animals shown were all good of their kind; indeed, there has been a more generally marked improvement in this than in any other class of livestock in Ireland, and the consequence is that the turn-out at the different shows is very creditable. The first class in this department included pens of "three pigs, small breed, under ten months old"; and the first prize was awarded to a nice lot sent from the Albert Farm, pigs being the only thing which the conductors of that national institution can bring out successfully. Dr. Radcliff, of Cliff Lodge, got the second prize in the class. In the next class, three pigs, small breed, not exceeding fifteen months old, Dr. Radcliff was the only competitor, and got the prize. In single pigs, small breed, of any age, a capital Cumberland sow belonging to Lord Lurgan got the first medal; whilst Dr. Radcliff's entry was second. A pig bred by His Royal Highness the Prince Consort, and now belonging to the Albert Farm, was beaten in this class. The Albert Farm won the first prize in the class comprising three pigs large breed, over twelve and not exceeding eighteen months old, the winning pen being a very good lot of Yorkshires. Another excellent lot of Berkshires, belonging to Dr. Radcliff, was second in the class. Of single pigs, large breed, of any age, the first prize was taken by a splendid Berkshire belonging to Mr. Bruce, Milntown Castle; and the second by a cross between the Yorkshire and Cumberland, the property of Lord Lurgan. An enormous, but coarse Berkshire sow, three years old, belonging to Mr. Joyce, of Abbey Farm, Waterford, was commended.

The poultry section of the exhibition extended to 103 entries, being too few as far as numbers were concerned, but quite enough, taking general quality into consideration. The best classes were the Dorkings, amongst which there were several very fair lots, especially the prize fowl exhibited by Lord Lurgan and Messrs. Williams, Forrest, and Maddocks.

We now come to the exhibition of farm produce, which occupied three wide tables, each extending the entire length of the hall. With many very splendid specimens, the whole was, perhaps, scarcely up to the mark of former years; but some idea of it may be formed when we state that two of the exhibitors—Dr. Radcliff and Mr. Vernon—had each respectively 81 and 73 entries, several of which, of course, were duplicates. The Earl of Charlemont also sent a large collection of magnificent roots and cereals, but not for exhibition; and Mr. Allan Pollok showed specimens of the various crops grown by him at Lismanny, near Ballinasloe: thus:—Of white wheat above 800 acres; barley above 80 acres; field beans above 100 acres; turnipseed (Swedish) 7 acres, Skirving's (purple top) seed 4 acres, Aberdeen yellow seed 3 acres; roots of long red mangel on 90 acres; swede turnip roots on 1,200 acres; Skirving's (purple top) on 400 acres; white cabbage on 50 acres; in all 2,734 acres, and this only from one part of his estates.

The best sample of white wheat, which was shown by Mr. James Burke, Stapolin, weighed 64 lbs. per bushel. This was an exceedingly beautiful sample. The second lot, which weighed 61½ lbs. per bushel, was exhibited by Mr. Putland, of Bray. The best sample of red wheat, belonging to Dr. Taylor, of Newton Mount Kennedy, weighed 62½ lbs. per bushel; and the second, exhibited by Mr. Barlow, weighed 61 lbs. The best sample of barley was a particularly nice, good-coloured lot, weighing 53 lbs. per bushel, exhibited by Mr. James Trim, co. Wicklow. The second lot, which was shown by Mr. Mill, Donalbate, was much inferior. Both the first and second lots of white oats weighed each 43 lbs. per bushel, and belonged respectively to Dr. Collins and Mr. Perry. The prize samples of black oats were also alike in their weight per bushel, viz., 40 lbs., the exhibitors being Mr. Mill first, and Mr. Perry second. In the section of field beans the first prize lot, belonging to Dr. Radcliff, weighed 65 lbs. per bushel; and the second lot, exhibited by Lord Talbot de Malahide, weighed 64 lbs. A more beautiful sample than either, grown by the Hon. H. Sugden, was unaccountably passed over. Dr. Radcliff's sample of field peas—partridge variety—got the first prize in its class; and a bag of Gillet's early prolific goldfinder, shown by the Duke of Leinster, was second. Neither of these was of extra quality. Dr. Radcliff and Dr. Taylor stood respectively first and second in vetches. Of flax seed the samples exhibited were particularly good, the first prize lot, grown by Mr. D. Patten, Glaslough, being particularly so. The second in this class was exhibited by Mr. Boyle, Springfield House, Leeds. The prize for Irish-grown mangel seed was awarded to a very superior sample of long red, grown and exhibited by Messrs. Dickson, Farrel, and Co., Belfast: the same firm stood first with their Irish-grown turnip seed—East Lothian purple top—followed by a sample shown by Mr. Allan Pollok.

In the minor classes of bulbs, Dr. Radcliff and Mr. Vernon stood first and second for kohlrabi;

and Mr. Vernon, Mr. Barlow, and Mr. Forrest respectively first, second, and third, in onions. Dr. Radcliff's crop of kohl-rabi was stated to have produced 40 tons per Irish acre.* The quality of the potatoes shown was very good, Mr. Barlow being first, and Dr. Taylor second and third, in the section of matured potatoes. Mr. Barlow's produce was stated to have been 17 tons per Irish acre—the variety Regents; and Dr. Taylor's 100 barrels or $12\frac{1}{2}$ tons per acre—variety White-rocks. The seedling sections contained several entries, Dr. Taylor and Mr. Mason, Dublin, being the prize-takers.

We now come to the large root classes, specimens of which have been so much admired in former years, when exhibited by the Royal Dublin Society in Baker-street; and we learn that at the coming show of the Smithfield Club a similar collection will again be found, under the management of the Society's zealous curator, Mr. Andrew Corrigan.

In long red mangel the first sample belonged to Dr. Radcliff, and the six roots weighed 138lbs.; 45 tons of farm-yard manure, with half a ton of salt per Irish acre, were employed in growing this crop, and the weight of the produce was stated to be 72 tons per Irish acre. The second prize was awarded to Mr. Vernon, whose six roots weighed 130lbs.; 40 tons of farm-yard manure; produce, 82 tons. Mr. Barlow's six roots, weighing 114lbs., were awarded the third prize. In long yellow mangel, Mr. Vernon got the first prize with six roots which weighed 132lbs.; acreable produce 84 tons: and Dr. Radcliff's sample came in second. In red globe mangel the prizes were awarded in their order to Mr. Vernon, Dr. Radcliff, and Mr. Forrest; Mr. Vernon's sample weighing 119½lbs., and Dr. Radcliff's six roots 115lbs. In yellow globe mangel Dr. Radcliff showed six roots which weighed 147½lbs., and to which the first prize was awarded. Mr. Vernon's, second prize, weighed 119lbs. Mr. Hutton's, third, weighed 107lbs. In sugar beet Mr. Vernon's six roots weighed 80lbs.; and Dr. Radcliff's 78lbs. The prizes were awarded accordingly; a heavier lot than either, which weighed 113lbs., being rejected by the judges on account of coarseness. The red carrots shown were not good; whereas, in former years this section was always well filled. The prize was awarded to Lord Talbot de Malahide's sample. Of white carrots there were several good lots, the three prizes being awarded in their order to Mr. Congreve, county Waterford; the Marquis of Kildare, and the Marquis of Waterford. The show of parsnips was also very good; Mr. Putland's lot, first prize, being uncommonly large, and, at the same time, clean grown. The second and third prizes were taken by Mr. Forrest and Dr. Radcliff.

Of turnips, there was a very fair turn-out. Dr. Radcliff's swedes (first prize) were grown on 28-inch drills, ridges, with 35 tons farmyard manure and $\frac{1}{2}$ ton salt per Irish acre. Mr. Vernon's swedes (second prize) were grown on 30 tons farmyard manure; weight of crop, 45 tons per Irish acre. Mr. Allan Pollok's swedes (third

prize) were grown on 30 tons farmyard manure and 5 cwt. guano per Irish acre. In Aberdeens, the Marquis of Kildare got the first prize with a sample of his crop, grown on 20 tons of dung and 3 cwt. guano per Irish acre; whilst the Duke of Leinster's sample—grown by Mr. Chapman, Mogaddry Farm, and sown on the 18th of July—was the winner of the second prize; the third prize being awarded to a lot grown by the Hon. R. G. Talbot, sen., about the 20th of May. In white cabbage, Dr. Radcliff stood first, and Mr. Allan Pollok second. The four cabbages sent by the last-named gentleman was a sample of the crop grown on 40 Irish acres with 35 tons of farmyard manure and 4 cwt. of guano per acre, the crop being 100 tons per Irish acre. In red cabbages, Mr. Vernon and Dr. Radcliff were the successful competitors.

There were very few samples of flax shown, which was not at all creditable to the spirit of the growers of this valuable plant in the North of Ireland. We expected a large exhibition both of hand and mill-scuted, but our expectations were not realized. Mr. Patton, Glasslough, was the winner of all the prizes in the class.

The number of entries of butter was very limited, but the quality was superior. The successful exhibitors were Mr. Patton, Glasslough; Mr. M'Grath, Castle Meddery; Miss Butler, Castle Ruddery; and Mr. Fawcett, Glaneely.

Dr. Taylor was awarded prizes for fleeces exhibited by him, being, in fact, the only competitor.

It is very strange that in those articles for the production of which Ireland has a name in the market—namely Kerry cattle, flax, butter, and wool—the exhibition should have been so poor as it was; and we commend these points to the future consideration of the society.

We regret having observed a great falling-off in the quantity of roots sent from workhouse farms, but this has been entirely owing to a most absurd alteration in the rules of competition made some two years ago; and from the manner in which it was done, workhouse agriculturists have been disgusted, and now decline sending specimens, when they will not be allowed to compete with the general body of competitors, or, if so, when they can only win an honorary distinction—that is, a third prize—no matter how good their specimens are! For the largest and best collection of produce grown on farms connected with public institutions, the first prize was awarded to Mr. Kavanagh, agriculturist to the Tullamore Union Workhouse; the second to Mr. Flood, agriculturist to the Lismond Union Workhouse; and the third, to the Antrim Union Workhouse Farm. We hope that the society will see the propriety of putting these deserving men in future on an equal footing with the general body of competitors, instead of marking them out as a species of agricultural pariahs.

The Board of National Education sent several specimens of produce from their school farms; while, owing to an alteration in the day of adjudication, several intending competitors were too late in sending forward their specimens. Amongst these we noticed a splendid lot of

* The Irish acre contains 7,840 square yards, being 3,000 yards over statute measure.

mangolds from Col. Tighe's farm at Woodstock, Co. Kilkenny.

The implement makers who occupied stands were Messrs Richmond and Chandler; Thomas Bradford, Manchester; John Hardley, Shide, Newport, Isle of Wight, gorse-grinding machine; John Maguire, Dublin; R. B. Lee and Co., Dublin; John Twite, Dublin; Joseph Woufor, Dublin, artificial manures; Thomas Keenan and Son, Dublin; Clayton, Shuttleworth, and Co., Lincoln; Garrett and Sons, Saxmundham; James Banks, Liverpool; W. and J. Ritchie, Ardee; Picksley, Sims, and Co., Leigh; J. J. Mitchell, Dublin; J. W. Mitchell, Dublin; Alfred Nixon and Co., Liverpool; David Rogerson and Co., Dublin, agents for Long's

Specific, and blood manure; and Joseph Booth, Dublin. Mr. Macdona, Dublin, exhibited several lots of Irish frieze, and Messrs. Dickson, Hogg, and Robertson, Dublin, had a tastefully arranged stand, on which was exhibited a collection of cereals and grasses, conifera, and green-crop roots, not for competition. The hall was also decorated with beautiful plants from the Botanic Gardens of the Royal Dublin Society, and also from the gardens at Marino, the seat of the Earl of Charlemont. The weather although cold was dry, and the hall was visited on both days by a large assemblage of visitors, amongst whom were his Excellency the Lord-Lieutenant, Lady Eglinton and suite.

IMPROVEMENT OF AGRICULTURAL LABOURERS.

STR,—I need hardly say to you that the condition of the agricultural labourer is not any new subject of consideration to myself; it is now many years ago that I first called public attention to it and took a rather active part in exposing the evils of that condition, suggesting remedial measures. What is called philanthropy was not then the fashion of the hour; on the contrary, although the grievous evils of the labourer's condition were in many matters admitted, they were considered dangerous to discuss openly; we were warned of the inflammable nature of this class, the great necessary exposure of property to its malevolence and revenge. Those were the days of Swing riots, incendiarism, machine-breaking; days of things done by masters, suffered and revenged by men, which it would be no service now to rake out of the ashes of the past. Quickly upon that disastrous season the force of public opinion, a little perhaps impelled by the agency of such so-called dangerous men as myself, and others taking the same views, compelled our legislators to look more accurately into the state of this class. It was not a case for blue-books and paid commissioners, but for the exercise of their own common sense, common powers of observation. It was soon seen that something more was wanted than stringent Poor Lawism, improvement of the constabulary, more schools, more churches, more moral and legislative "plant."

Providence by the "cholera" forced consideration into action in the matter of the health, the physical and therefore the social condition of the town poor. The nation awoke to the belief that if there was direct indisputable connexion between disease and filthy crowded dwellings, there was an undeniable connexion between crime's early and late life, and the nature of the spot on which it first drew and last parted with its breath. The sanitary campaign was begun in earnest; some of the ablest heads, most unwearying pens, plunged at once into the Augean sphere, and there they dived, digged, analyzed, and rioted amid every complication of disease-begetting matter and manner of life; they tasted foul water, they smelt the foulest matters, they forced the chymist and the microscopist to join them in their labour; they would know of what it all was composed, into what it all evolved, to what gases it gave freedom, to what happy insect infusorial life it gave birth to nourish and to multiply.

The labourer of the country now found friends who obtained a partial hearing when his sanitary condition was offered for discussion. It was proved in your columns and elsewhere that his dwelling, almost as the rule, forbade every decency of life;

was so crowded, so constructed, that if he was healthier than the town labourer it was because he was fewer hours confined to the foul air of his home. We contrasted the school and church, the lessons there taught, with the one bedroom and the experience to be there gained; we asked for proof of the slightest consideration for modesty, decency, or health in the avowed condition of the majority of the dwellings of farm labourers; we pointed to improved stabling, styes, sheds, kennels. Were we so very wicked and mischievous when we would have landowners regard their men with the consideration they gave to their beasts? Perhaps I, for instance, drove the nail home too fast, too hard; I might have been more patient, more reasonable in my strictures on this subject; if I had preached treason, written blasphemy, I could scarcely have been more abused. I am to this day impenitent in the matter; for I believe I and others so abused have had our reward.

Facts bore down opposition; the truth defied prevaricating denial; Peers and squires began to look the matter in the face, instead of simply cursing those who had stirred it. The labourer's improvement *look*, became one of the "ideas" of an age of progress; Pritchard and Peirce stooped to study the domestic economics of the peasant; free-trade made improved cultivation of the soil imperative. This was a matter in which scientific practice required the aid of complex machinery, and the intelligence in the labourer necessary for its use. Emulation in farming made the farm and its details open to criticism; shame compelled some, real good but late-awakened feeling others, to build better cottages. It was found the bettermost men on the farm reared better families as their dwellings gave them fair power to do so; it was argued, men less good would become better if dealt with in a better spirit. The cause prospered under high patronage, the high pressure of the now thoroughly roused public opinion. I now scarce go anywhere but I see new cottages built with all desirable regard for the comfort and decency of the labourers who inhabit them. There is room yet for much more cottage-building even in fortunate districts; there are yet, alas! many districts in which all the old evils are in full force, but I very seldom meet with a landholder who does not regard the question in its true light; there are few, who have any means at their command, who do not do something to improve the dwellings of their poor; there are some bright examples among our territorial magnates of cottage-building on a most extensive scale, and with a care for the details and expense of construction above

all praise. It must be a work of time; for it is a most expensive work on some estates; but the "cause" has its impulse, and I have little fear but the next generation will see the poor man as a *rule* treated in the matter of his dwelling as we would desire. For my present purpose it is sufficient for me to claim the conclusion that thousands of labourers are better lodged than they were a few years since; that there is a growing disposition among landowners to regard proper dwellings for the poor in the same important light as proper homesteads for their tenants.

Assuming, then, the house to be better, how is the cupboard furnished? what about the wages? Within the sphere of my own observation I see here, too, a great improvement: although wages may not have increased numerically as to the shillings due on Saturday, the shillings received go far further to furnish the week's necessaries, the Sunday's extra diet; clothing as well as bread is much reduced in price; shoes keep up, but modern farm work reduces the average expenditure of a family's shoe leather, so much labour being now done with little comparative travel. Again, the large and increasing amount of land under cultivation, and the never-ceasing cultivation of every inch of it, has created a demand for more hands, at the very time extensive emigration is reducing their numbers. This, if it gives the men—the single men—a spirit of independence, at times locally inconvenient, acts as a wholesome drag on any downhill course of wages on the ground of "low prices."

So far from machinery, in its present extensive application to farm work, having decreased the demand for manual labour, it has called for more hands; more stock are kept, and all sorts of stock are tended with more care; the variety of the food given, and its different forms of preparation, have made a great call for "hands." The steam engine may do a good deal of cooking and carving for the flock, the sheds and styes, but there are many *made dishes* which require hand labour to work the instruments by which they are prepared. The waiting on the animals is also hand labour. Let me add, in passing, that the order and method of good farming, the close acquaintance with complicated machinery, the necessarily acquired knowledge of the details of a farm, worked with the skill and capital of a factory, has an inevitable good moral effect upon its "hands." It is said footmen become butlers, butlers gentlemen, by diligent observation of the machinery of refined life; so the most raw and stolid of farm youths by degrees has his eyes opened to see, and his intellect excited to understand the value of these processes, and the nature of the machinery by which they are accomplished. There is always a premium before his eyes in the value he beholds given to those of his class who, by their steadiness and docility, learn enough and become trusted enough to take charge of particular departments requiring those qualifications. After all that machinery can do on the surface of the soil, there remains yet in the field and at the barn a great deal for men, women, and almost children to do. The large family is not the curse it used to be thought. True, the shoe bill is heavy, the assaults on the cupboard many and difficult to meet; but, with an ordinary share of health, *if drinking and waste are excluded from the household*, the earnings of a family not only meet its wants better than I ever knew them, but leave the margin I love to see for a certain amount of occasional indulgence in pleasures and tastes not only wholesome, but leading to positive good.

The truck system is, I hope, fast passing away; the men are now, with little exception, paid their earnings in money; if they take any part in corn, it is at their own option that they do so. Here and there a few employers may be found

who expect their labourers to take "tailing" wheat of them at more than it would fetch in the market; they are generally of a class whose days as tenant-farmers are numbered, for they are far in the rear of that intelligence by the exercise of which a renting occupier of land can live.

I must yet say a word or two on the all-important question of the labourer's education. From the very nature of things, the time in which the children of this class can be "schooled" is very limited. They are born to an inherited avocation; where the nailed shoe of the father has trodden the little leathers of his boys must early learn to tread. Out-door employment demands very early acquaintance with exposure to weather; the feet and hands must be hardened; the constitution given a power to endure the extremes of heat and cold—the liability to that but little intermitting damping which our climate inflicts. To read with ease, to be master of simple rules of arithmetic, to write a plain hand, to be grounded in religious truth and in a good general knowledge of Scripture, to have a boy's idea of the earth in outline, as maps may give it—this is nearly all that can be hoped from any system of schooling in a purely rural district; add to this, habits of obedience and decency, control over the tongue, and an aim at strict honesty, and you have obtained all you could with reason expect. The infant-school must form the base of the work, which the more advanced school and Sunday-school must complete. The farm lad is now, so far as he can be, intellectually "finished," and he goes at once to "bird-keeping," or other work of his apprenticeship. In the winter season night schools, if well managed, will, at all events, do much to prevent the loss of the learning gained as above; with boys of superior intelligence it will do more.

Managers of these schools must remember that these lads must be *led* to work; as children they were *made* to do so. Cheerful, pleasant teaching, ready tact in offering that which will amuse while it instructs, is the great secret. The pupils are often very tired, very sleepy, and yet I have seen them induced to work with a zeal and a result that have astonished me. Those who taught them made it a labour of love, they received teaching in the spirit offered. I have known some throughout a winter walk miles to meet their "young lady" teachers, and by their good conduct amply repay the pains bestowed upon them. Far more can be done, and is done, in the girls' school; they can be kept there longer, and much of manual labour, useful, nay, necessary for them in after-life, can be, and is generally taught to them.

I lately in your columns spoke of the mechanics as a reading class. I can say with truth the agricultural labourer now draws much from books; instead of being deluged with gratuitous tracts—many good, very many far beyond his comprehension—he has now, with a good share of religious literature, a great amount of useful purely secular reading, rendered cheap that he can buy it, plain in construction that he can understand it. Pictorial illustration has great charms in a cottage; it helps out the reader, interprets to those who cannot read. Just as in the higher classes we take books of value number by number, so now it is very common for the labourers of the rising generation to subscribe weekly or monthly, as it may be, for some of the many excellent illustrated serials which the hawkers bring to their doors. It is no unusual thing to find in many villages a great and increasing demand in this way for really good books. Trash may be bought at "a fair," but I see little of it now about. There is a great improvement also in the pictures on the wall and teatray; I only now know of one "Prodigal Son" in topboots and a red coat, and the very "loud" flirtations pictured as between the gentleman in uniform and the lady in riding-habit

are fast giving way to really good specimens of cheap painting and engraving. Who, too, has not marked the improvement in the dress of the labourer—his Sunday dress?—no bad criterion of his well doing. All this proves to me matters are rapidly improving. Drunkenness is still the curse to the men, love of dress to the young women: with regard to the latter they are scarcely more foolish and extravagant than their betters; as to the former, I have hope yet that Bible and books will beat the beershop.

Let the upper orders rule more *by example*, and they will find they rule better. True social science lays down, among its

principia, that those who have received most have the most to give; the rich man's library, his education, his position, are to this degree the property of the poor man, who has few books, has had little teaching, and lives from hand to mouth; he has—when told the value of learning and religion, of sobriety and chastity, of honesty and industry—a right to see the evidence of all this in the life of those who are possessed of the sources from which it is derived.

I feel, Sir, I have trespassed too far on your patience: it is an old and favourite subject of your now old correspondent
—Times. S. G. O.

ON THE INFLUENCE WHICH THE INDIVIDUAL CONSTITUTION OF PLANTS EXERTS UPON THE SEED.

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In the matured plant we have the final result of the action of all the causes which influenced its growth. These causes may be classed under three categories: cosmical, agrolological, and morphological. To the first belong the several influences exerted by the mean distribution of heat, the temperature, the amount and distribution of rain, the variation in the amount of vapour in the atmosphere, the amount and quality of the sun's rays, the relation between the period of flowering and the length of the day. By agrolological causes, I mean the influence exerted by the special mechanical and chemical qualities of the soil in which the plant grows. The third class of causes includes: 1. The action which the *specific* morphology of the plant,—that is, the structure which it has in common with all the individuals of the species,—exerts upon the chemical and other changes occurring during growth; 2. And that exerted by the *individual* morphology, or the peculiarities of structure which each individual exhibits. These causes are not of equal generality; the order is, indeed, the reverse of that in which we have enumerated them.

It so happens that the relations between the chemical constitution and the *individual* and *specific* forms of plants, hitherto, received very little attention, the former, indeed, none at all; and yet phyto-chemistry, especially from an agricultural point of view, should be based precisely upon a knowledge of the action of those causes. Impressed with the great importance of tracing this connection, I have attempted some experiments, which, although of a very fragmentary and not very conclusive character, may help to call attention to one of the most important subjects of

inquiry, whether judged from a purely physiological or agricultural point of view. I shall begin with the individual morphological structure.

In the years 1852 and 1853, I made, in the Museum of Irish Industry, in conjunction with my friend Mr. A. Gages, several hundred analyses of the bulbous roots usually cultivated. The results of these analyses led to the important conclusion, that the difference in the amount of water between the large and small roots, grown under similar conditions, in the same field, was generally greater than that produced by the action of different manures; a result which necessarily invalidated all experiments upon the comparative action of different manures upon turnips, beets, potatoes, &c., hitherto made, in which the influence of size was not taken into account, and this had been almost never done.

The proportions of water, ash, and nitrogen, were determined upon a slice cut, in one series, from the centre of the root and at right angles to the axis; and in another series, in the direction of the other axis. Mr. A. Rehring, of Edderitz, having, however, shown that the amount of sugar contained in different parts of a beetroot varied, being at a maximum in the thickest part of the body, and diminishing upwards and downwards, it appeared to follow that the percentage of solid matter, determined from the cross sections, would be sensibly higher than the mean of the whole root, and that from the section along the axis, sensibly lower than the mean. This distribution of the sugar is more or less in accordance with the structure of the bulb, which consists of alternate layers of vascular and cellular tissue, the sugar being contained in the latter,^s especially in

those cells close to the vascular tissue. A larger proportion of such cells would, of course, occur in the thick body than at the point of the root. A considerable portion of the azotic substance being found in the vascular tissue, it struck me that the law of distribution for the other proximate principles of the root might not be the same as that for sugar. With the view of determining this point, I made, during the last Autumn and Winter, the following experiments:—

I.—A root of long red mangel wurtzel, weighing 9lbs. 15oz., and measuring 19 inches in length, had five cross sections cut from it, which gave, when dried, the following results per cent.:—

	Solid matter.	Water.
1. Segment of crown, half-inch thick,	11.64	88.36
2. Segment of body immediately below the crown,	11.09	88.91
3. Segment of body three inches below section No. 2,	10.28	89.72
4. Segment of body four inches below section No. 3,	11.17	88.83
5. Points of root or forkings,	12.85	87.15

II.—A root of white Silesian, or sugar beet, weighing 6lbs. 11oz., and measuring 14 inches in length, similarly cut, gave per cent.:—

	Solid matter.	Water.
1. Segment of crown,	7.55	92.45
2. Segment of body, half-inch below crown,	8.75	91.25
3. Segment of body, taken three inches below No. 2,	10.45	89.55
4. Segment of body, taken three inches below No. 3,	11.55	88.45
5. Point of root, two inches long,	12.13	87.87

According to these results, the maximum amount of solid matter is in the thin part of roots, which, according to Rehring, contains but little sugar. When the quantity of sugar is very considerable, the maximum may, however, be in the thickest part of the root.

The relative diminution of solid matter, as the size of an organ increases, appears to be a universal law within certain limits; and the proportion of nitrogen follows the same law. The young buds, just before bursting into leaf, contain more solid matter and nitrogen than when fully unfolded. In the case of cabbage, I have found, in two instances that I tried the experiment, that the increase of water, from the young heart leaves to the external ones, was quite regular. Large roots sometimes appear to form an exception to this law by containing more nitrogen than the smaller roots. Part of this nitrogen is often, however, derived from nitrates and ammonia—the quantity of the former being always greater in large than in small roots. It would appear, too, that part of the azotic bodies is expended during the produc-

tion of the sugar, and that, consequently, the less sugar that is produced, the less of the azotic bodies will be lost.

Being desirous of ascertaining how far this gradual increase in the relative amount of solid matter, towards the narrow parts of the roots, would influence the difference between large and small roots, which former experiments, made in the Museum of Irish Industry, had established, I recently undertook to make a new series of determinations, not upon a segment of the root as before, but upon the whole root. Although it is now universally admitted that large roots contain more water than small ones, yet it seemed to me to be worth incurring the labour of this new series of determinations, if for no other purpose than to ascertain the actual condition of our green crop husbandry as regards quality. The results of this inquiry, which extended to nearly all the kinds of root crops now cultivated in Ireland, and in which much care was taken in getting average samples, will be found in the annexed table. Besides the actual determinations of water and solid matter, the results of which are given in the table, I made a series of determinations of the density of a great number of other roots, by a process to be described further on. So that, although but two roots from each locality were dried, these were selected as representing the average, as determined by the density of, perhaps, in some cases, twenty roots. The table may, consequently, be considered to express the present average quality of Irish-grown roots, and will serve as a standard by which to determine the future improvements in the quality of our green crops, for which, indeed, there appears to be much room. Hitherto, all the efforts of husbandmen seem to have been directed to quantity and none to quality. This is abundantly proved by the circumstance that the only test recognized at shows of agricultural produce, for determining the comparative merits of the specimens of turnips, &c., exhibited, is weight. It is to be hoped that henceforward some better test than this will be introduced, and that prizes be awarded for improving green-crop husbandry, and not for deteriorating it, as the present forcing system but too often tends to do.

However important the object above mentioned may be, it was not the immediate one I had in view in making this new series of determinations. That object was connected with the subject of this paper, and which I shall now enter upon.

An examination of the table alluded to, shows that, although large roots almost invariably contain less solid matter than small ones, thus confirming the results of former experiments made upon segments and not upon the whole root, equal differ-

ences of weight between large and small roots are very rarely accompanied by equal differences between the amounts of solid matter; and this is not only true of all roots compared together, but even in many cases of roots grown in the same field under, as nearly as possible, similar conditions, as we shall see presently. To give a few examples from the table:—

The greatest observed difference of solid matter (10.81) is attended by a difference of weight of only 2lbs. 8½oz., while the greatest difference of weight observed between two roots grown together (10lbs. 4oz.) shows a difference in percentage of solid matter of only 2.40. A nearly equal difference of weight in another case (9lbs. 15½oz.) gave a difference of solid matter of only 0.17 per cent. To what are we to attribute these extraordinary variations? If the experiments had been limited to a few specimens, they would be set down, most probably, to the action of the soil and manure; and no doubt both causes may have contributed to the result. But as similar variations, and sometimes to as great an extent, may be observed among roots grown under precisely the same conditions as to soil and manure, it is evident that an initial cause of difference must have existed in the germs from which they were produced. I was led to this opinion by observing that roots grown from inferior, and especially from mixed seeds, but under precisely similar conditions as to soil and manure, varied very much in their composition, and did not follow exactly the law of size; while good, uniform, and fully ripened seed invariably followed that law. The following examples will illustrate this:—

I.—White Silesian beet, grown upon a strong clay soil, and manured with matter from cesspools and sulphate of ammonia.

MIXED INFERIOR SEED.

Weight of Root.	Percentage of Solid Matter.
13 lbs. 4 oz.	8.75
12 „ 7½ „	6.43
10 „ 5 „	9.75
8 „ 11½ „	9.92
5 „ 13½ „	7.52
3 „ 0 „	12.74
2 „ 10¾ „	10.42
1 „ 12¾ „	10.42

GOOD UNIFORM SEED.

Weight of Root.	Percentage of Solid Matter.
7 lbs. 10½ oz.	11.94
6 „ 12¼ „	12.32
6 „ 6½ „	12.80
6 „ 2½ „	13.00
4 „ 3¾ „	14.32
2 „ 6½ „	16.92
2 „ 12½ „	14.56
1 „ 15¾ „	15.48

II.—Long red mangel-wurtzel grown on a light clay soil, and manured with farmyard manure.

MIXED INFERIOR SEED.

Weight of Root.	Percentage of Solid Matter.
7 lbs. 6¼ oz.	12.92
7 „ 5½ „	6.94
6 „ 15 „	12.49
2 „ 8 „	16.33
1 „ 2½ „	15.99
0 „ 10 „	14.30

GOOD UNIFORM SEED.

Weight of Root.	Percentage of Solid Matter.
8 lbs. 6¾ oz.	12.84
6 „ 11¾ „	13.03
3 „ 4 „	15.20
1 „ 5 „	14.80
1 „ 5½ „	15.86
1 „ 4¾ „	16.96

It would appear, however, that, although the initial cause of variation from the law of size is resident in the germ, the soil and manure may increase or diminish the amount of divergence.

The ordinary seed used by husbandmen is rarely the seed of plants grown upon the same kind of soil and with the same kind of manure, that is, under more or less analogous conditions, but rather a mixture of seeds from different localities and produced under the most various circumstances. If then, there be really an initial cause of difference resident in the germ, we have a sufficient explanation of the difference which any one may observe between the quality of roots grown in the same field. Now an important question suggests itself, namely, is the initial cause of difference in seeds hereditary, or in other words, is it derived from the peculiar qualities of the plants which bore it? If this be so, the seed of each plant must transmit more or less of its individual qualities, as well as the specific ones, to the plants which they will produce, subject to the modifying influences of soil, manures, climate, &c.

One of the most striking differences in quality, which roots exhibit, is that of relative amount of solid matter—a difference which may be determined by ascertaining their specific gravity; the roots containing least water being densest. I therefore determined to try whether this property of density could be propagated. For this purpose I selected three roots of white Silesian beet of nearly the same size (2lbs. 6oz. to 2lbs. 7oz.), but exhibiting as great a difference in specific gravity as possible. I determined the specific gravities by means of a series of solutions of common salt, indicating differences of specific gravity equal to 0.005. I employed eleven solutions placed in wide-mouthed jars, numbered from one to eleven.

The following table gives the specific gravity of each:—

No. 1	. . . 1.025	No. 7	. . . 1.055
2	. . . 1.030	8	. . . 1.060
3	. . . 1.035	9	. . . 1.065
4	. . . 1.040	10	. . . 1.070
5	. . . 1.045	11	. . . 1.075
6	. . . 1.050		

The root, whose specific gravity was to be determined, having been washed, was plunged into each successive solution until it floated fairly. We shall suppose a root sinks in solution No. 5, but floats in No. 7; its specific gravity may be considered as the mean, or 1.050; it ought consequently remain for a moment in any part of No. 6 solution, slowly rising towards the surface, if its specific gravity lies between 1.045 and 1.050, or sinking if it be between 1.050 and 1.055. For all practical purposes intervals of 0.005 are quite enough.

The roots, whose specific gravities were thus determined, were planted and allowed to produce seed, which was sown, and the roots produced from them examined. The following table gives the weight of roots grown from parent seed, and percentage of solid matter:—

Sp. gr. of parent root.	1.070	1.050	1.030
WEIGHT			
OF ROOTS.	PERCENTAGE OF SOLID MATTER.		
14 to 20 oz. .	{ Max. 18.83	15.91	10.11
	{ Min. 17.46	14.52	9.12
32 to 40 oz. .	{ Max. 17.74	15.35	10.56
	{ Min. 15.55	13.65	9.20
48 to 60 oz. .	{ Max. 16.15	15.47	8.75
	{ Min. 14.80	13.89	7.87

The experiments which I have made upon this deeply interesting subject are not sufficiently numerous or varied to establish so important a law as that supposed to exist. The results so far are, however, very remarkable; and, whether they be the expression of a general law or an accident, they suggest a line of investigation, which, if properly followed up, would assuredly yield some valuable and interesting theoretical and practical results.* Such experiments occupy a great deal

* Since writing the above, I have found that M. Louis Vilmorin has proposed to improve the quality of the sugar-beet by selecting the densest roots, and growing seeds from them, and continuing this system of selection for several generations. I am glad that the results of my experiments are so fully in harmony with the experience of so eminent an agriculturist. He determines the density of the juice by cutting out, by means of a peculiar instrument, a piece of the root, which he rasps and presses. Small boxes, containing all the apparatus required for the purpose, are sold in Paris, and described by M. Vilmorin in a paper published in No. 5, for March 5, 1858, of that admirable periodical, the *Journal d'Agriculture Pratique*, edited by M. Barral.

of time, and demand great care and attention, and could only be successfully carried out by persons favourably circumstanced. To such I commend the subject; and, as an additional argument, I would suggest its immense practical importance; for if such a law as I have supposed exists, we might raise the quality of most, if not of all, cultivated crops far beyond their present condition.

In this respect there appears to be much room for improvement, as will be seen by a glance at the table containing the results of the determination of water and solid matter in bulbous roots. To increase the solid matter in all root crops (not including potatoes) by only one per cent., would be equivalent, in Ireland alone, to adding 50,000 acres to the area under cultivation!

In connection with this subject, it may be worth while to direct attention to the tendency which some nangel wurtzel roots have of starting, as it is called; that is, of prematurely producing their flower-stalk. This, of course, exhausts the bulb of its azotic and saccharine principles, at the same time that it becomes woody. I have determined, in several cases, the relative amount of water and solid matter in roots just about to produce their flower-stalk, and never found the amount of the latter to exceed ten per cent. Dense roots appear never to exhibit that tendency; but in a crop of mangel-wurtzel in which the percentage of water is high, a considerable number of roots prematurely produce their flower-stalk as soon as the amount of water passes 90 per cent., which it does when the root reaches about three pounds in weight.

If, by a judicious selection of seed, we could ultimately succeed in growing crops of roots having 15 or 16 per cent. of solid matter, it seems reasonable to suppose that we ought also to be able to develop some particular constituent which may be of more importance than the others. Thus some plants are grown for sugar, others for oil, others for fibre, &c.: it would certainly be a great advance in practical agriculture, if we could increase the relative proportion of each of these constituents in the respective plants which produce them. That such an initial difference of this kind may exist in plants, is, I think, proved by the different qualities of flax seed. Although the quantity and quality of fibre in the flax plant are very much influenced by the character of the soil, it is well known that all flax seeds will not produce the same quality of fibre when grown on the same land. Some will give a coarser fibre, others an extremely fine one. These differences in seed are of course the result of the influence of soil and climate upon the plants which bore them. There can be no doubt that, if experiments were made in this direction, most important results would be arrived at.

In assuming that a plant can transmit its *individual* as well as its *specific* character through its seed to the plants which they produce, I do not mean to imply that the action of this cause may not be modified or wholly counteracted by the operation of the numerous other causes acting during the growth of plants, especially by the modifying influence which the soil exerts in virtue of its mechanical and chemical constitution. The contrary must indeed be the case; for the individual character is, in the first instance, as I stated in reference to the flax plant, the result of the action of such causes. Whatever be the cause or causes which produce the specific character of a plant, they appear to be so powerful as to predominate over the action of soil, climate, &c. The individual character is the measure of the effect of those causes in modifying the specific type. If we consider with Rochleder that the homœomorphism of plants, like the isomorphism of minerals, is the result of chemical constitution,—and the opinion seems rational,—all modifications in chemical constitution, whether they consist in the production of an abnormal substance, or in the development of an abnormal quantity of one or more otherwise normal constituents, must, if they at all affect the seed, tend to perpetuate themselves—that is, to produce varieties. But nothing has yet been done, strictly speaking, to trace the kind of modification in chemical composition which most affects the germ.

In plants which produce but one flower-stalk, the whole of the germs are more likely to have the same chemical composition, and therefore the same structure, than where numerous flower-stalks are formed on different parts of the same plant. As each flower may be developed at different periods, the chemical constitution of the sap may vary very much within the intervals of time between the formation of the several germs, and consequently a different character may be impressed upon the germs of each flower. But even the seeds contained in the same capsule or pod often vary considerably in size and density. This is well seen in the leguminous seeds, but it may be often observed even in the case of such small seeds as those of the poppy. In timber trees, and generally in plants of slow growth, the constitution of the sap appears to be more constant and less liable especially to rapid modifications, or, at least, to those which affect the quality of the seed, than herbaceous plants. This is, perhaps, due in some measure to the various substances stored-up in the vessels and cells, the produce of former growth, which serve to dilute or counteract the modification. On this account, it is much to be regretted that no one has determined whether the sap of the

sugar-maple presents as great a variation in composition as the quick-growing sugar-cane and beet-root.

Plants being composed of chemical molecules subjected to the action of the force or forces which produce the phenomenon of life, a *species* may be considered as simply a series of groups of such molecules, whose motions fulfil, under a certain relation of forces, the condition of the most stable equilibrium. So long as the relation of forces deviates very little from that which results in equilibrium, the type is constant, and any deviations from it are transitory. If the deviation be considerable, we may have:—1. A modification of the type, which may be individual if the deviation be transitory, or may result in the production of a variety if constant; or 2. The deviation taking place slowly and by successive steps, so as not to remove, for a moment, the molecules from the influence of the vital forces, a new condition of equilibrium may arise, which would result in the development of a new species; or 3. The equilibrium may be so disturbed as to remove, for a moment, some of the molecules from without the sphere of vital force, the immediate result of which would be the death of the individual. If the transmutation of species be possible, the chances of the production of a new one may be set down at not less than one in several millions at least; while the conditions of equilibrium must impose a limit to the possible number of species which can exist under any given combination of physical conditions, and the most stable arrangements would naturally be those first attained. Now, from this point of view, the question of the extent to which a species might be permanently modified has not yet, so far as I am aware, been examined.

Although the action of chemical agents upon plants has engaged the attention of many distinguished experimenters, yet beyond the great outline sketched by Leibig, very few positive data have been, up to this, acquired. Perhaps the circumstance, that hitherto the influence of chemical agents has been only studied upon the individuals of a generation, may in part account for this.

Carefully conducted experiments should therefore be made, to determine the action of chemical substances upon plants through the several successive generations obtained from a single parent plant. The seed of each plant, beginning with that of the parent plant itself, should be carefully distributed into several sorts, according—1. To relative volume and density; 2. Shape, in reference to normal type; 3. Position of the flower on the plant, especially with reference to the action of solar rays; 4. Period at which the flower of each seed (if single) or of each pod, &c., was developed; and so on. In this way, whatever slight influences might be exerted on the different seeds of the parent plant, might be gradually exalted after two or three generations. Such experiments should not be confined to one or two families of plants, because, no doubt, every family would be affected more or less differently by the action of the same causes.

Table showing the influence of Size upon the relative amount of Water and Solid Matter in the usually cultivated Bulbous Roots.

Name of Root examined.	Weight of Root.		Per-centage of Solid Matter.		Difference between Large and Small Roots.		
	Large.	Small.	Large.	Small.	In Weight.	In percentage of Solid Matter.	
	lbs. oz.	lbs. oz.			lbs. oz.		
White Silesian, or Sugar-Beet.	12 7½	10 5	6.42	9.75	2 2½	3.33	
	9 4	2 7½	8.73	11.19	6 12½	2.46	
	5 10	2 7	13.40	15.34	3 3	1.94	
	5 2	0 13½	14.86	15.89	4 5½	1.03	
	4 9	1 1½	14.21	21.39	3 7½	7.18	
	4 0	1 7¼	10.40	17.43	2 8¾	7.03	
	4 0	0 12	12.94	15.32	3 4	2.38	
	3 13¾	1 4½	15.78	19.78	2 9¼	4.00	
	3 13½	1 10½	14.10	16.28	2 3	2.18	
	3 11¾	1 3½	7.95	18.76	2 8¼	10.81	
	Long Red Mangel-Wurzel	11 8	2 9	9.54	10.84	8 15	1.30
		9 13	3 13½	10.59	12.24	5 15½	1.65
9 5¾		2 1	9.41	14.09	7 4¾	4.68	
8 0		0 7	10.98	15.62	7 9	4.64	
7 4		1 0	10.79	15.91	6 4	5.12	
6 12½		1 5¼	12.28	14.68	5 7¼	2.40	
5 7¼		1 6	11.83	13.46	4 1¼	1.63	
5 6½		2 10½	14.93	14.72	2 12		
5 6		1 6	13.07	13.75	4 0	0.68	
4 8¾		1 2½	11.78	19.62	3 6¼	7.84	
4 6½		1 3	13.70	17.81	3 3½	4.11	
3 14		1 3	14.70	14.28	2 11		
3 14		0 14	14.62	16.03	3 0	1.41	
Red Globe Mangel-Wurzel		11 7	1 7½	10.36	10.53	9 15½	0.17
	9 3	1 15	7.05	9.20	7 4	2.15	
	7 3	1 4	12.35	13.50	5 15	1.15	
	7 2	1 1½	11.95	13.77	6 0½	1.82	
	6 12½	1 9	11.34	13.80	5 3½	2.46	
	6 12	2 4	12.82	14.64	4 8	1.82	
	5 10	1 12	12.66	15.41	3 14	2.74	
	5 6½	2 5	13.00	15.46	3 1½	2.37	
	4 3	1 14¾	11.58	15.50	2 4¼	3.92	
	3 15¼	1 2	11.64	14.34	2 13½	2.70	
	Orange Globe Mangel-Wurzel	12 1½	10 5½	5.24	6.66	1 12	1.42
11 9		4 5	9.96	9.35	7 4		
10 2		1 14	7.52	11.72	8 4	4.20	
9 10		2 5	11.88	12.58	7 5	0.70	
Orange Globe Mangel-Wurzel	7 14	1 5	11.11	13.77	6 9	2.66	
	7 0	1 3½	11.66	16.12	5 12½	4.46	
	6 11	1 1½	10.80	18.34	5 9½	7.54	
	4 10	1 1	9.99	16.60	3 9	6.61	
	4 9	0 11	11.94	13.36	3 14	1.42	
	4 2	0 11	10.68	15.19	3 7	4.51	
	2 15	1 3½	14.32	14.10	1 11½		
Yellow Globe Mangel-Wurzel	7 3	1 4	12.35	13.50	5 15	1.15	
	5 11	1 12	12.66	15.40	3 15	2.74	
	4 3	1 14	11.58	15.40	2 5	3.82	
Purple-Top Turnips (Bullock) Aberdeen }	5 11½	3 3½	8.08	8.93	2 8	0.85	

Name of Root examined.	Weight of Root.		Per-centage of Solid Matter.		Difference between Large and Small Roots.	
	Large.	Small.	Large.	Small.	In Weight.	In percentage of Solid Matter.
	lbs. oz.	lbs. oz.			lbs. oz.	
Skirving's improved Purple-top Turnips	8 8	1 9½	10.69	11.07	6 14½	0.38
	7 13	1 9½	9.77	12.75	6 3½	2.98
	6 0¾	1 11½	10.61	12.23	4 5¼	1.62
	6 0	1 9	11.32	12.71	4 7	1.39
	5 10	1 9½	10.37	11.42	4 0½	1.05
Laing's Purple-top Swedish Turnips	9 10	1 8	9.95	11.21	8 2	1.26
	5 0¾	1 1	12.00	11.76	3 15¾	0.00
Matson's Purple-top	5 9½	1 10	11.09	14.41	3 15½	3.32
East Lothian Purple-top	6 0	1 9	11.17	11.73	4 7	0.56
Ashcroft's Swedish Turnips	6 12½	2 6½	10.82	10.52	4 6	0.00
Fettercairne Green-top Swedish Turnips	7 10	1 3	14.40	11.30	6 7	0.00
Green-top Swedish Turnips	6 6	1 7	10.71	11.68	4 15	0.97
	4 8	1 6½	11.69	11.74	3 1½	0.05
	3 8	1 0½	11.65	12.36	2 7½	0.71
	3 5¾	1 0½	12.80	11.78	2 5¾	0.00
Swedish Turnips (variety not determined)	12 4½	2 0½	9.30	11.70	10 4	2.40
	11 11	1 1	10.10	11.98	10 10	1.88
	10 8	1 5½	10.35	12.03	9 2½	1.68
	9 13	1 14	9.91	12.19	7 15	2.28
	8 8	2 13	10.94	11.47	5 11	0.53
	8 2	3 11	11.20	12.93	4 7	1.73
	8 2	1 15	10.63	12.14	6 3	1.51
	7 15	1 9	10.93	12.13	6 6	1.20
	7 8½	0 14	10.08	12.34	6 10½	2.26
	7 1	1 5	18.06	12.79	5 12	0.73
	7 0	0 14	11.08	12.62	6 2	1.54
	6 12	1 5¼	12.66	20.01	5 7¾	7.35
	6 7½	1 3½	13.73	16.25	5 4	2.52
	6 1	1 2	11.18	12.30	4 15	1.12
5 11	1 10	11.68	12.77	4 1	1.09	
Orange Jelly Turnips	5 0½	0 14½	5.67	7.09	4 2	1.42
Parsnips	1 11	0 6¼	12.03	13.42	1 4¾	1.39
Red Carrots	1 9½	0 3	12.13	17.81	1 6½	5.68
	1 8¾	0 2¼	11.08	19.72	1 0½	8.64
	1 6	0 9½	12.02	11.51	0 12½	0.00
Red Surrey Carrots	2 10¼	0 12	11.92	13.70	1 14¼	1.78
White Belgian Carrots	3 4	1 0	11.69	13.50	2 4	1.81
	2 6½	0 9¾	13.17	14.36	1 12¾	1.19
	2 0	0 11	12.06	14.04	1 5	1.98
	1 15¾	0 9	11.10	13.09	1 6¾	1.99
	1 1½	0 3½	12.72	14.09	0 14	1.37
	1 1	0 5	12.65	13.07	0 12	0.42

GENERAL MANAGEMENT OF PLANTATIONS.

A plantation is an assemblage of trees growing on the surface of the earth, on which the young plants have been inserted for the purpose of being reared into timber, an article of vast importance in the domestic economy of the human race. A tree is one of the first creations of nature, and one of the most abundant productions that are found on the face of the earth. The surface is adorned by the presence of trees in the lofty stem and canopy of foliage. Cold situations are sheltered and rendered warm by the protection afforded from congregations of trees; and the trunks are manufactured for a large variety of purposes in every clime of the known world. Without trees the face of the earth would lose a large part of its beauty.

In the modern economy of using the earth for the purposes of cultivation, trees are reared with three intentions—for scenery, for shelter, and for growing timber as an article of commercial value. The first use prevails chiefly in lowland situations, and upon rich soils; the second is used on high ground, in order to afford a shelter to declining situations; while the third occupies all the upland and highest positions in which vegetation is able to live and grow. The first application is beyond our present purpose: the second and third occupy all high grounds, from the most Alpine heights down to the low situations of scenery and pleasure; within this range are comprehended hills and moors never cultivated, and banks and declivities beyond the reach of the plough.

The rearing of timber is an object of much importance to the owners of the soil, and of a very considerable interest to the national community. A general rule directs that all the grounds be planted with trees which are inaccessible to the plough by reason of elevation, declivity, or any other insuperable objection of nature. And when a grassy surface on a kindly subsoil yields a grateful herbage to animals, the position of plantations must be so arranged as to afford shelter to the grounds that produce the value in pasturage. The profits of the grazing will determine if the use continues for animals, or may be better converted into plantations. Very high elevations deny the growth of any vegetation. Grasses grow where trees cannot live, and consequently such a value must come from these situations as nature is pleased to allow. Plantations are best made on moderate elevations, or sloping grounds that forbid cultivation, and on low situations where for special reasons a congregation of trees may be eligible.

Trees of use are naturally divided into two large assortments of hard and soft timber, which are assorted by the relative situations of growth and utility. Young plants are raised in nursery-grounds from the ripened seeds to the age of two and three years, and then planted in the open grounds. Fir trees form a large division of the soft timber, and the hard kinds of Britain are the

oak, ash, and elm. Other sorts of trees are introduced in the low grounds where scenery is the object.

Grounds intended to be planted with trees must be completely fenced during the year previous to the planting, which may be done in the way that is the most convenient to the circumstances of the locality. Stone walls are the most ready and effectual fence, and when sunk into the ground the effect is useful and agreeable. A strong turf wall of good materials constitutes a good fence, and is often of more ready access than stones. Timber palings will last for many years, and where timber is plentiful will be often used. Different modes will prevail, as the locality affords the materials. Wet grounds must be thoroughly laid dry by surface draining, of which the ditches are placed in the lowest grounds, and follow the sinuosities of the surface in every direction, however crooked or awkward the appearance may become. The general discharge must lead to a large ditch, brook, or rivulet, into which the water escapes. The conveyance must be clear and uninterrupted to the outside of the plantation, if at all possible to be got. If a flat surface occurs, an artificial level must be sought and made for the special use.

Two methods are adopted in planting trees; one way opens circular pits in the ground, three to four feet apart, about one foot deep, and one foot-and-a-half in diameter. The tree is placed upright in the centre of the hole, with the rootlets carefully spread abroad by the hand, the excavated earth is thrown into the pit, and trodden firmly round the tree by the foot, and then the grassy turf is placed as before over the pit, and cut into two parts, with the tree in the incision. The earth being trodden firmly by the foot, and the turf being compressed with the back of the spade, finishes the planting of the tree. This mode is adopted for plants of the largest size, which are placed at widest distances on the ground. The second method of planting trees makes two incisions with the common spade, centrally crossing each other at right angles; the tree is placed in the ground at the point of intersection, the spade holding up the turf till the plant is fixed, and then depressing it to receive the position. The roots of the plant are neatly dressed by knife, and the feathers are arranged in the new position before the fixture is accomplished. This method is cheap and expeditious, and leaves the roots among the best soil on the surface of the ground on which to spread horizontally, and establish its abode; whereas in pits, by the first way of planting, the roots are placed in the subsoil, which is often pernicious and inimical to vegetation, the growth is stopped till new roots emerge from the stem, and draw substance from the upper soil. Trees are fibrous-rooted plants, and spread horizontally along the surface of the earth: no tap-root descends to require a depth of humified earths, and consequently

the insertion may be more shallow, and the labour less costly. The last-mentioned method is therefore the preferable way of planting young trees in the ground.

The distance between the plants and the number of trees that are required to cover an acre of ground are very much varied both in opinion and practice. Hard timber trees—as oak, ash, and elm—are usually planted in four feet apart, on the calculation that one-half of the trees are taken out when risen to one-third of the full growth, in order to make room for the standing crop, and that those remaining trees need the space of eight feet between them. But experience has shown that a full crop of timber trees can stand at four feet apart, and consequently the first planting must be thicker on the ground. The larch and Scotch fir are found the most suitable plants on the highest exposures, and even on the sheltered slopes of these elevations these trees maintain the greatest worth on the lowest declivities, and upon the best grounds the oak, ash, and elm claim the preference; and on low flooded lands, which cannot be amended, the willow and the alder are the chosen plants. The beech on chalks, the hazel on rocky banks, and the birch on barren gravels are the useful introductions; and in some situations the Spanish chestnut will equal in value the most esteemed trees in Britain. In every case of planting trees on high or low grounds, and of firs or hard timber, the distance between the plants will be two feet, and the number on an acre will vary from eight to ten thousand. The plants of hard timber may stand at two-and-a-half feet apart, and in certain exposures the fir trees may be so close as eighteen inches. These close distances are required to create a mutual warmth, and to promote the upright shooting of the plants by preventing the lateral expansion.

The planting of trees is best done in the months of November, December, and January; and during the mild fresh weather that occurs during this wintry division of the year. So soon as the setting of the plants is accomplished the gates are shut, and, as the fencing has been previously done, the performance is wholly completed. Roads of twenty feet in width are left in the convenient directions over the planted grounds, and so arranged as to afford a ready and convenient access to the working requirements, and to the vehicles of export when the felled timber is removed. This convenience is never to be omitted, being made in all cases of plantations of trees. Open ditches are dug along the sides of the roads in all places where water may overflow the passages, and are directed to discharge the contents into a main outlet. On all wet grounds these ditches are necessary.

The close planting of trees allows the growth to be altogether unmolested, save the insertion, during two years, of fresh sets in the places where a failure of growth is seen to happen. The most vigorous and thriving trees take the lead, and carry the pre-eminence, and strive to reach the benefit of sunshine, which is necessary to a prosperous vegetation. A certain number of plants attain that station, and form an unobscured

canopy of leaves and branches that join in the contact. Beneath this covering all vegetation is killed, and almost every life extinguished, at least, that rises upwards in any considerable height. The trees that cannot rise upwards into the sunshine are killed; and when seen to be fairly mastered, are usefully removed for fencing purposes. The lateral branches of the trees that succeed in obtaining the permanent elevation die away, from a beginning at the bottom of the stem, and are killed progressively upwards, according as the tree rises in height. The decay follows closely on the ascent of the stem, and there is left on the top of the tree "only" a round canopy of green branches and leaves, of a small vertical extent, and so far laterally as the contiguous formations will allow. The stem of the tree becomes a straight boll, without any knots or blemishes. The upward struggle of growth prevents any bendings or lateral inclinations, and the efforts of nature are directed to one chief point. By this method nature exhibits the finest timbers in the world. In the wilds of America, in the straths of Scotland, and on the rocky mountains of Norway, the seeds are sown by the wind, and the roots are struck into the uppermost stratum of decayed vegetable earth—a lesson which forbids the pruning or lopping of branches, and the insertion of young plants deeply into the ground.

The pruning of trees, or the cutting away of the branches by a saw or chisel, is a mangling process, which very much damages the timber of the stem. Sap flows to an incision, and very often protrudes a number of young shoots, or a struggle is made to cover the wound, which forms a large blemish when the timber is sawn for use. When the tree prunes itself by means of a killing confinement of the lower parts, as by close planting, no such accident happens; the decay is gradual and progressive, and the sap flowing upwards by the attraction of heat, leaves the branches to a complete annihilation; there is no wound to be covered with bark, the branch drops off, and the junction with the stem is soon imperceptible; the expense of pruning is avoided, and also the labour and cost of thinning, which is seldom repaid by the value of the clearances. The trees grow to a full maturity, and have no attention, except in keeping the fences good against trespass, and in removing the stems that are undergrown, before rotteness destroys the use for fencing.

About one-fourth of the number of trees planted will remain for crop, and will average about two thousand on an acre, standing at four or six feet apart. The other portion of the original plants is sacrificed to the purpose of raising the standing crop into a prosperous condition. The first thinnings are useful for fuel only, being the young trees that are first killed by the stronger plants, and consequently are very small in bulk. The second thinnings will be of older plants that have grown for several years, and then mastered—the use will be for light fencing; while the third and last thinning will consist in small trees of many years' growth that are overtopped at the summit of the canopy of extreme growth; the stems are sawn and made into gates and fencing purposes. The crop of timber trees proceed to

the full growth, then felled, and the ground replanted as has been directed.

The observant eye that looks into a congregation of trees which have grown under Nature's care, or that have escaped the havoc of the thinning and pruning performances, cannot fail to discover the truth of the above statements, and that the system is supported by the most rigid adherence to established law. In these places are seen the stems of trees, tall and straight, without branch, knot, or excrescence of any kind, and the bark smooth and slippery, without any interruptions. Wherever the sun and light are allowed to penetrate, the branches of trees will seek it laterally as well as vertically; and the number of shoots will be proportioned to the free access which is given to these necessary elements of growth. The vegetation is thus directed to many points; the tree becomes a bush, and fails to reach the height of a timber provision: the stem is knotty and rifted, and inferior in the hands of the workman; and the wider standing of the trees reduces the number on an acre of ground. Close planting directs the efforts of vegetation to the vertical growth, which forms the tree without any lopping of branches, or cutting and thinning.

The seeds of trees may be sown by hand on the surface of the ground intended to be planted, and a very large quantity of the seeds on an acre. The seeds germinate and strike roots into the soil, and better timber is produced than from nursery plants. It will be advantageous that the grass on the surface be not consumed by any animals for some years previous to the seeds being sown, but allowed to fall and decay yearly, which will afford a bed of vegetable earth for the germination of the

seeds and attaching of the roots in the ground. The young plants will grow in a close condition, as from the inserted stems; the thriving individuals will rise and form the crop, and the inferior growth will dwindle into underwood, and be altogether extirpated. The quantity of seeds must be very ample; and when a failure is observed in the first and second years, another sowing must be done in a smaller quantity, and every means used to obtain a full crop on the ground. All vermin that eat tender shoots and gnaw the barks of trees must not be present, and the fencing of the sown grounds must be very secure. The collection of the seeds for use will supersede the nursery, and a very considerable expense will be saved. Nature has shown the way, and the results are superior to the mode that is now followed, which employs much more time and expends a large cost. The stem of the nursery being cut close by the ground, sends forth a vigorous shoot, which grows far more luxuriantly than the old stem, and this shows the superiority of every growth from the position where the vegetation is to be permanent, and the seed is more vivacious than any stem.

No advantage attends the mixing of different kinds of trees in a plantation, as of firs with hard timbers in various proportions to each other. The contrary is evinced by there being seen a generic affection amongst vegetables, which thrive best when associated with their own congeners. Oak and elm trees on the lowest grounds, the ash and beech on the first sloping declivities, and the larch and Scotch fir to occupy the higher positions along with the most alpine situations that occur. This assortment will adapt to all situations in Britain.

SCARCITY OF FORAGE IN FRANCE.

TRANSLATED FROM THE FRENCH.

"The *Moniteur* of the 17th September, tranquillizes the public mind as to the consequences of the scarcity of forage: it says rightly that the crop of oats is not quite so bad as we feared, and that we shall find some resource in the autumnal produce." In support of that opinion the official journal publishes a statement of the contract prices of the Minister of War, in the different military divisions of hay, straw, and oats, and he congratulates himself at the price not being so high as we might perhaps have expected.

The article of the *Moniteur* is thus worded:

"The drought which has been so severe since last winter, had considerably injured the crops of forage, and there was reason to fear a real scarcity of the articles requisite for the maintenance of horses and cattle.

"Beneficial rains have fortunately come to calm their apprehensions. They have refreshed the vegetation of the meadows, and improved the autumnal cultures that are to succeed the forage. In short, the crop of oats has been more productive than was at first feared. The price of this grain has decidedly fallen in all our markets."

"Commerce with its accustomed activity also assists in

establishing an equilibrium in the price of hay, by taking from those countries which have been the most favoured, a supply to be transported to those districts in which the deficiency has been the most seriously felt.

"In consequence of these circumstances the War Department has obtained results in its contracts relatively favourable, especially if we consider that the agreements limited exceptionally to six months, embrace the periods of high prices, which will be found to cease at the approach of the harvest of 1859. These results are placed in the following table."

Let us now look at the contents of the official table of the contract prices. We have calculated the mean price for each military division, and also the mean general price. The lowest prices are 8 francs (6s. 8d.) at Auch and Tarbes for hay; 4 francs for straw in the *Cotes de Nord*, l'Allier and le Puy de Dome; 18 francs for oats in le Morbihan. The highest prices are 17 francs (14s. 2d.) at Cauebrac and Douai for hay; 9 francs 15 cents. (7s. 7½d.) at Fontainebleau for straw; and 27 francs 10 cents. (22s. 7d.) for oats in the 12th military division. The sales are all by weight and by 100 kilogrammes (2 cwt.) In the prices inserted in the tables are comprised the

expense of management of allotting the rations, of distribution, and all the expenses generally included in the charges of the agents:

Departments.	Hay.		Straw.		Oats.	
	Fr.	Ct.	Fr.	Ct.	Fr.	Ct.
1st Military Division—Eure-et-Loire, Oise, Seine-et-Marne, Seine-et-Oise, Yonne.	12	94	7	07	23	03
2nd Military Division—Eure, Orne	13	00	7	90	23	35
3rd Military Division—Nord, Pas-de-Calais, Somme	14	76	6	25	22	76
4th Military Division—Marne, Aisne-Ardennes	12	71	7	25	22	74
5th Military Division—Moselle, Meurthe, Meuse-Vosges	12	26	6	22	24	12
6th Military Division—Bas Rhin, Haut Rhin	13	83	5	60	22	13
7th Military Division—Daubs, Cote d'Or	11	50	4	72	22	50
8th Military Division—Aine, Drome, Isere, Loire, Saone-et-Loire	10	58	6	38	22	04
9th Military Division—Bouches-du-Rhone, Vaucluse	11	56	4	93	21	61
10th Military Division—Herauld, Gard.	12	34	7	25	23	75
11th Military Division—Aude.	9	00	6	00	22	50
12th Military Division—Tarn, Tarn-et-Garonne Lot.	8	00	5	95	27	20
13th Military Division—Hauts Pyre'nes, Gers	8	00	6	18	22	62
14th Military Division—Gironde, Lot-et-Garonne.	16	25	5	45	21	35
15th Military Division—Maine-et-Loire, Deux Sevres, Vendee	10	60	4	66	21	00
16th Military Division—Cotes-du-Nord, Manche, Morbihan.	10	00	4	33	19	50
18th Military Division—Sarthe, Vienne	12	10	7	22	22	50
19th Military Division—Indre, Allin, Nièvre	9	83	4	23	21	13
20th Military Division—Pays-de-dome, Cantal.	11	75	5	25	25	70
21st Military Division—Creuse.	10	65	5	00	22	00
Mean general price.	11	27	5	90	22	56

What consequences may we deduce from these figures, and the statement published in the *Moniteur*? Legitimate desire to prevent the prices from reaching a maximum, and the proof also of the insufficiency of the high roads now existing, completed as they already are, to prevent the value of the same commodities at different points of the empire from varying from par to the double.

THE SLIDING SCALE.

The agriculturists are at this moment greatly disturbed; they want to know the position in which they will be placed by the laws for the importation and exportation of cereals. We have flagrant witness of the feeling, which we seek to express with moderation, in the agricultural votes of some of the general councils, and in speeches recently delivered. We must be excused quotations in such a matter. We are always afraid of deceiving ourselves when we view things rather by the heart than by the understanding. Where we can calculate with mathematical or chemical precision, we do not hesitate; but when it relates to matters which the scales or the formula cannot ascertain, we confess that we experience hesitation, and seek advice of volunteers more experienced. What, then, do the agriculturists tell us through the organ of those who enjoy their confidence? See, in the first place, a letter addressed to us from the

centre of France, and which refers to a discourse delivered at the general council of La Nièvre, by M. le Baron Charles Dupin.

"Mr. Editor,—I am surprised, on reading the commercial review of the 5th September of the *Journal of Practical Agriculture*, to see M. Borie exhibit himself as a partizan of the admission into France of foreign wheat, and advocating the suppression of the sliding scale. Is such a wish favourable to the interests of agriculture?"

"I am not the declared enemy of a *free exchange*, but, to be just, it must be entire, absolute, unlimited; that all manufactures and products should be free, tissues, iron, sugars, coffees, &c. Everybody would then get out of it as he might; *the State first*, but everybody would then be upon an equal footing.

"Is it just, in fact, to admit the free entry of foreign wheat, and not allow the agriculturist to purchase his iron, tissues, clothing, from countries where they are cheaper and of better quality? Is it just to raise against him a competition whilst taking from him the means of combating with it?"

"We want, therefore, equal protection for all industries, or absolute freedom for all; beyond this dilemma it is oppression, and not justice.

"'But,' say they, 'bread must be cheap.' Well, then tissues and cottons must also be cheap; for it is as indispensable to be clothed as to be fed. Grant, then, the same favour to these two articles of first necessity.

"But is it so much the interest of the working class to have wheat at a low price? The city workman would perhaps congratulate himself upon it; but the rural peasant would regret it. It would always be better for him to pay a reasonable price for his bread, according to the wages he earns, than to purchase it sometimes very dear, and other times at an excessively low price. In the first case his wages become insufficient; in the second, he does not always find work; for, proprietors and farmers being cramped, reduce considerably their operations.

"You were quite right, Mr. Editor, in saying, at the meeting at Dijon, 'The reduction of the price of cereals impoverishes and ruins the agriculturist, and produces enormous sufferings, of which we have been, and are, alas! the witnesses. It leads by degrees to a less production, a neglect of culture, scanty harvests, and scarcity.'

"If we wish to see a return of the excessive prices of the years 1854, 1855, and 1856, we have only to arrange so that the agriculturist continues to lose by his produce whilst having abundant harvests.

"If we consult the manure merchants, they will tell us that for a year past their sale has diminished more than one-third. Add to that the enormous diminution in the number of cattle required for that year, for want of the ability to feed them, and see where all this leads us—to a famine before two years if such a state of things continues.

The government ought, therefore, to endeavour to secure to the cultivator a remunerating price for his products. Its interest as well as its solicitude for two-thirds of the population of France ought to enforce this.

"The emigration from the country to the towns has already been disastrous enough, let us not promote it more by rendering the position of the rural population more unfortunate.

"I conclude by quoting the remarkable words that M. le Baron Charles Dupin has just spoken at the General Council of la Nièvre on the subject of the sliding scale. 'With respect to our cereals, we must not abolish without law—the law which protects them, and which for twenty-six years has defended agriculture: we should not dare to act thus to reduce again

the price of wheat, when it is below the net cost of production, and *when distress is already at the door of the farmers.*

"If we were to commit an act so fatal, our agriculturists must do as did the Irish, and either emigrate or die. Such was the course taken by the agriculturists of an isle, admirable nevertheless for its fertility—'the green Erin.' In ten years, one peasant in four had left his abode. That is equal to nine millions of French to be exterminated from the soil of the country. Will they do it? These are no romance but facts.

"I am, Mr. Editor,

"E. DE MONPOLY.

"Pontlevay (Loire-et-Cher), Sept. 12."

Agriculture claims not, and never has claimed any privilege.

Equality with other production for us is the only wish it has ever unanimously expressed. This is just what M. Borri has said and what M. Moupoly asks. It would refuse a protection that would injure manufacture or commerce, or the development of the maritime or colonial power of France. Of this M. Charles Dupin may be assured. Our agriculture can produce at the same price as other and foreign nations, and it is this which gives it a superiority over manufacture: they have availed themselves of this fact in order to overload it with fetters to the benefit of other interests. The government, we firmly believe, now wishes that it resumes its place, that it may not be sacrificed in its efforts to fulfil its mission.

EXPERIMENTS WITH POTATOES.

Does the Potato Degenerate?—In answer to this question, allow me state some facts which have come under my own observation this season. Of some two dozen varieties planted, not more than one-third of them have produced a *single ball*. Six of these, occupying less than three-fourths of an acre of ground, we do not believe produced more than one quart of balls all told. The Early Blues produced some half-a-pint to a pint of balls to a square rod or so. But some Prince Alberts produced some four quarts to the square rod by actual measure. This would be at the rate of 20 bushels of balls to the acre. I do not think either this town or county has produced from all other varieties put together 20 bushels of balls this season.

Seven stalks of the Albert produced 135 balls, and 60 tubers. One hill of three stalks produced 54 balls and 20 tubers, and one stalk to one hill produced 42 balls and 5 good table potatoes. This last-named stalk is an isolated case, and gives a product of over 8 balls to each tuber. The *Albert is without a rival* in producing either balls or tubers. The Albert is tough, hardy, and vigorous, and will endure the blight like the king of vines. His stalks are still green, which, with my Jenny Linds, which are also green, still stand unharmed comparatively with the potato blight, which was never known to be *worse* in its features, or more extended in its ravages than *now* among our common varieties.

Experiments with Salt.—About the first of June last I took up a refuse potato, and began to cut it open; it was black within, and not fit to give to a hog. The chits in part being alive, I resolved to plant it (or the eye chits), and after digging down to the subsoil, I put down at least two large handfuls of salt, and returned the earth again; then about even with the surface I scattered in the eye chits. After many days four of the chits came up, of a deep green hue, and grew vigorously. Not until just before the last hoeing did I add any further stimulant, when I put on two handfuls of compost of hen manure, ashes, and rich earth. These tops continued to grow vigorously until September; but no balls, no blows, and no buds, nor the least sign of a bud ever made their appearance on these tops. I pulled these tops green Sept. 11th., and dug out nine tubers, all sound and perfect up to this date; I intend to plant the same in 1859; and if they continue sound and produce balls, I intend to report the same for the benefit of the reading public. I believe in a warm dry soil, salt as a manure, and deep clean culture, in raising a crop of sound potatoes, and *last, but not least*, in harvesting potatoes like other

crops, as they ripen—at least their tops, which amounts to the same thing. This is like electricity and steam on this point. "Knowledge is power."

I have as yet dug but five rods of Alberts, one rod of which yields 44 quarts, or at the rate of 220 bushels to the acre. This rod was salted in the hill, eight inches below the chits, three chits in the hill, twenty-five hills to the square rod, manured with a fork of hog manure upon the salt, and the whole covered with five or six inches of mellow soil, and then, in dents made with the hoe inverted, the chits were dropped near the natural surface of the soil, the hills gradually raised by three hoeings, before the last of which a large handful of home-made guano was thrown in among the stalks, composed of four parts hen manure, one part ashes, and eight parts rich earth, mixed together, dry and fine. One rod was planted in rows, and done as the other four, salt excepted, and the product in tubers was 40 quarts, or at the rate of 200 bushels to the acre. The salted potatoes ripened four or five days first, without losing their freshness any sooner than the unsalted ones, in respect either to their stocks or leaves.

The Kansas potato is unsurpassed for the table by any coloured variety, and yields nearly as well as the Albert with the same treatment. Have dug two or three bushels of these, the largest of which weighs 14 ounces. The largest Albert yet dug weighs 9 ounces, but they have very few small in size. The other objection to the Kansas potato is that it ripens in the critical period; if this can be obviated so as to make it a later variety, it will be considered second only to the Albert in excellence for the table for some time to come.

My *main* object in planting so many varieties of the potato every season, is to find some way to *invigorate*, and then to *redeem* the whole. I do confidently expect to show, by the end of twelve months, a true method of working out full "redemption" for the potato crop.

The solution of this problem is connected with the establishment of the equilibrium in the development of the stalk and root of the potato. On this critical point man's ingenuity will be taxed to the utmost stretch for some time to come, as it has been in time past.

To *discard* the use of manure in growing a crop of potatoes is not likely to accomplish the *greatest discovery* of this or any former age of the world.

J. C. CLEVELAND.

Torrington, Ct., Sept. 16.—
Country Gentleman.

THE BIRMINGHAM AND MIDLAND COUNTIES FAT CATTLE AND POULTRY SHOW.

The success of a fat cattle show is scarcely susceptible of a purely agricultural test. Such exhibitions have ever been popular with the general public, who regard them as an agreeable prologue to "the festivities of the season." Town people feel by no means so much at sea here, as when opposed to all the progressive arcana of the art. On the contrary, they stand up for their rights and privileges as the consumer, assume knowing airs, and handle beasts and stir up pigs in the most business-like manner. They have, in fact, a thorough consciousness of the important part they will play in the proceedings, and estimate the different specimens of perfection arranged before them in much the same spirit the connoisseur did the water-fowl in one of Herring's farm-yard scenes:—"Beautiful, certainly! How I should like to have them—stuffed with sage and onions!" And so Paterfamilias mentally cuts up Mr. Stratton's Shorthorn into Christmas beef, or carves a delicate slice from the chine of one of my Lady Chesterfield's pigs; while mamma thinks of her dear boys coming home from school, and the famous suet that will mingle in pies and puddings, or bargains for the prize turkey, to be served with a City Sheriff's chain of office hung about him.

This general interest in the occasion is especially observable at the Birmingham meetings. It is not every one, after all, who can properly appreciate a fat bullock, or a much-enduring pig. But here we have the most agreeable variety. Indeed we question very much whether wives and daughters do not enjoy the show even more than the good man himself. The attraction, moreover, extends to all classes. The select day, for instance, is quite an assemblage of rank and fashion, and one honest citizen openly admitted that he paid his five shillings more for a sight of "the company" than anything else. And rank and fashion, be it understood, have strictly a right here. The Countess of Dartmouth, the Lady Evelyn Stanhope, and the Lady Sophia Desvœux are the keenest of rivals for Dorking chickens. The Honourable Mr. Vernon plumes himself on his black-breasted game cocks. The gallant Colonel Clowes has a first prize for Polands, while the Premier of England is only mildly commended. And then, clergymen, heads of firms, heads of families—that is, ladies of course—tenant farmers, country squires, little boys, and boarding-school Misses have each a pen for sale, or a prize to take. The general attendance, however, of the whole week was not what it has been.

"The Midland Counties," however, is equally and as deservedly well-known for the excellent entries of stock it has now for some years collected together. And certainly there was no great evidence of falling markets in the show of this past week. Without going back to the figures themselves, we believe the numerical strength

and support of the meeting by breeders and feeders was quite up to what it has been. At the same time the character of the exhibition was, in many leading features, by no means so good as heretofore. With a few prime beasts to select from them, it was one of the roughest, most moderate, and unequal lot of Herefords we ever remember. Then the Shorthorns, as a class, were not remarkable for their quality; while the Devons, good as they were, counted up to even less than usual, and were far too few to create anything like interesting competition. Taking the whole range of these three established breeds, a really good beast had every opportunity for distinguishing himself, as one most unquestionably did. This was Mr. Naylor's first prize Hereford ox, the best steer at this meeting last year, and that we then spoke of as promising to still further improve. He has now grown and fed into one of the *neatest* Herefords ever seen. His symmetry is so perfect, that, as is the case with all well-formed animals, he looks much smaller than he really is. Neither is he so "upstanding" as the sort often are, but more compact and close in his frame. With this he unites all the best points of his race—has a sweet head, is beautifully marked, and is as fine a handler as a butcher ever touched. Of course he carried off a whole accumulation of premiums. He had one as the best of his class, another as the best Hereford, a third as the best of all the oxen, a fourth as the best bred and fed by the same man, and a fifth as an especial compliment to his breeder. There wanted but the culminating honour as the best of all the animals, male or female; but with all their ingenuity in this way, the council have not yet arrived at that insignia. Mr. Naylor's ox cannot go on to Baker-street, having been exhibited there as steer last Christmas, when he was hardly done justice to, reaching no higher than a third prize. Curiously enough, the second prize Hereford was also second at Birmingham in the steer class last year, being then as the property of Mr. Child. He has also improved, but his proportions are by no means so perfect as those of the Gold Medal ox. Mr. Shaw, the gentleman who took this in 1857, has sent another good beast, and Lord Aylesford and his Royal Highness the Prince Consort contribute to the merit of the class. With these, however, are associated some very inferior animals, so much so as to prove that a lesson, although ever so often repeated, may be still thrown away upon some people. The Hereford steers were a good, but not a grand class; the cows neither in numbers nor excellence up to an average, but the heifers as a whole by far the best of the breed. Over the first and second prizes (standing side by side) it was difficult to make a decision: Mr. Steadman's had the best of it for size, and Mr. Price's for beauty and quality. There were but six shown here, while the judges highly

commended a third, and added one general word of approval for the entire class.

Of the famous Shorthorns there was quite as clearly a falling off. There were not so many of them, and these were not so good. Tested by the great points quality, symmetry, and pedigree, the best of the entry was Mr. Henry Smith's cow, which took the prize in the Extra Class, and the Otley Medal as the best cow bred and fed by an exhibitor. By Mr. Booth's famous bull Harbinger, a beautiful handler, and a model to look at, there could be only one reason for finding her in such a place. Although now nearly six years old, she has never had a calf, and hence her reduced value as only butcher's meat. Mr. Swinerton's Gold Medal Cow is also an extraordinary one, the very realization of a fat cow. Her breadth of back is marvellous, her head a very picture of bovine beauty; while she is most evenly fed, has rare thighs, and scarcely any deficiency to counteract so good a top. Still the fastidious questioned her being very highly bred, and pointed to certain dark hairs in her coat as being anything but orthodox. Another very good one was Mr. Browne's Prize Heifer, which some of the cognoscenti selected for a union of shape and touch, as the medal cow, and as a breeding animal she would most probably have had the best of it. She was well supported by one of Mr. Hunt's and another of Mr. Herbert's entries; but, taken altogether, the Shorthorns showed in no great force. There were only four heifers entered, and just as many steers. Mr. Stratton led the latter with a red-and-white beast that has some of the Booth blood in him. He will most likely be kept for another year, but is to come on to the Smithfield Club. Mr. Root's First-prize Shorthorn Ox is a big, broad, useful beast, but not closely packed enough, nor sufficiently low on the leg to rank as a very fine sample of the sort. Lord Spencer sends a fair second, but there have been many years when neither of these would have attained the honours now awarded them. By the evidence of this meeting, either good Shorthorns are too good to feed, or they want hunting-up a little.

Mr. Turner, of Barton, had his usual pre-eminence amongst the Devons. He himself sent the best ox, and had sold to the Prince Consort the best steer, and the pick of all the sort. They are both admirable illustrations of a most beautiful breed. The heads appear to be getting even finer and prettier than ever, while their extraordinary width of chest, rare backs, evenly-covered bodies, and fineness of bone and quality, all tend to assure us how well they will cut up. There is scarcely any beast with so much prime beef about him. Only ten in number, all the Devon Oxen were good; and of the females there were only two sent—one cow and one heifer. The judges considered both worthy of a prize, but the heifer, especially, was by no means a first-class animal.

There were five Long-horns sent to compete for three prizes, and nearly all these so inferior as to well warrant the Society in discontinuing the class. Surely Messrs. Chapman and Satchwell must see by this how

much they are out of date. We can only go back to bring such stock again into repute.

The Scotch breeds brought half-a-dozen very good Highlanders, of which Mr. Corbet, of Sundorne, a new exhibitor, claimed the best. The two prize beasts, a black and a grey, comprised the whole of the Welsh entry.

Certainly on this occasion one of the most improving, and always one of the most interesting features, is the show of cross-bred stock. In the oxen, there were three very successful experiments—one tried by the Duke of Beaufort between a Shorthorn and a common Gloucester cow; another, by Mr. Farquharson, of a Devon and Highlander; and the third, that useful north-country cross of the Shorthorn bull with the polled Aberdeen cow. The Hereford and Shorthorn, although more frequently tried together, do not give such good results as either of the three we have named. The Duke, who is apparently fond of seeing how the different strains will "hit," may now boast of the best ever exhibited. So good was his beast thought by the judges, that it was the only one they dwelt over previous to awarding the gold medal. Had "the cross" taken it, the sensation would have been very great. The Devon and Highland union was also very happy; while that employed by Mr. Stewart has long been appreciated by those who have the opportunity of using it. A first cross, many say, is almost always a good one; and, if so, why do we not see more of it? That is, of course, for butcher's meat, and not with the vain hope of perpetuating the strain.

The meeting also excelled in cross-bred sheep. Mr. Wallis' two pens were some of the best ever entered at any meeting, and about the heaviest in the Hall. Mr. Wallis himself is an Oxfordshire man, and the favourite sort sent against him were the Oxfordshire Downs. Some very good breeders could not reach higher than a commendation; and others, heretofore renowned, not even to that. There was more competition than usual with the Southdown and other Down sheep, where the West Country and Hampshires tried their fortunes, but with no effect. There were nine pens of Leicesters, and five of other Longwools, the excellence of many of the pens making up for the paucity of the entry; the Cotswolds more particularly being nearly all good. But one class each for these varieties is quite sufficient. In fact, the Leicesters could not make up their second. The great attraction of the sheep show, however, was, as it always has been here, with the Shropshire Downs, who are still getting better and better. Indeed the breeders of them are coming to think there are few such in the world, and are so very careful as to what they cross with. The Southdown has lately gone rather out of vogue with them. It is forty years since the Shropshires had horns, and by this they should be strong enough to go alone. Certainly in their own districts there are none can show, or yet more, "do" with them. The latter must be far the more important point of the two; for, really, showing a sheep is fast becoming little more than mere trickery. There were pens here—of short-wools and cross-breeds more particularly—that should have been at once condemned by the judges. The Society, in its published

conditions, makes a mild request that after a sheep has been once shorn, he should not be unfairly trimmed. But they should get their judges to enforce this. Perhaps the most telling way would have been to turn out two Downs, one as he is, and the other as he should be. In the latter case you cut all the wool close off his back, but leave it long on his carcase, to give him a springing rib and well-rounded appearance, taking care also to leave any other weak place thickly covered. The very knowing ones even go so far as to smear some kind of nastiness over the sheep—the backs particularly mind—so as to give people the notion that they had just been driven up in the rough off the turnips, and perhaps to prevent the curious from handling them too closely. If you do get in the pen you can hardly have half-an-inch hold on the top, while elsewhere your hand is buried in wool, very fine and good no doubt. But what do the judges mean by passing off such mal-practices on the public? Or why should those learned Professors Simonds and Hunt be so hard on the poor pigs, who are perhaps a little older than they admit, while the sheep are suffered to strut about padded like ancient bucks, or with a crinoline rotundity to their really ragged shanks? To serve such a leg of mutton properly, you should dress it as they do a hunted hare—with the skin on.

The pig show at Birmingham is always a good one; indeed, it ranks almost coequal with the poultry for peculiar attractions. It was signalized this year by the introduction of a distinct series of premiums for the Berkshire breed, which produced a very strong and encouraging entry, and quite sufficient to warrant the Council in the step they had taken. Some of the very high-bred ones had pedigrees as long as those of race-horses. As, for instance, a litter of Mr. Joseph Smith's, of Henley-in-Arden, is thus described:—"Age, 5 months and 3 weeks; pedigree—sire Gipsy Boy the Fourteenth by Champion, dam Gipsy Queen by a brawn bred by Sir Robert Throckmorton, grandam Longwaist by Longsides, g. g. dam Short Tail by Berkshire Pride; dam Cholsey Lass, sire Moreton Jack, g. sire Nonpareil, g. g. sire Magnum Bonum, g. g. sire Old Ben." And there were other exhibitors almost as learned in hog-flesh. The Countess of Chesterfield became at once famous for a white pig, of what we must call the Bretby breed, being not quite recognizable either as a Yorkshire or a Cumberland. The young pigs of the latter variety furnished altogether the best lot of any in the yard—Mr. Wiley, Mr. Watson, Mr. Hindson, and Mr. Mangles all sending some of their choicest. But, for their age, there was no approaching the Bransby first prize pen. One or two large whites were nearly as long as ships; and there were some improved Tamworths that, however, we seldom see elsewhere.

An exhibition of roots, very tastily arranged, and including some fine mangolds, brings the spectator gradually round to the poultry—the very Hamlet, as many think, of the whole play. According to the judges, this was the best poultry show ever known; but the judges at Birmingham talk proverbially in superlatives. Even those for stock deal out commendations and high commendations with such a liberal hand, that one really

comes to hardly regard them at all. There should be a limit to the best of intentions, or we defeat our own object. Still the poultry were almost generally good, while we never saw them in finer feather. The run at present is chiefly on the Dorking, Spanish, and Game; and we must admit we never saw such well-built, beautifully coloured, and smart-looking game-cocks as contended for the sweepstakes. Let us record Captain Hornby as the winner. Mr. Fowler, of Aylesbury, also deserves a word of especial praise, not so much this time for his white ducks as for his grey geese. One of these, the gander, was of the extraordinary and unprecedented weight of two-and-thirty pounds, and he had a pair of worthy helpmates with him. The trio, moreover, appeared by no means over-done, but were, on the contrary, very active and cheerful, showing none of that suffering a too-fat goose is popularly supposed to undergo in the process. The Rouen ducks and the Christmas turkeys come also in strong evidence of the good influence of the show; while the display of pigeons is gradually getting more and more imposing. But pigeon-fancying must be a business of itself, and without the book we do not remember the names even of half we saw. At any rate, the electric telegraph would appear by no means to have depreciated their value or importance.

Lord Spencer succeeds Lord John Scott as President of the Society. During the week Professor Tanner delivered two lectures on congenial themes, but the hour was ill-timed. Visitors cannot be expected to leave the yard at three o'clock in the afternoon, whereas had the evening been arranged for, there might have been a much better attendance.

PRIZE LIST.

FAT CATTLE.

JUDGES—Mr. George Bright, Broome, Acton-on-Clun, Salop.
Mr. Philip Halse, Molland, South Molton, Devon.
Mr. John Oatley, Bishton Hall, Shifnal.

HEREFORDS.

OXEN OR STEERS.

First prize £10, with GOLD MEDAL as best of all the oxen, the President's Silver Cup, value £25, as best ox or steer bred and fed by an exhibitor, the extra prize of £20, as the best Hereford, and Silver Medal as breeder (Mr. John Naylor, Leighton Hall, Welshpool).

Second, £5, Mr. Robert Swinerton, Weddington, Nuneaton.

Highly commended, Mr. John Shaw, Hunsbury Hill, Northampton; and the Earl of Aylesford, Packington.

Commended, His Royal Highness the Prince Consort, Windsor Castle.

STEERS.

(Under Three Years and Three Months Old.)

First prize £10, Mr. Isaac G. Niblett, Red Lodge, Ashley Hill, Bristol; Silver Medal to breeder, Mr. T. Meire, Cound Arbour, Shrewsbury.

Second, His Royal Highness the Prince Consort.

Highly commended, Mr. Isaac Niblett, Filton, Bristol.

Commended, Mr. John Carwardine, Stockton Bury, Leominster; and the Earl of Darnley, Cobham Hall, Gravesend.

COWS.

First prize £10, and Silver Medal as breeder, Mr. William Vaughan, Cholstrey, Leominster (had seven calves).

Second, £5, Mr. Richard Hill, Golding Hall, Shrewsbury (had three calves).

Commended, Mr. George Pitt, Chadnor Court, Dilwyn, Leominster (had eight calves).

HEIFERS.

First prize £10, and Silver Medal as breeder, Mr. William Stedman, Bedstone Hall, Shropshire.

Second, 5*l.*, Mr. Edward Price, Court House, Pembridge, Leominster.

Highly commended, Mr. Philip Turner, The Leen, Pembridge, Leominster.

(The class generally commended.)

SHORTHORNS.

OXEN OR STEERS.

First prize 10*l.*, and Silver Medal as breeder, Mr. William Root, Chipping Wardeu, Banbury.

Second, 5*l.*, Earl Spencer, Althorp, Northampton.

Highly commended, Mr. Joseph Phillips, Ardington, Wantage, Berkshire; and Mr. Matthew Savidge, Sarsden Lodge, Chipping Norton.

(The class commended.)

STEERS.

(Under Three Years and Three Months Old.)

First prize 10*l.*, and Silver Medal as breeder, Mr. Richard Stratton, Broad Hinton, Swindon.

Second, 5*l.*, the Hon. Col. E. D. G. Pennant, M.P., Penryn Castle, Bangor, Carnarvon.

The Sweepstakes in this class was won by Mr. Stratton's steer.

COWS.

First prize 10*l.*, with GOLD MEDAL as best of all the cows, and the extra prize of 20*l.* as the best Shorthorn, Mr. Robert Swinnerton. Silver Medal to breeder, Mr. John Evans, Chilvers Cotton, Nuneaton (had two calves).

Second, 5*l.*, Mr. Joseph Phillips, Ardington, Wantage (had two calves).

Commended, Mr. William Fletcher, Radmantbwaite, Mansfield (had one calf).

HEIFERS.

First prize 10*l.*, and Silver Medal as breeder, Mr. John W. Brown, Uffcott, Swindon.

Second, 5*l.*, Mr. Charles Hunt, Eign-street, Hereford.

Highly commended, Mr. Edmund Herbert, Powick, Worcester.

DEVONS.

OXEN OR STEERS.

First prize 10*l.*, and Silver Medal as breeder, Mr. George Turner, Barton, Exeter.

Second, 5*l.*, His Royal Highness the Prince Consort.

(The class highly commended.)

STEERS.

(Under Three Years and Three Months Old.)

First prize 10*l.*, with extra prize of 20*l.* as the best Devon, His Royal Highness the Prince Consort. Silver Medal to breeder, Mr. George Turner.

Second, 5*l.*, Mr. John Overman, Burnham Sutton, Burnham Market, Norfolk.

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

COWS.

First prize 10*l.*, the Earl of Leicester. Silver Medal to breeder, Mr. Richard Merson, Brinsworthy, North Molton, Devonshire (had five calves).

HEIFERS.

First prize 10*l.*, Mr. James John Farquharson, Langton, Blandford, Dorset. Silver Medal to breeder, Mr. James Quartley, Molland House, South Molton, Devon.

LONG-HORNS.

OXEN OR STEERS.

Prize 5*l.*, and Silver Medal as breeder, Mr. R. H. Chapman, Upton, Nuneaton.

COWS OR HEIFERS.

First prize 10*l.*, and Silver Medal as breeder, Mr. Thomaas Scatchwell, Knowle, Birmingham (had five calves).

Second, 5*l.*, Mr. R. H. Chapman, Upton, Nuneaton (had three calves).

OTHER PURE BREEDS AND CROSS-BRED.

OXEN OR STEERS.

First prize 10*l.*, and Silver Medal as breeder, the Duke of Beaufort, Badminton, Chippenham (Shorthorn and Gloucester).

Second, 5*l.*, Mr. James Stewart, New Market, Aberdeen (Shorthorn and Aberdeen).

Highly commended, Mr. James John Farquharson (Devon and Highlander).

Commended, Mr. David Lloyd, Llwyn-y-Maen, Owestry (Hereford and Shorthorn).

COWS.

First prize, 10*l.*, Mr. John Armstrong, Palterton (Cross-bred).

Second, 5*l.*, Mr. Aaron Pike, Mitton Farm, Tewkesbury (Shorthorn and Hereford).

Commended, Mr. John Faulkner, Bretby Farm, Burton-upon-Trent (Shorthorn, Cross).

HEIFERS.

First prize, 10*l.*, Mr. James Stewart, Aberdeen.

Second, 5*l.*, Mr. Edward Holland, M.P., Dumbleton Hall, Evesham (Shorthorn and mixed).

Highly commended, Mr. Samuel Druce, Eynsham, Oxford (Cross-bred).

SCOTCH.

OXEN OR STEERS.

First prize, £10, Mr. D. R. Corbet, Sundorne Castle, Shrewsbury.

Second, £5, the Duke of Beaufort.

Highly commended, Viscount Hill, Hawkstone, Shropshire.

WELSH.

OXEN OR STEERS.

First prize, £10, Mr. J. E. Bennett, The Grange, Husbands Bosworth.

Second, £5, Mr. B. E. Bennett, Marston Trussell Hall, Northampton.

EXTRA CLASSES.

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

OXEN OR STEERS.

Prize of £5, Mr. William Eagles, Cropredy, near Banbury.

COWS OR HEIFERS.

Prize £5, and Mr. Otley's GOLD MEDAL as best cow or heifer bred and fed by an exhibitor, Mr. Henry Smith, Drax Abbey, Selby, Yorkshire (Shorthorn.)

Highly commended, Sir Robert Peel, Bart., M.P., Drayton Manor (Shorthorn); Mr. J. Armstrong, Palterton (Shorthorn).

SHEEP.

JUDGES—Mr. Edward Gough, Gravel Hill, Shrewsbury.

Mr. John Moon, Old Alresford, Hampshire.

Mr. William Sanday, Holme Pierrepont, Notts.

LEICESTERS.

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

First prize £10, extra prize £10 as best pen of Longwools, and Silver Medal as breeder, Mr. G. S. Foljambe, Osberton Hall, Worksop.

Second, £5, Mr. G. S. Foljambe.

Highly commended, Mr. Abraham Nurse, Ashby Parva, Leicester.

Commended, Mr. John Boast, North Dalton, Great Driffield, Mr. Francis Jordan, Easthuru, Driffield.

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

[No entry.]

LONG-WOOLLED SHEEP, NOT BEING LEICESTERS.

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

First prize £10, and Silver Medal as breeder, Mr. Thomas West, Green Hill Farm, Bletchington, Oxfordshire (Cotswold.)

Second, £5, Mr. Charles Kearsey, Glewstone, near Ross, Herefordshire (Cotswold.)

Commended, Mr. John Shaw, Hunsbury Hill.

SOUTH AND OTHER DOWN SHEEP.

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

First prize £10, extra prize £10 as best pen of Shortwools, and Silver Medal as breeder, Lord Walsingham, Merton Hall, Thetford, Norfolk (Southdown.)

Second, £5, the Earl of Leicester (Southdown.)

Highly commended, Lord Walsingham (for two other pens of Southdowns); the Earl of Leicester (for another pen of Southdowns.)

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

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

Overman, Burnham Sutton, Burnham Market, Norfolk (South-down.)

Second, £5, Sir Robert George Throckmorton, Bart., Buckland, Farrington, Berkshire (Southdown.)

Commended, Lord Walsingham (Southdown), the Earl of Leicester (Southdown.)

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

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

First prize £10, and Silver Medal as breeder, Mr. Edward Holland, M.P., Dumbleton Hall (Shropshire.)

Second, £5, Mr. J. B. Green, Marlow, Herefordshire (Shropshire.)

Highly commended, Mr. Henry Smith, jun., Sutton Mad-dock, Shiffual (Shropshire.)

Commended, Mr. Henry Smith, jun. (for another pen of Shropshire.)

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

First prize, £10, and Silver Medal as breeder, Mr. William O. Foster, M.P., Kiuver Hill Farm, Stourbridge (Shropshire.)

Second, £5, William O. Foster (Shropshire.)

Highly commended, Mr. Henry Smith, jun. (Shropshire.)

Commended, The Earl of Aylesford (Shropshire), Mr. Henry Smith, jun. (Shropshire.)

CROSS-BRED SHEEP.

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

First prize £10, Silver Medal as breeder, and extra Silver Medal as best pen of cross-bred sheep, Mr. William Talbot Wallis, Shifford Lodge, Bampton, Oxfordshire.

Second, £5, Mr. William Talbot Wallis.

Highly commended, the Earl of Leicester (for 2 pens of Leicester and Southdown); Mr. George B. Morland, Chilton Farm, Harwell, Berkshire (for 2 pens of Southdown and Cotswold); and Mr. John Woolston, Wellingborough, Northamptonshire (Southdown and Cotswold).

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

First prize, £10, and Silver Medal as breeder, Mr. Adam C. Keep, Wollaston, Northamptonshire (Southdown and Cotswold).

Second, £5, Mr. Adam C. Keep (Southdown and Cotswold.)

P I G S .

JUDGES.—Mr. Edward Gough, Gravel Hill, Shrewsbury.

Mr. John Moon, Old Alresford, Hampshire.

Mr. William Sanday, Holme Pierrepont, Notts.

FAT PIGS.

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

First Prize £10, and Silver Medal as breeders, Messrs. Jones and Isaac Bate, King's Heath, Birmingham.

Second, £5, Mr. Henry W. Dashwood, Dunstew, Woodstock.

Commended, the Countess of Chesterfield, Brethly Hall, Burton-upon-Trent; Mr. Thomas R. B. Cartwright, Aynho, Brackley, Northamptonshire.

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

First prize £10, and Silver Medal as breeder, the Countess of Chesterfield.

Second, £5, Countess of Chesterfield.

Commended, Messrs. James and Isaac Bate.

(Fig, exceeding fifteen months old.)

First prize £6, and Silver Medal as breeder, Mr. George Beale, Trolesworth, Lutterworth.

Second, £3, Mr. George Beale.

Highly commended, Mr. James Marriott, Floore, near Weedon, Northamptonshire.

Commended, Mr. William Fowler, jun., Wood End Cottage, Erdington; and Mr. John Spencer, Villiers Hill, Kenilworth.

BERKSHIRE BREEDING PIGS.

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

First Prize £10, and Silver Medal as breeder, Mr. George Holyoake, Ncachley, Shiffual.

Second, £5, Mr. Joseph Smith, Henley-in-Arden, Warwickshire.

SILVER MEDAL to Mr. Hastings Sanderson, Gannaway Farm, Warwick; Mr. T. B. Wright, The Quarry House, Great

Barr; Mr. William Cooper, Impaley Farm, Henley-in-Arden; and Mr. Walter J. B. Scott, Queen's Hotel, Birmingham.

Highly commended, Mr. Robert Overbury, Henley-in-Arden.

Commended, Mr. Edward Freer, jun., Digbeth, Birmingham; and the Rev. Henry G. Bailey, The Vicarage, Swindon, Wiltshire.

PIGS OF OTHER LARGE BREEDS.

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

First prize £10, and Silver Medal, Mr. William B. Wainman, Esq., Carhead, Cross Hills, Yorkshire (Carhead breed).

Second, £5, Mr. William Endall, Beaudesert Park Farm, Henley-in-Arden (improved Tamworth).

Highly commended, Mr. William Endall (improved Tamworth.)

PIGS OF A SMALL BREED.

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

First prize £10, and Silver Medal as breeder, Mr. Samuel Wiley, Brandsby, Yorkshire (white).

Second, £5, Mr. Samuel Wiley (white).

Silver Medal, Mr. Robert H. Watson, Bolton Park, Wigton, Cumberland (white).

Silver Medal, Mr. Joseph Hindson, Barton House, Everton, Liverpool (white).

Highly commended, Mr. Samuel Wiley (white).

Commended, Mr. Geo. Mangles, Givendale, Ripon (white).

The following certificates were given as to pens of pigs disqualified :

“ Birmingham, Nov. 27th, 1858.

“ We hereby certify that the state of the dentition of one of the pigs in Pen 210, shows that the animal exceeds the age of the other two, and also that it is older than set forth in the owner's certificate.

“ JAMES B. SIMONDS,

(Referee for age of Pigs.

“ ROBERT L. HUNT,

“(Veterinary Inspector).”

“ Birmingham, Nov. 27th, 1858.

“ We hereby certify that the pig shown in Pen 235 is of greater age than described in the owner's certificate.

“ JAMES B. SIMONDS.

“ ROBERT L. HUNT.”

PRIZES FOR ROOTS.

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

A SILVER CUP, VALUE TEN GUINEAS, GIVEN BY THE MAYOR OF BIRMINGHAM, FOR THE BEST COLLECTION OF FOUR VARIETIES OF LONG MANGOLD WURZEL, GLOBE MANGOLD WURZEL, SWEDES, AND CARROTS; SIX ROOTS OF EACH.

Mr. John B. Starkey, Spyre Park, Chippenhan.

Second, Five guineas, Mr. Richard Benyon, Englefield House, Berkshire.

BEST SIX SWEDE TURNIPS.

SILVER CUP, value Ten guineas, given by Messrs. ADKINS.

Mr. Charles Holland, Top Farm, Keele, Staffordshire.

LONG MANGOLD WURZEL.

First prize, Two guineas, Mr. John B. Starkey.

Second, One guinea, Mr. Charles Pratt, Stratford-upon-Avon.

Commended, Mr. Saml. Robinson, Shaw House, Melbourn, Derbyshire; Mr. Richard Benyon; and Mr. W. Horsburgh, Bournfield Farm, Bradfield, Berkshire.

GLOBE MANGOLD WURZEL.

First prize, Two guineas, Mr. W. Horsburgh.

Second, One guinea, Mr. R. Benyon.

Highly commended, Mr. J. B. Starkey.

Commended, Mr. James Innes, Wroxton Abbey, Banbury; Mr. George B. Morland, Chilton; and Rev. Thos. Stevens, Bradfield Rectory, Reading.

SWEDES OF ANY VARIETY.

First prize, Two guineas, Mr. C. Holland, Top Farm, Keele, Staffordshire.

Second, One guinea, Mr. Charles Kearsley, Glewstone, Ross, Herefordshire.

COMMON TURNIPS.

First prize, Two guineas, Mr. C. Kearsy.
 Second, One guinea, the Duke of Portland, Clipstone Park Farm, Mansfield, Nottinghamshire.
Commended, Mr. G. Mangley.

CARROTS OF ANY VARIETY.

First prize, Two guineas, Mr. G. S. Foljamhe, Osberton Hall.
 Second, One guinea, the Duke of Portland.
Highly commended, Mr. George Mackenzie Kettle, Dallicott House, Bridgnorth.
Commended, Mr. Thos. Barratt, Market Drayton.

OX CABBAGE.

First prize, Two guineas, Mr. S. Robinson, Shaw House, Melbourne, Derbyshire.
 Second, One guinea, Mr. Samuel Perry, Shipley, Bridgnorth.

POTATOES.

First prize, Two guineas, Mr. S. Robinson.
 Second, One guinea, Mr. W. A. Lyndon, King's Heath, Birmingham.
Commended, Mr. G. Mangley; and the Rev. T. Stevens.
Disqualified on account of six varieties only being sent instead of twelve, Mr. Horsburgh and Mr. Benyon.

RUTLAND AGRICULTURAL SHOW.

The annual exhibition of stock in connection with the Rutland Agricultural Society has long maintained a high character, and that which took place in the Riding School at Oakham, on Wednesday, Dec. 1, was certainly no exception to the general rule of excellence. Connoisseurs in cattle were there afforded an opportunity of inspecting a splendid collection of animals in the several classes, not a few of which may confidently be expected to take honours next week at Smithfield, where Rutland and Lincolnshire agriculturists have repeatedly distinguished themselves in years gone by. To notice the stock in detail would occupy more space than we can spare, and indeed would be superfluous, seeing that the list of awards given below will sufficiently indicate the more prominent features of the show. We may, however, mention that the red and white three years and ten months old ox, which obtained for the Marquis of Exeter the first prize of £15 in the class open to all England, was a most splendid animal, and commanded universal admiration. The rival animal exhibited by Mr. Marriott, of Fletton, which received the second prize, was well worthy of its position. Mr. Swingler, of Langham, and Mr. Wortley, of Ridlington, were the other competitors in this class; the ox shown by the first-named gentleman being commended by the judges. Of the horned cattle in all the other departments suffice it to say that the merit stood high, and that their breeders may rejoice in a well-earned reputation. It may not be uninteresting here to note that a portion of this choice beef is likely to form the staple of the Christmas dinners of some of the good people of Stamford; Mr. Payne, butcher of this town, having purchased the extraordinary steer exhibited by R. W. Baker, Esq., in class 5, in which it took the first prize; whilst Mr. Riley became the owner of the remarkably fine heifer, which gained a premium for the Earl of Gainsborough. As usual, Mr. Bradshaw, of Burley, was "A 1" in sheep, the display of which was highly creditable to the several exhibitors. Of horses there was a goodly array, both for the hunting field and for the general purposes of agriculture; while the show of pigs was pronounced even above the average of former years. A few well-grown roots and vegetables completed an exhibition eminently worthy as a whole of the highest commendation. The day being delightfully fine, there was a large influx of the neighbouring agriculturists into Oakham, and the handsome sum of £24 was received for admission to the show-house—a building, by the way, admirably adapted for the purpose, and affording protection against all vicissitudes of weather. Amongst the visitors were the under-named: Lord Aveland, the Hon. G. H. Heathcote, M.P., the Hon. G. J. Noel, M.P., Hon. H. Noel, G. Finch, Esq., Col. Lowther, J. M. Wingfield, Esq., the Rev. H. J. Fludyer, J. Eagleton, Esq., R. W. Baker, Esq., E. Freke, Esq., R. Lucas Esq., W. A. Pochin, Esq., R. D. Bradshaw, Esq., T. Syson, Esq., &c., &c.

Early in the afternoon, the labourers and others who had been successful in obtaining premiums were regaled with a substantial dinner at the Red Lion, after which the prizes were distributed by the Hon. H. Noel, who offered some encouraging and approving remarks to the recipients. They were also addressed by the Rev. Thos. Davidson, of Hambleton.

We have only here to add, that the difficult duty of deciding upon the respective merits of the stock, &c., exhibited in the various departments, devolved upon the following gentlemen:—

JUDGES OF STOCK.—J. Spencer, Esq., Odstone Hall, Atherstone, Warwickshire; W. Parke, Esq., Stragglesthorpe Hall, Lincolnshire; F. Spencer, Esq., Alma House, Leicester-shire.

JUDGES OF HUNTING HORSES.—R. Lucas, Esq., Edith-weston Hall; W. A. Pochin, Esq., Edmondthorpe Hall; the Hon. G. J. Noel, M.P., Exton Park.

JUDGES OF VEGETABLES.—Mr. T. Y. Bunning, Empingham; Mr. T. W. Fowler, Exton; Mr. G. Wood, Teigh.

Their awards were given as under-stated:—

To the feeder of the best fat ox or steer, 15*l.*, to the Most Noble the Marquis of Exeter, K.G., an ox, three years and ten months old; second prize, 7*l.*, to Mr. S. Marriott, of Fletton; Mr. T. Swingler commended. Four entries.

Oxen or steers, of any breed or weight, under four years of age.—First prize, 10*l.*, to Mr. E. Wortley, of Ridlington; second, 5*l.*, to Mr. T. Swingler, of Langham. Three entries.

Cows or heifers, of any breed, age, or weight.—First prize, 10*l.*, to Mr. T. Swingler, of Langham; second, 5*l.*, to the Right Hon. the Earl of Gainsborough. Three entries.

To the owner, being a tenant-farmer, of the best steer, under three years of age.—First prize, 7*l.*, R. W. Baker, Esq., of Cottesmore; second, 3*l.*, Mr. T. Swingler, of Langham; Mr. W. Franklin, of Barford Lodge, commended. Three entries.

To the owner, being a tenant-farmer, of the best steer, under two years of age.—First prize, 5*l.*, to R. W. Baker, Esq.; second, 3*l.*, Mr. T. Swingler. Three entries.

To the owner, being a tenant farmer, of the best heifer, above two and under three years of age.—First prize, 6*l.*, to Mr. T. Chapman, of Whitwell; second, 3*l.*, to Mr. T. Swingler; Mr. G. Wyman commended. Six entries.

To the owner, being a tenant-farmer, of the best heifer, under two years of age.—First prize, 4*l.*, to Mr. T. Chapman; second, 2*l.*, to C. O. Eaton, Esq., of Tixover Hall. Four entries.

Offered by Stafford O'Brien, Esq.

To the owner, being a tenant-farmer, of the best cow in-milk.—First prize, 5*l.*, to Mr. C. J. Bradshaw, of Burley-on-the-Hill; second, 2*l.*, to Mr. T. W. Fowler, of Exton; C. O. Eaton, Esq., highly commended. Seven entries.

Offered by the Society.

To the exhibitor of the best bull, above one and under four years old.—First prize, 10*l.*, to Mr. J. Lynn, of Stroxton; second, 5*l.*, to the Right Hon. the Earl of Gainsborough; Mr. R. Scarsion, of Deeping St. James, commended. Six entries.

To the exhibitor of the best mare, 3*l.*, to Mr. R. Hawley, of Oakham; Mr. J. Royce, Seaton, commended. Twelve entries.

To the exhibitor of the best yearling gelding or filly for agricultural purposes, 3*l.*, to Mr. W. Fahling, of Burley-on-the-hill; Mr. E. Fryer, commended. Four entries.

Offered by the Right Hon. the Earl of Gainsborough.

(To tenant occupiers of not more than 30 acres in the district.)

To the owner of the best cow in milk, 5*l.* to M. G. Chester, of Waltham; second, 2*l.*, to Mrs. J. Harria, of Langham. Four entries.

To the owner of the best heifer, under two years and six months old at the time of showing, 4*l.*, to Mrs. J. Harria; second, 2*l.*, to Mr. G. Chester.

To the owner of the best heifer calf, under six months old

at the time of showing, 2*l.*, to Mr. W. Hubbard, of Langham; second, 1*l.* to Mr. N. Needham, of Hambleton. Four entries. Offered by the Right Hon. Lord Aveland.

Long-woolled fat wether sheep, a silver cup, value 10*l.*, to Mr. C. J. Bradshaw, Burley-on-the-hill; second, 5*l.* (offered by the Society), W. D. Capell Brooke, Esq., of Geddington Grange, near Kettering. Five entries.

Offered by the Society.

To the owner, being a tenant-farmer, of the best long-woolled fat wether sheep one year old, 7*l.* to M. C. J. Bradshaw; second, 4*l.*, to Mr. E. Wortley, Ridlington. Three entries.

To the owner, being a tenant farmer, of the best breeding ewes, 5*l.*, to Mr. C. J. Bradshaw; second, 3*l.*, to Mr. E. Ridlington.

Long-woolled fleaves, one year old, 4*l.* to the Hon. Colonel Lowther, of Barleythorpe; second, 2*l.*, to R. W. Baker, Esq., Cottesmore; Mr. C. J. Bradshaw highly-commended. Five entries.

Long-woolled wether lambs, 3*l.*, to Mr. E. Wortley; second, 2*l.*, to the Hon. Colonel Lowther; Mr. C. Bradshaw, commended. Five entries.

Long-woolled ewes, 3*l.*, to the Hon. Colonel Lowther; second, 2*l.*, to Mr. C. J. Bradshaw. Five entries.

Pigs of any breed, weight above 20 stone, and under 18 mouths old, £4, to Mr. Bryan, of Ridlington; second, £2, to Mr. W. Carver, of Ingarsby; R. W. Baker, Esq., commended. Five entries.

Pigs of any breed or weight, £3, to Mr. W. Carver; second, £2, to Mr. J. Stimson, of Egleton. Six entries.

Offered by the Right Hon. the Earl of Gainsborough.

To the owner of the best fat pig, £2, to Mr. T. Needham, of Egleton; second, £1, Mr. T. Gregory, of Egleton. Five entries.

Offered by the Society.

To the owner of the best in-pigged or suckling sow or yelt, £2, to Mr. J. Lynn, of Stroxtton. Four entries.

Offered by the Most Noble the Marquis of Exeter.

To the owner of the best half-bred four years old hunting

mare or gelding, £10, to Mr. W. Allsoop, of Garthorpe; second (offered by the Gentlemen of the Cottesmore Hunt), £5, to Mr. J. Stokes, of Broughton Sulney. Nine entries.

Offered by his Grace the Duke of Rutland.

To the exhibitor of the best beast shown as extra stock, a silver medal, value £3, to C. O. Eaton, Esq., of Tixover Hall; Mr. T. Suter, of Brook, highly commended. Seven entries.

Offered by the Tradesmen of Oakham.

To the exhibitor of the best sheep as extra-stock, a silver medal, value £3, to Mr. C. J. Bradshaw, of Burley-on-the-Hill; W. De Capell Brook, Esq., of Geddington Grange, highly commended; Messrs. J. and R. Painter, of Burley-on-the-Hill, commended. Six entries.

ROOTS AND VEGETABLES.

Offered by the Right Hon. Viscount Campden.

For Swedish turnips, cultivated on any system, £7, to Mr. W. Berridge, of Barrow; second, £3, to Mr. E. Wortley, of Ridlington.

Offered by the Hon. Gerard James Noel, M.P.

For Swedish turnips, a silver cup, value £10, to R. W. Baker, Esq., of Cottesmore.

Offered by the Tradesmen of Oakham.

For Swedish turnips. No entry.

Offered by the Society,

For mangold wurtzel, £2, to Mr. Suter, of Brooke; W. Fabling, Esq., of Burley-on-the-Hill, commended.

Offered by the Hon. Roden Noel.

For mangold wurtzel, £3, to W. R. Morris, Esq., of North Luffenham; the Right Hon. the Earl of Gainsborough, highly commended.

Offered by the Society.

For cabbages, £1, to W. Fabling, Esq., of Burley-on-the-Hill; Mr. Wortley, of Ridlington, commended.

Offered by the Tradesmen of Oakham.

For white turnips, a silver cup, value £5, to Mr. Christian, of Barrow; Mr. Smith, of Extou, commended.

GLOUCESTER AGRICULTURAL ASSOCIATION.

The united Agricultural Societies of this county held their annual meeting at Gloucester, on Thursday, December 2.

The judges of stock, &c., were Mr. J. Wigmore, Mr. P. Rich, and Mr. E. Blewitt; of cheese, Mr. E. Brotherton, Mr. D. Niblett, and Mr. J. Savory. The following was the award:

SHORTHORNS AND OTHER BREEDS, EXCEPT HEREFORDS AND DEVONS.

The Gift of the Right Hon. Earl Ducie.

For the best bull above two years old, £10, Mr. Richard Stratton, Broad Hinton; second best, £5, Mr. John Hall, Syde, near Cirencester.

For the best bull, above one and under two years old, £10, Mr. William Hewer, of Sevenhampton, near Highworth.

The gift of W. P. Price, Esq., M.P.

Second best, £5, Mr. John W. Brown, of Offcott, near Swinden.

Society's Premium.

For the best bull-calf, bred by the exhibitor, and under 12 months old, £5, Mr. Richard Stratton, Broad Hinton.

The Gift of G. H. Bengough, Esq.

For the best bull, cow, and their offspring, £10, Mr. Thos. Game, Broadmore, near Northleach.

Society's Premiums.

Second best, £5, Mr. J. H. Langston, M.P., Sarsden.

For the best cow, in-calf or in-milk, £6, Mr. Richard Stratton, of Broad Hinton, near Swinden; second best, £3, Mr. J. H. Langston, M.P., Sarsden.

The Gift of J. H. Langston, Esq., M.P.

For the best pair of heifers, in-calf or in-milk, under 3 years old, bred by the exhibitor, £10, Mr. Edward Bowly, of Siddington.

Society's Premium.

Second best, £5, Mr. William Woodward, of Northway House, Ashchurch.

The Gift of Edward Holland, Esq., M.P.

For the best pair of breeding heifers, under two years old, bred by the exhibitor, £8, Mr. John Lane, of Cirencester.

Society's Premium.

Second best, £4, Mr. J. H. Langston, M.P., Sarsden.

HEREFORDS AND DEVONS.

The Gift of the Right Hon. Earl Bathurst.

For the best bull above two years old, £10, Mr. W. G. Burnett, North Cerney.

Society's Premium.

Second best, £5, Mr. John Williams, of St. Mary's, Kingsland, Herefordshire.

The Gift of Sir C. W. Codrington, Bart., M.P.

For the best bull, above one and under two years old, £10, Mr. Edward Price, of Pembridge, Herefordshire.

Society's Premiums.

Second best, £5, Mr. Thomas Edwards, Wintercote, near Leominster.

For the best bull calf, bred by the exhibitor, and under twelve months old, £5, Mr. William Perry, of Cholstrey, Herefordshire.

The Gift of the Right Hon. Earl Beauchamp.

For the best bull, cow, and offspring, £10, Mr. R. Keene, of Pencaig, Monmouthshire.

Society's Premium.

Second best, £5, Mr. Thomas Duckham, of Baysham, near Ross.

The Gift of Robert Stayner Holford, Esq., M.P.

For the best cow, in calf or in milk, £6, Mr. W. G. Bennett, North Cerney.

Society's Premium.

Second best £3, Mr. Edward Price, of Pembridge, Herefordshire.

The Gift of Robert Stayner Holford, Esq., M.P.

For the best pair of heifers, in calf or in milk, under three years old, bred by the exhibitor, £10, Mr. J. E. L. Hewer, jun., Vern-house, Herefordshire.

Society's Premium.

Second best £5, Mr. William Perry, of Cholstrey, Herefordshire.

For the best pair of breeding heifers, under two years old, bred by the exhibitor, £8, Mr. Edward Price, of Pembridge, Herefordshire; second best £4, Mr. Thomas Pope, of Horningsham, near Warmiuster.

FAT CATTLE.

The Gift of the Hon. W. L. Bathurst.

For the best fat steer of any breed, £6, the Duke of Beaufort, Badminton.

Second best, £4, Mr. Richard Stratton, Broad Hinton, near Swindon.

The Gift of his Grace the Duke of Beaufort.

For the best fat cow, having had a calf at its full time, £6, Mr. E. Price, of Pembridge, Herefordshire.

Second best, £4, Mr. Henry Higgins, Woolaston Grange, near Lydney.

LONG WOOLS.

The Gift of Captain Bathurst, M.P.

For the best five breeding ewes, not more than 35 months old, £8, Mr. Wm. Smith, of Bibury, near Fairford.

Society's Premiums.

Second best, £4, Mr. Edmund Ruck, of Castle-hill, near Cricklade.

For the best five breeding theaves, not more than 23 months old, £3, Mr. E. Ruck, of Castle-hill, Cricklade.

Second best, £4, Mr. William Smith, of Bibury, near Fairford.

For the best five ewe lambs, not more than 11 months old £5, Mr. Wm. Smith, Bibury, near Fairford.

The Gift of the Right Hon. Earl of St. Germans.

For the best five breeding ewes, not more than 35 months old, £5, Mr. E. Holland, M.P., Dumbleton Hall.

Society's Premiums.

For the best five breeding theaves, not more than 23 months old, £5, Sir Robt. G. Throckmorton, of Buckland Park, Faringdon.

Second best, £2 10s., Mr. Edward Holland, M.P., Dumbleton Hall.

CROSS BREED.

The Gift of Thomas Strunge, Esq.

For the best five breeding ewes, not more than 35 months old, £5, Mr. William Hemming, of Coldicott, near Moreton-in-the-Marsh.

Society's Premiums.

For the best five breeding theaves, not more than 23 months old, £5, Mr. John King Tombs, of Langford, near Lechlade.

Second best, £2 10s., Mr. Charles Hobbs, of Maiseyhampton, near Cricklade.

FAT SHEEP.—LONG WOOLS.

The Society's Premiums.

For the best three ayearhogs, not more than twenty-three months old, 5*l.*, Mr. Charles Kearsy, Glewstone, near Ross; second best, 2*l.* 10*s.*, Mr. W. Slatter, of Stratton, near Cirencester.

For the best five wether tegs, not more than eleven months old, 5*l.*, Mr. W. Joshua, Perrott's Brook, near Cirencester.

For the best three fat ewes, 5*l.*, Mr. Edmund Ruck, of Castle Hill, near Cirencester.

SHORT WOOLS.

Society's Premiums.

For the best three shearhogs, not more than twenty-three months old, 5*l.*, Mr. Charles Hobbs, of Maiseyhampton, near Cricklade.

CROSS BREED.

Society's Premiums.

For the best three shearhogs, not more than twenty-three months old, 5*l.*, Mr. Charles Hobbs, of Maiseyhampton, near Cricklade; second best, 2*l.* 10*s.*, Mr. John Plumbe, of Ashton Keynes, near Cricklade.

PIGS.

The Gift of T. Gambier Perry, Esq.

For the best boar pig under a year old, 4*l.*, Mr. Edward Bowly, of Siddington.

The Gift of T. B. Lloyd Baker, Esq.

For the best three sow pigs, of the same litter, under four months old, 4*l.*, Mr. W. Hemming, of Coldicott, near Moreton-in-Marsh.

The Gift of J. H. Elwes, Esq.

For the best sow pig for breeding purposes, 3*l.*, Mr. Henry Tovey, of Stanton, near Highworth.

For the best sow and pigs, her own produce, the pigs under ten weeks old, 3*l.*, Mr. William Hewer, of Sevenhampton, Highworth.

HORSES.

Society's Premiums.

For the best mare and foal (her own offspring) for agricultural purposes, 8*l.*, Mr. T. W. Swinburne, Cordean Hall, near Winchcomb; second best, 4*l.*, Mr. Wm. Moore, Upton-on-Severn.

For the best stallion, for agricultural purposes, above two years old, 10*l.*, Mr. Isaac Theyer, of Walford, near Ross.

The Gift of Robert Gordon, Esq.

For the best filly for agricultural purposes, under three years old, 5*l.*, Mr. J. Gay Attwater, of Hallingwood, Cheltenham

ROOT SHOW OF THE BOTLEY AND SOUTH HANTS FARMERS' CLUB.

AWARD OF PRIZES.

A prize of £5, given by Thomas Chamberlayne, Esq., of Cranbury Park, for the best ten acres of swedes.—Mr. F. Hewer, Nursling; 135 roots per rod; weight, 15 tons 8 cwt. 64lbs. per acre. A prize of £2, given by G. Hunt, Esq., for the second best ditto. Mr. W. Warner, Botley; 122 roots per rod; weight, 15 tons 2 cwt. 96lbs. per acre. Mr. W. Hooper, Hound, had 120 roots per ton, weighing 12 tons 7 cwt. 16lbs. per acre.

A prize of £3, given by Steuart Macnaghten, Esq., of Bitterne Manor House, for the best ten acres of swedes.—Mr. Caleb Gater, Town Hill; 144 roots per rod; weight, 20 tons 15 cwt. 80lbs. per acre. A prize of £1 for the second best ditto. Mr. Thomas Warner, Botley; 108 roots per rod; weight, 15 tons 5 cwt. 80lbs. per acre. Mr. Richard Pink had 118 roots per rod, weighing 14 tons per acre. Mr. Hooper Hound had 120 roots per rod, weighing 11 tons 15 cwt. 80lbs. per acre.

A prize of £3, given by Messrs. Spooner and Bailey, for the best four acres of swedes, raised by means of artificial manures only.—Mr. R. Trench, Freehills; 96 roots per rod; weight, 15 tons per acre. Mr. Colson had 103 roots per rod, weighing 13 tons 2 cwt. 96lbs. per acre. Mr. Waters, Durley, had 72 roots per rod, weighing 12 tons 8 cwt. 64lbs. per acre. Mr. H. Woodbridge, Meanstoke, had 92 roots per rod, weighing 10 tons 17 cwt. 16lbs. per acre.

A prize of £3, given by Messrs. Dixon and Cardus, for the best six acres of common turnips.—Mr. Caleb Gater, Town Hill; 116 roots per rod; weight, 16 tons 15 cwt. 10lbs. per acre. Mr. James Withers, Durley, had 116 roots per rod, weighing 15 tons 1 cwt. 48lbs. per acre. Mr. Colson had 132 roots per rod, weighing 12 tons per acre. Mr. Holdaway, Uplands, had 110 roots per rod, weighing 9 tons 19 cwt. 14lbs. per acre.

A prize of £2, given by Caleb Gater, Esq., for the best four

acres of turnips, raised by means of artificial manures only, and grown as a second crop, after peas, vetches, rye, &c., and sown after June 20th.—Mr. Caleb Gater, Town Hill; 170 roots per rod; weight, 10 tons per acre. Mr. William Warner, Botley, had 70 roots per rod, weighing 5 tons 15 cwt. per acre.

A prize of £3, given by Mr. Harris, for the best six acres of mangold wurtzel.—Mr. Thomas Warner, Botley; 101 roots per rod; weight, 24 tons 1 cwt. 48lbs. per acre. Mr. Caleb Gater had 119 roots per rod, weighing 21 tons 15 cwt. per acre.

A prize of £2, given by Messrs. Page and Toogood, for the best three acres of mangold wurtzel.—Mr. Joseph Blundell, Bursledon; 87 roots per rod; weight, 37 tons 10 cwt. per acre. Mr. W. Draper, Hound. (Weight not stated in list).

A prize of £1, for the best one acre of mangold wurtzel. Mr. R. Trench, Freehilla; 112 roots per rod; weight, 27 tons 11 cwt. 48lbs. per acre.—Mr. W. Warner, Botley, had 103 roots per rod, weighing 21 tons per acre. Mr. James Withers, Durdley, had 92 roots per rod, weighing 18 tons 17 cwt. 16lbs. per acre.

A prize of £2, given by W. Warner, Esq., for the best two acres of carrots.—Mr. Croakey, Sanwick, 545 roots per rod; weight, 23 tons 17 cwt. 16lbs. per acre.

A prize of £1 for the best one acre of carrots.—Mr. Joseph Blundell, Bursledon; 395 roots per rod; weight, 19 tons 4 cwt. 12lbs. per acre. Mr. R. Trench, Freehills, had 460 roots per rod, weighing 16 tons 1 cwt. 48lbs. per acre.

A prize of 30s. for the best six acres of stubble turnips.—Mr. Joseph Blundell; 250 roots per rod; weight, 6 tons per acre. Mr. Thomas Warner commended.

A prize of 15s. for the best three acres of ditto.—Mr. Joseph Blundell; 170 roots per rod; weight, 5 tons 8 cwt. 64lbs. per acre. Mr. R. Trench commended.

A prize of 15s. for the six heaviest swedes.—Mr. Pullenger,

Curdridge; 6 roots, weighing 63lbs. Mr. Dickinson, New Park, had six roots, weighing 57lbs.—Mr. C. J. Gale, Kit-nocks, had six roots, weighing 49lbs.

A prize of 10s. for the six best-shaped awedes.—Mr. Pullinger, Curdridge.

A prize of 10s. for the six best-shaped Skirving awedes.—Mr. George Hunt.

A prize of 10s. for the six heaviest turnips.—Mr. James Withers, Durdley; six roots, weighing 62lbs. Mr. William Hooper, Hound, six roots, weighing 48lbs.

A prize of 10s. for the best-shaped green round turnips.—Mr. James Warner, Curdridge.

A prize of 5s. for the six best-shaped white round turnips.—Mr. James Withers, Durdley.

A prize of 5s. for the six best-shaped red round turnips.—Mr. Longman.

A prize of 5s. for the six heaviest stubble turnips.—Mr. Sillence, Compton; 6 roots, weighing 19lbs. Mr. Blundell, Bursledon, had six roots, weighing 13lbs.

A prize of 10s. for the six heaviest red mangold wurtzel.—Mr. Dickinson, New Park; six roots, weighing 96lbs. Mr. C. H. Gater, Town Hill, had six roots, weighing 90lbs. Mr. Charles Pink, Wood End, had six roots, weighing 84lbs. Mr. George Hunt had six roots, weighing 80lbs.

A prize of 10s. for the six heaviest yellow mangold wurtzel.—Mr. Dickinson, New Park; six roots, weighing 120lbs. Mr. Blundell, Bursledon, had six roots, weighing 117lbs. Mr. Rose, Totton, had six roots, weighing 91lbs.

A prize of 10s. for the six heaviest carota.—Mr. Jonas, Bishop's Waltham; six roots, weighing 26½lbs. Mr. Dickinson, New Park, had six roots, weighing 24lbs. Mr. Blundell, Bursledon, had six roots, weighing 23lbs. Mr. T. Warner, Botley, had six roots, weighing 22lbs.

DAIRIES AND BONE MANURE.

It was a wise saying that he who made two blades of grass to grow in the place of one was a benefactor to mankind. The Cheshire dairy farmer, by the free use of bone manure, laid on his grass lands, makes his farm, which at one time, before the application of bone manure, fed only 20 head of cows, now feed 40!

In Cheshire two thirds or more, generally three fourths, of a dairy farm are kept in permanent pasture, the remainder in tillage. Its dairy farmers are commonly bound to lay the whole of their manure, not on the arable, but on the grass land, purchasing what may be necessary for the arable. The chief improvement, besides drainage, consists in the application of bone manure. In the milk of each cow, in its urine, in its manure, in the bones of each calf reared and sold off, a farm parts with as much earthy phosphate of lime as is contained in half a hundred weight of bone dust. Hence the advantage found in returning this mineral manure by boning grass lands. It is considered that draining and boning four acres of land will yield such an additional quantity of grass that each acre so treated will summer one cow. But if land be not boned, and of similar quality to that which has been boned, two acres are generally, in Cheshire, required to keep one cow in summer.

The quantity of bones now commonly given in Cheshire to an imperial acre of grass land is about 12 or 15 cwts. This dressing on pastured land will last seven or eight years; and on mowed about half that period. But the grass land once boned and kept under pasture is never so exhausted as to be as poor as it was before the application. All the better sorts of grasses—cow-grass, clover, and others—spring up in the place of the more worthless.

In Cheshire it is found most beneficial to use raw bones that have never been boiled. When bones are boiled the gelatine and other valuable properties are extracted. The raw-broke bones are richer as a manure, and their effects on the grass last much longer. These raw bones are ground by machines into a fine powder, probably the size of a pea, and in this state are strewed over the grass field. The present price of raw-broken bones is from £7 to £8 per ton.

The example set in Cheshire by its dairy farmers in using so largely bones on their grass lands, their application of bones as top dressing to grass, has been found so very beneficial as nearly to double the number of cows kept in that county; and the weight of cheese having also been nearly doubled within a few years from this boning their grass lands, ought to encourage the dairy farmers of Ayrshire to imitate this management of boning their pastures.

It might be well worth the attention of the Ayrshire Agricultural Association and other county farming societies to offer premiums to those dairy farmers who top dressed a given number of acres of their grass lands with broken raw bones. By this means the use of boning would be introduced, and great benefits result in augmenting the annual make of cheese and butter. It would also be most desirable to encourage the erection of small steam or water mills to crush the raw bones in different parts of Ayrshire. The expense of erecting one would not be great; and wherever there is a saw mill, the same wheel that drives its machinery might also drive the rollers that are employed for crushing bones. In Cheshire these bone mills are spread all over the county, and thus the farmers can easily obtain the crushed bones.

THE LEADING FEATURES OF THE IMPLEMENT DEPARTMENT OF THE ABERDEEN (HIGHLAND SOCIETY'S) SHOW.

The contrast between the show held at Aberdeen in 1847 and that of 1858, the leading features of which we now propose to glance at, must have been gratifying to all interested in the steady and healthy progress of the Highland Society. The tabulated results of the two gatherings exhibit in a marked manner the development of its capabilities of usefulness; the increase of entries of 1858, as compared with 1847, being nearly three-fold, the entries of the two years standing thus :

	1847.	1858.
Cattle.....	361	458
Horses	105	189
Sheep.....	230	590
Swine.....	24	79
Poultry	102	365
Implements and machines	49	802
Total	871	2,484

The increase in the entries of implements and machines—the department in which we are for the present specially interested—is the most marked feature of the above tables, and affords evidence of the increased and increasing practical interest taken in the department, not only by the manufacturers who invent and construct, but by the farmers who use the implements and machines exhibited. And here we deem this a fitting opportunity to point out how much of the increased value of this department of the show is due to the English manufacturers. While not for a moment endeavouring to detract from the merit of their Scotch brethren, or to lessen the praise justly due to them for their enterprise and ability; there is little doubt of the fact that the energy of the English manufacturers, and their known liberality in incurring large expenses in preparing for the shows, has done more than any thing else to raise the implement department of the Highland Society's shows from the comparative inutility and baldness of exposition, of bye-gone years, to that of the fulness and efficiency of later exhibitions. And this statement naturally brings us to the consideration of a point connected with the management of the shows which has a close bearing on the interests of the manufacturers who have mainly contributed to the success of this department. Need we say, that we allude here to the vexed question of classification of the machines and implements?—a question which, although often discussed, is so important to those immediately concerned in its speedy and satisfactory solution, that it cannot be too often broached and dwelt upon, if this will in any measure help on the agitation, which has for its object the repeal of the system now so rigidly adhered to by the authorities of the Society.

For the benefit of those of our readers who may be ignorant of the state of the question, we may here state that the implements and machines are not arranged as

at the shows of the Royal Agricultural Society of England, in groups, directly under the control and supervision of the party who exhibits them, no matter how diverse in character they may be; but they are classified according to the uses to which they are put in practice. Thus ploughs form a distinct group from sowing machines, and these again from thrashing machines, the two classes being placed at different parts of the yard. Not only this, however, but the great divisions are subdivided into sections, so that we find ploughs in reality not in one, but in many groups; to wit, "two-horse ploughs for general purposes" forming one group, "trench or deep-furrow ploughs" a second, "subsoil ploughs for two horses" a third, and so on. The same principle is carried out in sowing machines—"broadcast" forming one group, "drill sowing machines" a second, and so on; this principle of subdivision being so developed that we find the implements and machines exhibited, extended over no fewer than *eighty-two* sections. Now, if the interests of one party were those only to be consulted—namely, the *visitor* anxious to inspect the various machines exhibited, this classification would be all that is desirable, so far as the facilities it affords for making *comparative observations* are concerned; nor is its utility to the *judges* less marked and satisfactory. But the interests of the *exhibitors* are also to be consulted, and primarily so; for to them the department is altogether indebted for its practical utility: without their efforts the department of implements and machines would sink into the insignificance of the early exhibitions. The articles exhibited by them, if diverse in character, being, to suit the classification adopted, placed in different parts of the yard, obviously demands of the exhibitor one of two things—either that he go to the expense of providing one attendant or attendants at *each section* to describe to the visitors the peculiarities and prices of the machines there exhibited; or to content himself with leaving his articles to speak for themselves. Now, "either alternative," as we have elsewhere remarked, is not pleasant to be contemplated by business men, anxious to do a good business, to reimburse them for the expense of time and money which they incur in bringing their articles to the show. Nor, in fact, are the exigencies of the case provided for, by securing extra attendants; for business men know well enough that purchasers like as well to do with principals, as, on the other hand, principals like to deal at first-hand with purchasers. And many of our leading men can tell of numerous orders lost through not being able to get directly in contact with intending purchasers. It would be as impolitic in principle as it would certainly be impossible in practice, to ask the exhibitors to forego their business views in coming to the show, and to look upon it simply as a

philosophically-arranged museum, to fill up the departments of which, they send their articles. The truth is, they *show*, in order that they may *sell*; and this consideration is with them—and very fairly and justly too—the primary one. We are inclined to think that all the advantages, to the judges, of the present system of classification, may be secured with all the advantages of the system of general grouping to the exhibitors, by a compromise, the principle of which emanates, we believe, from some of the leading manufacturers, and which is simply this—The system of classification now adopted to be adhered to until the judges have made their inspection and given in their awards, which can be done before the public opening of the yard; after which, the exhibitors to be allowed to collect their articles from the various groups, and place them under their own immediate control. This principle of compromise, meeting as it does the authorities of the Society half way, should at once be acceded to; it enables them to maintain the system of classification up to that point at which it is useful for the purposes of the Society, and to discard it when it assumes an aspect of inconvenience, and brings into action influences detrimental to the interests of that class to whom the Society owes much of its attractiveness and practical utility.

In glancing at the leading features of the show, our task will be somewhat of the easiest; for to one acquainted with the recent additions to agricultural mechanism as exhibited at other shows, little novelty was displayed. Offering itself here and there only, we shall therefore adopt no classified method of presenting our readers with the results of our observation; but shall put them just as circumstances may dictate.

1. In corn-dressing apparatus, the great novelty exhibited was the machine invented by Mr. R. Hislop, Prestonpans, near Edinburgh. This apparatus received the approval of most practical men who inspected it; and in addition to the honour of being "*highly commended*" by the judges, it was considered worthy of the special mark of a silver medal. The peculiarities of its arrangement and mode of operation we now proceed to describe.

As in the ordinary fanners, the grain is cleaned in Mr. Hislop's machine by the two agencies of the "blast," which the inventor calls the "test of gravity," and by the "riddle," which he terms the "test of size." But the mode in which the grain to be cleaned is subjected to these two tests in the machine now under consideration is essentially different in principle from that displayed in the fanners of the ordinary description. For the reciprocating riddle put in motion in alternate directions by the agency of a crank, Mr. Hislop substitutes a cylindrical screen, capable of receiving a slow rotary motion. The cylindrical screen is constructed of wire cloth, and in the interior an Archimedean screw is placed, in such a manner that the grain as it passes along is forced to follow the convolution of the screw, and kept continually in contact with the wire surface of the cylinder. The diameter of the cylinder being 18 inches, and the screw taking four turns in a foot lineal, the grain is made to pass over a surface of 19 feet 4 inches for every foot of length of

cylinder. The wire cloth is kept clean on its outer surface, and the meshes open, by a brush fitted on the top of the cylinder, and stretching along its whole length. The cylinder is not composed of wire cloth of uniform mesh throughout its length, but has various lengths of different fineness of mesh. Nearest the end where the grain first enters the cylinder, the mesh is finest, sufficient only to pass inferior corn, mustard seed, and other foreign seed; the next length is of larger mesh, sufficient to pass the "grey;" while the third length is of mesh sufficiently large to pass the good corn. The various qualities of corn, seed, &c., are delivered to spouts, the orifices of which are of height sufficient from the ground to admit of sacks being placed below to be filled. All large substances—as sticks, parts of poppy heads, &c.—pass out at the further end of the cylinder.

So much for the "test of size," and the mode by which Mr. Hislop applies it in his machine. We now glance at the "test of gravity," and the method of its application. The principal feature in this department is the way in which each individual grain is subjected to the blast. This is effected by passing the grain through a valve or opening three feet six inches in width, allowing it to fall in a thin stream, not more than one grain thick, and which is subjected to the action of the blast. All the grain which stands the "test of gravity" falls directly into a trough, from which a screw or carrier removes it to the spout which passes off the "good corn." All grain which cannot stand the test of gravity is blown forward to a trough, from which a second screw or carrier removes it to the spout which passes off the "grey." By this arrangement the grain is subjected to the test of gravity, independently of and after the operation of the test of size; whereas in the ordinary fanners both are attempted to be carried out at once. Again, in Mr. Hislop's arrangement the grain is subjected to the blast in the form of a thin stream, which admits of every grain being acted upon; whereas in the ordinary fanners the grain lies in a thick stratum on the riddles, and the blast acts in a direction opposed to the passage of the good corn through the meshes, so that in great measure the blast acts counter to the very effect which it is intended to produce, and, instead of aiding the test of gravity, actually resists it by preventing the good corn from passing through the meshes of the riddle, and sends it forward to be mixed with the inferior corn, &c., &c.

From the adoption of the rotary principle, Mr. Hislop's machine absorbs comparatively little power in its working: doing the work of three fanners, it takes the power necessary to drive one only. It is capable of dressing ten quarters per hour. The machine is placed on an independent cast-iron framing; and by attaching it to a thrashing machine all the labour of re-dressing may be saved, and the two qualities of grain are found distinct and separate when the machine stops. Only one set of elevators is required to lift the grain to the revolving cylinder; all the qualities being delivered through spouts placed at such a height as to admit of sacks being placed beneath them.

2. The Britannia Reaper, introduced by Mr. Bernhard

Samuelson, of Banbury, and which is now attracting considerable attention amongst practical men. The principal novelty in this apparatus is the method by which the crop, after being cut, is collected into bundles for sheafs, the quantity contained in which is capable of easy regulation. The mechanical movements by which the raking is effected are exceedingly ingenious, and, considering the somewhat-intricate nature of the work desiderated, are not so complicated as at first might be supposed. Difficult as the task is to describe mechanism without the aid of illustrations, we shall endeavour to place such a "word-view" before our readers as will enable them to have a fair notion of the mode of operation of this ingenious "automaton reaper."

The rake has a twofold movement: first, an alternate movement of progression by which it sweeps the corn off the platform from the side at which the cutting-knives are, to that at which it is delivered, returning in the reverse direction; and, second, a movement of rotation, or part rotation, on its own axis. This second movement is required from the following circumstance: the teeth of the rake being placed vertically while sweeping off the corn from the front of the platform on which it falls after being cut, to the *side* of the machine, it follows that, if the rake made its return-journey with the teeth still vertical, the corn lying on the platform would be shoved off towards the cutters as the rake finished its return movement. To keep the teeth, therefore, out of the way of the corn, they are changed in the returning journey from the vertical to the horizontal position; the rake at the same time being raised from a low to a higher position, it passes over the corn lying on the platform. At the conclusion of the return-journey the rake falls from its high to its low point, the teeth being changed, by the part rotation of the shaft of the rake on its axis, from the horizontal to the vertical position, and so placed as to engage with or take hold of the corn, as soon as the movement of the rake in the opposite direction is commenced.

How this part-rotation of the rake is effected we now proceed to show; this will, however, necessitate a description of the movement by which the rake is made to sweep over the quadrantal platform, alternately, in opposite directions, the one movement being dependent upon the other. The curved platform (*a*), above alluded to, is described with a radius equal in length to the shaft of the rake (*b*). A cast-iron rack (*c*), curved in section with same radius as the platform, is provided with teeth at its upper and lower edges, and also at both ends, which are circular. If this rack were spread out flat it would present the appearance of a rectangular plate, with circular ends, entirely surrounded with teeth. To a lever (*d*)—which receives a reciprocating motion from side to side, through the medium of a crank, obtaining motion from the main driving wheel of the reaper—a pinion (*e*) is connected, the teeth of which engage with the teeth of the rack; with this lever (*d*) the shaft of the rake (*b*) is also connected. As the pinion (*e*) is made to work along the upper side of the curved rack (*c*) it receives a motion of rotation on its axis, the direction of which is reversed, however, as soon as it passes over the

circular end of the rack, and traverses the teeth of the underside. The pinion (*e*) has thus *two* motions each, in opposite directions, according as it traverses the under or upper side of the rack (*c*). As the pinion (*e*) passes from the upper to the under side of the rack (*c*), the lever (*d*) will fall from a high to a low position, and *vice versa*, as the pinion rises over the curved end from the under to the upper side of the rack (*c*). As the shaft of the rack (*b*) is connected with the lever (*d*), it will thus have the rise and fall to which we have formerly alluded. It is from this rise and fall of the rake shaft that the part rotation on its own axis, also already referred to, is obtained, and in this way: At its lowest position the rake-shaft is at the side of the platform nearest the cutter, and just before it commences the movement, which sweeps the corn to the side of the machine; and at its highest position when returning empty from the side of the platform. To the pinion (*e*) a vertical rack (*f*) is attached, and which rises and falls with it; with this rack a pinion (*g*), fixed on the end of the rake-shaft, engages. As the rack (*f*) falls, its movement actuates the pinion (*g*), and causes the shaft of the rake to make a quarter turn on its axis, changing the teeth from the horizontal to the vertical position. The rake then sweeps the grain to the side of the machine; and as the pinion (*e*) rises up to engage with the teeth on the upper side of the rack (*c*), the rack (*f*) also rises with it, and by its movement actuates the pinion (*g*) on the end of the shaft, and turning it a quarter round, changes the teeth from the vertical position, in which they are kept till the rake has finished its return journey, when the movements above-described are again repeated.

A peculiarity in the arrangement of the "gathering-reel," by which the standing corn is brought up to the action of the knives, is worthy of notice here, as we consider it an important improvement. We have elsewhere thus described it: "The horizontal bars of the reel, instead of being placed parallel to the shaft, are oblique to it. This places one end of the bars which strike the corn nearer the machine than the other; the consequence of which is, that they have less of the thrashing or beating influence which they possess when placed parallel to the shaft. When placed obliquely they exert at the moment of striking the corn little momentum; but as it sweeps along the oblique bars, it is brought gradually up to the action of the cutters, in a manner closely resembling the action of a man's hand, when in performing the operation, in inserting his hand at one side, he gradually brings his arm to bear upon the grain, instead of beating it directly down the whole length of his arm at once."

3. Shireff's Guano-distributing Machine. — This apparatus distributes guano in drills if required, as well as in broadcast. It resembles in general arrangements Chambers's well-known Broadcast Manure Distributor, but is of simpler character and less pretentious workmanship. The change from a broadcast to a drill distributor is effected by adjusting a series of lids or valves, so that openings in the bottom of the manure chest are left at the desired intervals. When used as a broadcast

distributor, all these lids are opened, so that the manure passes from out the chest along its whole length. The stirrer, by which the guano is made to pass out in the state of powder, and by which it is prevented from arching over and accumulating above the apertures, is a flat bar of iron provided with projecting fingers at each side, the bar having a reciprocating motion given to it, through the medium of an eccentric deriving motion from the main axle. As the manure passes through the apertures, it falls upon a revolving cylinder provided with a series of projecting studs; in connection with these the projecting fingers work of a second revolving cylinder—placed parallel to the first; so that the guano is scraped off, and falls on the ground divided or pulverized. This apparatus is manufactured by Mrs. Shireff, West Barns, Dunbar. It took the first prize.

4. In the section of "Extra Implements," Mr. Macpherson, of Carstairs, Lanarkshire, exhibited specimens of his Portable Sheep-fencing, and also the ingenious machine by which it is manufactured. The fence is a clever combination of wooden spars and tarred ropes, or zinc or galvanized wire; and so constructed as to be capable of being woven as it were in a species of loom. The tarred rope strands are four in number, and placed horizontally; the wooden spars are vertical, and are securely fastened to the horizontal ropes. Straining posts are fixed at intervals in the intended line of fence by means of loops, embracing hooks fixed in the posts. Although the fence is very light—a thousand yards weighing only two tons—it is remarkably strong, and although originally introduced for sheep, it has been found competent for the confining of cattle. It is cheap—varying from 5d. to 9d. per running yard. By using spruce branches, hazel, or oak, a remarkably neat and ornamental fence may be made. The machine is capable of working off—from the aid of a man and a boy—from 150 to 200 yards of fencing per day. The machine may be here briefly described. In a simple framework four horizontal shafts are supported in bearings and are put in simultaneous rotation through the medium of bevil wheels in a shaft worked by a small winch. Each of the horizontal shafts carries two bobbins, round which the tarred strands forming the horizontal ropes of the fence are wound. The two strands, one from each bobbin, are passed over a moveable frame in front of the machine, which performs the office of what is called the "ley" in a common loom. The two strands uniting at one point in one, form an open angle, into which the wooden spar is inserted. The handle of the machine is then turned three times round, which causes the bobbins to revolve, and, giving the strands a threefold twist, unite them into a single rope, which embraces at the same time tightly the wooden spar. As there are four sets of bobbins making four ropes, the spar is embraced at four different and equidistant points. As soon as the threefold twist is imparted to the strands, the bobbins are stopped in their revolutions, and the "ley" or frame brought forward with a jerk, which tightens the strands upon the spar. The spar, thus secured to the ropes, is pulled forward over

a roller, and a second spar inserted in the angles formed by the strands from the four bobbins; they are then twisted into one, and another spar is fastened by the action of the "ley." These operations go on till the lengths of turned strands in the bobbins are exhausted. One feature of this method of forming fencing is worthy of particular notice, namely, that on estates with abundance of home timber, the spars may be made out of timber fit for scarcely any other purpose. It is also worthy of notice that the fence is very quickly erected, two men being capable of putting up 800 or 1,000 yards per day.

Amongst the extra "implements" exhibited, was the National Coal Gas Apparatus, invented by Mr. Bower, and manufactured by J. T. B. Porter, of Lincoln. The judges "commended" this apparatus; and, as we believe that, from the simplicity of its arrangements and the economical rate at which it produces gas, it goes far to meet a want long desiderated amongst agriculturists and country gentlemen, we deem a brief description of its principal peculiarities will be useful and acceptable to the reader. The retort is not of uniform diameter throughout its length, but is larger at one end than the other, gradually widening till it is connected at its widest end with the interior of a vertical chamber (*a*), the foot of which dips into a reservoir of cold water. The smallest end of the retort is continued outwards for some distance, and is made at this part (*b*) of uniform diameter, so as to receive an Archimedian screw (*c*), which is made to revolve in it as desired, by turning a handle, connected to the spindle of the screw, which passes through a stuffing-box, made in the end flange of the retort. Near to the outer end—and externally of the retort furnace—of this cylindrical part (*b*) of the retort, and to its upper side, a vertical chamber (*d*) is fixed; this is provided with an air-tight lid, formed of a conical plug (*e*), which fits into an aperture in the lid of the chamber. The principal part of the retort is confined within a furnace, the flame, &c., of which produces the desired temperature of heat.

In working the apparatus, the plug (*e*) of the vertical chamber (*d*) is taken out, and a supply of the gas coal put into it. This falls between the two threads of the Archimedian screw (*c*) immediately beneath, and on this being turned round by the handle, the coal is delivered to the retort; the turning of the screw is continued till the whole contents of the hopper are delivered into the retort. This the "first charge" is allowed to remain one hour exposed to the heat of the furnace; the gas passing off by a "pipe" into the purifier, and from thence into the gasometer. At the expiration of this period, a second charge is provided in the vertical chamber (*d*), and is by means of the Archimedian screw (*c*) passed into the retort; this the "second charge" of course propels the "first charge" into the wider part of the retort. The "third charge" is then put in, after the expiration of another hour, which as before pushes the "first" and "second" charges further along the retort, till at last the addition of the "fourth charge" in the retort pushes out the "first charge" at the wide end of the retort, and as it descends

into the water at the foot of the chamber (a) it is cooled, and may be removed at pleasure.

By this arrangement all the nuisance met with in charging and discharging the retorts fixed on the ordinary principle, is completely obviated. All escape of gas is also prevented, and a larger product obtained from the fuel, in consequence of the vapours from the last charge which is introduced, having to pass along the mass of incandescent fuel which precedes it, as also through the whole length of the retort. Another item of saving arises from the fact that the retort or retorts are always in work. As the small coal of houses, which is too frequently wasted, is capable of being used in this appara-

tus, and as little labour is required in its management, gas can easily be made with it, costing on an average 4s. per 1,000 cubic feet. Another feature of the apparatus is the superior quality of the coke obtained. The coal from which it is obtained being subjected, at its first entrance into the retort, to a considerable degree of compression, the coke resulting is of a much denser quality than that obtained from the usual process of gas making. It is calculated that in a 60 light apparatus there will be as much coke produced as will keep the apparatus working, and the gas produced at the rate of 3s. per 1,000 cubic feet.

R. S. B.

THE SMITHFIELD CLUB FAT CATTLE SHOW.

CATTLE.

Although inflated accounts of the increased entries in the cattle classes have been spread abroad, we find the numbers of this and previous Shows are as follows:—

	1855.	1856.	1857.	1858.
Devons	17	21	32	28
Herefords	20	21	36	26
Shorthorns	40	42	43	42
Scotch, Irish, and Welsh	16	13	18	12
Other pure breeds	3	18	22	26
Cross-bred	7	12	8	23
Extra	9	13	17	14
Total	112	140	176	171

That is, as compared with last year, we have a decrease of Devons, Herefords, Shorthorns, Scotch, Irish, and Welsh, and Extra stock, the principal deficiency being with the Herefords and Irish. Other pure breeds show an increase, and the Cross-bred are three times as many as they were last year. The Shorthorns keep pretty closely to their usual force. The Show, altogether, is full as usual, without being in excess. Taken as a whole, the cattle classes cannot be ranked higher, if as high, in merit as we have known them, there being too many second-rate and third-rate animals—forming a disproportionately large back-ground, setting off the few marvels of excellence which are conspicuous in the Show. One feature, however, is more observable than ever—and this must gratify our humane and economical friends who are opposed to the pampering and bloating of beef into unwholesome fat meat, bad for graziers and butchers, good only for cooks—this is the presence of well-bred, well-fed meat, with an almost complete absence of unsightly lumps of fat on backs and rumps. In a word, it is, in this sense, the “evenest” show we have ever seen.

DEVONS.—This handsome breed musters in good force; has sent some good representatives; but is open to criticism, not being sufficiently select, particularly in the large class of “steers or oxen.” His Royal Highness’s prize steer is certainly very handsome, symmetrical, with flesh well laid on, and capital in flank and thigh. The Earl of Leicester’s second prize steer is a beautiful animal—a fine Devon in every point. Mr. Farthing’s (third prize) has a larger frame, but flesh

not so good—and quality must always carry the palm. We liked Mr. Overman’s and Mr. Fisher Hobbs’ also uncommonly well. The Prince’s ox in Class II. has a good back, is by no means deficient in beauty, but shows rather too strongly the characteristic failing rump of this breed to reach our idea of a model. We like Mr. Overman’s ox (one year older) for his splendid quality of flesh, laid on in the right places; he is really a good one in any year, and on any occasion. Mr. Farquharson’s seven-year-old ox, bred by Mr. Quartly, is a famous specimen of the sort, great in frame and substance, deep through the chest, broad, and well-proportioned. Mr. Pope’s and Mr. Senior’s heifers are exceedingly pretty. If you enjoy touching a nicely-fed animal, let your hand rest on the kindly-fleshed cow of Mr. Gibbs, which has justly won the first prize. She is nine years old, and has had six calves. Mr. Coates’, Mr. Fouracres’, and one or two others in this good class, are also meritorious.

HEREFORDS.—The excellent show of Herefords appear without their king. No amount of merit distributed through the classes being able to compensate for the absence of Mr. Naylor’s Birmingham Gold Medal ox, a beast that would of itself form a magnificent point of attraction in the yard. But the rules of the Club prevent a re-appearance on this stage. We could not but admire Mr. Heath’s splendid steer, only just victorious over Mr. Niblett’s; and Captain Peploe’s steer well deserves its commendation. The “Steers or Oxen” is an exceedingly good class, and well filled. Mr. Swinnerton is successful with his famous beast, Mr. Heath’s second-prize animal coming closely after; but with all its excellence, having a weak point where it is so often found—just behind the shoulder-blade. Mr. Aldworth’s is a very good beast, Mr. Oakley’s deserving its place of honour, and the Prince’s well worthy of its “commendation.” The Earl of Darnley’s steer is very compact and handsome, and with capital quality of meat. Mr. Shaw’s fine ox, of great size, has plenty of flesh, but with a tendency to be patchy. Mr. Turner’s very pretty Hereford heifer has her class to herself. Among the cows we find a higher degree of fatness; the class is very small; but Mr. Higgins’ cow, and Mr. Hill’s prize cow (second at Birmingham), are of con-

siderable merit. Mr. Fisher Hobbs also shows a cow by no means deficient in good quality and handsome appearance.

If the grandest Hereford of the year, or, indeed, of several late years, is absent from the Show, we have there as perfect a model of a SHORTHORN as has been lately seen, namely, Mr. Stratton's Gold Medal steer. This eminent breeder may be justly proud of his position at this Show, as not only does his steer thus far surpass all competitors, but the Gold Medal heifer bred and fed by Mr. Brown was by one of Mr. Stratton's bulls. We cannot dilate upon the various fine points of this beautiful animal, but consider him a study of what a young Shorthorn ought to be. Let the farmer who visits the Show to learn keep in memory the perfect form, the beauty of head and eye, and the rare handling and quality. The Earl of Radnor's and Mr. Joseph Stratton's steers, though comparing ineffectually with this, are exceedingly good animals. Colonel Pennant's is very great and good; and we also like Mr. Duffield's level and nice-fed steer. The Birmingham Prize Shorthorns are of course eclipsed here. Mr. Marriott's prize ox is magnificent; very level, extremely handsome, well covered with prime meat, but, as we think, by no means surpassing Mr. Wortley's famous beast of last year. The Marquis of Exeter's highly commended ox is an uncommonly good animal, remarkable for his rare thighs and good shoulder-joint; Earl Spencer's second-prize ox is bigger, very level on the back, but has not so good a round. Mr. Duffield's white ox has a capital fat back, and we notice one or two others of great merit in this fine class.

No one will grudge Mr. Brown the prize and Gold Medal for his extremely beautiful heifer, except those who may question the practice of awarding honours to an animal suffering from disease. The breeding and fattening, however, are equally meritorious, no matter that the animal may have just fallen a prey to an epidemic sure to bring down her condition. As to the award of the second prize and the high commendation, a great deal of argument has been dealt out in rather hard tones to show that the judges are wrong. Well, it is possible for good judgment to err sometimes. The Earl of Radnor's white heifer is not first-rate—there is too much of a hollow on the back, too much pinching behind the shoulder, the fore-quarters are too contracted; still it is pretty in appearance, and the quality of flesh has carried the day. Mr. Odling's heifer, which is the favourite with many people, is better formed, and very handsome; and, so important is shape over a beautiful texture of meat and kindly delicate coat, that we might have given an opposite decision had we been in office; but opinions always differ, and let exhibitors be content to abide the chances of triumph or defeat in a moderate spirit. Mr. Pertwee's heifer is fat, and certainly handsome. Is she not worthy of a commendation? or is she passed over because of her lameness? Mr. Hunt's heifer is of great frame, and has a very good back; Lord Feversham's is fine and pretty enough, but hardly so straight along the back as to please us, for symmetry.

The cows are, as usual, a very fine class. Mr. Fletcher's prize red cow is of rare merit—level, wide, compactly-made—with meat heavily laid on all over, and splendid handling. Mr. Swinnerton's second prize cow is wonderfully wide, and as good at the chine as she is at the rump, and remarkably handsome in every respect, with fine offal and beautiful head; fairly beating Mr. Barrett's admirable third-prize cow. From the rest we may single out Mr. Phillips's grand strawberry for honourable mention. Altogether the Shorthorns make a good show, without the assistance of Colonel Towneley, Mr. Wetherell, or Mr. Booth.

Popular as red tints are just now, we are not so in love with the colour as to blind ourselves to defective form beneath it; and, though a SUSSEX beast may have a good healthy red for our eye, we cannot admire a sinking behind the top of the shoulder, a narrow carcass, or rumps thinning off to a point. Now, though Mr. Cane's prize steer is really a good animal both in form and flesh, the others in this somewhat well-filled class are far from being models of perfection—too many of the backs reminding one of a house roof; and even the second prize and the commended beasts, though perhaps fair specimens of the breed, are not free from considerable defects. Mr. Dennett's prize heifer is a very good one, and well fed; Mr. Smith's second-prize cow would be also highly meritorious, were her chine and fore-quarters out enough in proportion to her broad back and hips.

In the classes for NORFOLK AND SUFFOLK POLLS we find little to admire; and the LONG-HORNS rather amuse than edify, with their narrow frames, curly coats, and preposterous horns.

Among the SCOTCH HORNED and SCOTCH POLLED cattle are some to be looked at with satisfaction; for instance, Messrs. Martin's shaggy-coated bright-dun ox; Viscount Hill's second-prize black well-formed steer; Mr. Cook's well-bred dun ox, in spite of its somewhat unlevel back; the Duke of Beaufort's handsome little yellow-coloured long-coated heifer; and Mr. Heath's Galloway ox, of great depth of frame—a particularly good animal.

Unfortunately, the IRISH BREEDS make "no entry" on the present occasion.

The WELSH BREEDS, thinly represented, are not at all remarkable, excepting that Mr. Bennett's is of extraordinarily great size, something like the antique sort, with bone as well as muscle.

The CROSS or MIXED BREED classes are of great interest and importance, as, though the perpetuation of a good first cross is a difficulty not easily overcome, the production of first-rate feeders by crossing breeds judiciously is of great and growing value. Besides, it is sometimes a matter of curiosity to find how experiments answer with the most diverse of breeds, the results of extraordinary mixtures being sometimes highly instructive if not profitable. Messrs. Martin showed a good Aberdeen and Shorthorn—Mr. Knowles a very nice thing as a steer, the produce of a Shorthorn and Scotch horned. Mr. Knowles' Shorthorn and Aberdeen heifer, red, with horns, is very well formed—straight,

deep, and uncommonly nice meat. The Duke of Beaufort's Shorthorn and Gloucester very good indeed, handsome, and with a full outspringing chine. Mr. Farquharson's Devon and Highland is a happy hit; and the Earl of Darnley has done well with a Hereford and Shorthorn cross, bred by Mr. Griffin, the character of both breeds being, however, clearly discernible. The heifer class comprises some very nice things indeed, especially Mr. Holland's beautifully fed heifer, and Mr. Druce's compact white heifer.

In the show of **EXTRA STOCK** cattle, Mr. Smith's Shorthorn strawberry cow is well worthy her silver medal; Mr. Farquharson's Devon ox is admirable; the Earl of Leicester's North Devon worthy of praise; and Mr. Oakley's Hereford ox a good beast.

SHEEP.

The number of sheep for the last three years is as under:

	1856.	1857.	1858.
Long-wools.....	40	35	37
Cross-breeds.....	18	32	32
Short-wools.....	38	62	60
Total.....	96	129	129

The **LEICESTERS** are a better show than has been previously produced. Mr. Jordan's Gold Medal wethers are extraordinarily good; Mr. Foljambe's are very beautiful animals; and we see in Mr. Hine's second-prize pen that size, combined with superiority of form and feeding quality, which makes a profitable sort. The third prize wethers of Mr. Marshall, everyone must admit, are also in splendid condition.

We have seen better sheep than are to be found in the class for "Fat wethers not exceeding 220lbs. live weight;" still there are some beautiful specimens. Mr. Bradshaw's are very handsome indeed, and have extraordinarily good backs; the Marquis of Exeter's have plenty of mutton, and a good curly staple of wool; Mr. Brooks' are very pretty animals indeed; and Lord Berners takes second-prize for a pen of long, level, well-formed sheep.

Among the **LONG-WOOLS NOT LEICESTERS**, everyone must admire Mr. Hewer's noble Cotswolds; wonderfully large and splendid sheep, with fine wool, dark faces, and capital mutton. The Extra Stock silver medal goes to Mr. Bradshaw's uncommonly good wether—wonderfully broad back, and deep through the chest; almost like a Lincoln, except for his wool. The Marquis of Exeter also shows a very good sheep in this class. The Extra Stock silver medal for a fat ewe is won by Mr. Bradshaw's ewe—no less than eighty months old, yet fine in bone, of a model form, and with a rare quality of mutton.

The important classes of **CROSS-BRED** sheep are a striking feature in the Show. Mr. Overman's prize Southdown and Leicester wethers are very perfect in form, the character of the three sheep very equal, and the handling uncommonly fine. Mr. White's, Mr. Hobbs', Mr. Howard's, Mr. Morland's, and Mr. Twitchel's are unusually good. Why do exhibitors persist in clipping so as to present a straight flat back to the eye, and rumps, flanks, plaits, bosoms apparently

full and expanded, when the hand instantly detects the falsity of the outward show, and reveals the abominable attempt to thus gloss over a defective form? And why do judges award honours to such sheep as they have done in this very class? A sheep unfairly shorn, and a pig unduly old, ought alike to be disqualified by the authorities. In the next class (for wethers not exceeding 220lbs. live weight) we must make the same complaint; and we would not give a prize to a pen of sheep, no matter how good their mutton, or how handsome their "looks," if there were such gross trimming and shaping the animals with the shears. Mr. Overman's magnificent sheep are in splendid condition, are wonderfully handsome, have rare fleeces, and are also properly shorn. Mr. Morland's are extremely compact, pretty, and with plenty of wool all over; but several pens in this class, some of them carrying off honours, are evidently the result of good breeding, feeding, and trimming combined. The Extra Stock Class is very fine. Mr. Twitchel's silver medal wether has extraordinary symmetry, great breadth of loin and chine, and full plaits; very fine in bone, and beautiful, but somewhat too tucked-up. Mr. Howard's Oxfordshire Down wether is a beauty, possessing very great merit. Mr. Overman's wether is extraordinary for size, width, and substance. Mr. Hine's Down-and-Leicester wether has considerable length of face, and a rare chine and plaits. The Earl of Leicester's wether, and Mr. White's handsome Cotswold-and-Sussex-Down ewe, are very properly "commended."

There is an extraordinary show of **SHORT-WOOLS**, the Duke of Richmond, Mr. Rigden, and Lord Walsingham at the head of the poll. His Grace's Gold Medal Southdown wethers certainly have won the honour fairly; and those of his Grace in the very grand class for sheep "not exceeding 200lbs. live weight," are scarcely inferior in merit. Lord Walsingham's beautifully-formed sheep are unsurpassed for their perfect keeping of the same character throughout; and those in the Two-shear class were worthy of a commendation, though not thus distinguished by the judges. The Earl of Leicester, the Earl of Chichester, Sir R. Throckmorton, Mr. Gurney, Mr. Marjoribanks, Mr. Overman, and Mr. Kent, exhibit some remarkably beautiful and well-fed sheep. There may be a difference of judgment as to whether the prizes in the Two-shear class might not have been given to a finer pen than that of his Grace. Beautiful as these Downs really are, the fine art of "trimming a sheep" has here also, in too many instances, been closely studied.

In the class of **SHORT-WOOLS NOT SOUTHDOWNS** Mr. King's prize West-country Downs are very great and good; Mr. Canning's Hampshires, Mr. Sharp's, and Mr. Humfrey's, exceedingly meritorious; Mr. Holland's a particularly handsome pen. But notwithstanding the very high character of the class, how is it that wool should grow so very much longer everywhere than it does on the backs and loins of the sheep. Are not sheep, if worthy of honours, good enough to show without so much "make-believe?"

In Extra Stock Mr. Rigden's silver medal wether is a

splendid animal, and Lord Walsingham's highly commended can scarcely be called inferior. The Duke of Richmond's, Mr. W. King's, and Mr. S. King's, are also remarkably good wethers. Mr. Foljambe's, too, is very handsome. Lord Walsingham's silver medal ewe we consider to be a model Southdown, first-rate in every point—of shape, quality, character, and wool. Mr. Foljambe and Mr. King show good ewes; but here too we have to complain of the exhibiting of ewes shamefully shorn, bustled, and padded and crinolined—in fact, as beauties of another genus occasionally are.

PIGS.

The number of entries are:—

1856.	1857.	1858.
38	59	57

The show of pigs is extraordinarily grand, there being not only many unusually fine animals, but the merits of almost every pen stand remarkably high. In the class of Pigs not exceeding four months old" are some marvellous specimens of early maturity and wonderful development of form and flesh—as Mr. Williams' handsome black Leicester pigs; Mr. Barber's white Middlesex pigs, very fat and beautifully fine; those of Mr. Betts and Mr. Hall, and Mr. W. Barber's are little beauties. In the next class Mr. Mill's and Mr. Crisp's deserve great praise; and Mr. Williams' little black pigs show amazing development for their age. In the class for "Pigs not exceeding twelve months old," Lord Berners is successful with a very fine pen of Yorkshire pigs; Mr. Coates's black Dorsets are uncommonly good; and Mr. Fowler's improved Bedfordshires are a valuable sort, and remarkably good specimens. The Gold Medal very properly goes to Mr. Beale's magnificent pigs in the next class—amazingly fine, handsome, and marvels of fatness, combined with incomparable quality. Those of His Royal Highness, gaining the second prize, are certainly splendid, but not at all equal in merit to the others. Mr. Betts' white improved Suffolks are wonderfully fine and symmetrical; and Mr. Crisp's improved black pigs well merit their commendation. There is an unequalled Extra Stock class. So meritorious are almost all the pigs here shown, that we ought to name every exhibitor as worthy of honourable mention. We may, however, refer more especially to the pens shown by Mr. Baker, Mr. Druce, Mr. Burrell, Mr. Crisp, Mr. Marjoribanks, Mr. Barber, Mr. Sadler, and Mr. Hall.

AWARD OF PRIZES.

C A T T L E.

JUDGES—J. Blomfield, Warham, Wells, Norfolk.
A. S. Maynard, Merton-le-Moor, Ripon.
W. Smith, West Rasen, Spital, Lincoln.

DEVONS.

STEERS, not exceeding 3 years old.

First prize, £25—H. R. H. the Prince Consort. Silver Medal to the breeder, Richard Mogridge, Molland, Southmolton. Purchased by Mr. Poxsey, Bath.
Second, £10—The Earl of Leicester, Holkham, Norfolk.
Third, £5—Robert Farthing, North Petherthorpe, Bridgewater. Purchased by Mr. Stockley, High-street, Notting-hill.
Commended—John Overman, Burnham Sutton.

STEERS or OXEN, above 3 years old.

First prize, £25—H. R. H. the Prince Consort. Silver Medal to the breeder, George Turner, Barton, Exeter. Purchased by Mr. Petherbridge, Hastings-street, Brunswick-square.

Second, £10—John Overman, Burnham Sutton, Burnham Market, Norfolk. Purchased by Mr. Jeffery, De Foubert's-place, Regent-street.

Third, £5—The Earl of Leicester. Purchased by Mr. Brooks, Stratford.

Commended—Walter Farthing, Stowey Court, Bridgewater, and William Heath, Ludham.

HEIFERS, not exceeding 4 years old.

First prize, £15, and Silver Medal as breeder—Edward I. Pope, Great Toller, Maiden Newton, Dorset. Purchased by Mr. Longman, King-street, New North-road.

Second, £5—William Senior, Hinton St. Mary, Blandford.

Cows, above 4 years old.

First prize, £20, and Silver Medal as breeder—William M. Gibbs, Bishop's Lydeard, Taunton. Purchased by Mr. Chamberlain, Exeter.

Second, £10—John Coate, Hammoon, Blandford. Purchased by Mr. T. M. Smith, Westbury, Wilts.

Third, £5—Thomas White Fouracre, Durston, Taunton. Purchased by Mr. Wm. Ponting, Stroud.

HEREFORDS.

STEERS, not exceeding 3 years old.

First prize, £25—William Heath, Ludham Hall, Norwich. Silver Medal to the breeder, the late T. Longmore, Ludlow.

Second, £10—Isaac Niblett, Conygre Farm, Filton, Bristol. Purchased by Mr. Borge, Bristol.

Third, £5—J. G. Niblett, Red Lodge, Ashley Hill, Bristol. Purchased by Mr. Ebbels, Southgate-road, De Beauvoir Town.

Commended—Captain Peplow, Gamstone, Hereford.

STEERS or OXEN, above 3 years old.

First prize, £25—Robert Swinnerton, Weddington, Nuneaton. Silver Medal to the breeder, William Child, Wigmore Grange, Leintwardine, Hereford. Purchased by Mr. W. Ponting, Stroud.

Second, £10—William Heath. Purchased by Mr. Keeble, The Lion, New Cattle Market.

Third, £5—William Aldworth, Frilford, Abingdon.

Highly commended—Richard Oakley, Lawrence End, Linton. *Commended*—H. R. H. the Prince Consort, and the Earl of Darulcy, Cobham, Gravesend.

HEIFERS, not exceeding 4 years old.

First prize, £15, and Silver Medal as breeder—Philip Turner, The Leen, Pembridge, Leominster. Purchased by Mr. Leaton, of Tring.

Second, £5—no competition.

Cows, above 4 years old.

First prize, £20, and Silver Medal as breeder—Richard Hill, Golding Hall, Shrewsbury.

Second, £10—Henry Higgin, Woolaston Grange, Lydney, Gloucester.

Third, £5—*withheld*—*want of merit*.

SHORTHORNS.

STEERS, not exceeding 3 years old.

First prize, £25, GOLD MEDAL as best Ox or Steer in any of the classes, and Silver Medal as breeder—Richard Stratton, Broad Hinton, Swindon. Purchased by Mr. Davis, Black Bull, New Cattle Market.

Second, £10—The Earl of Radnor, Colesbill, Highworth. Purchased by Mr. Mitchell, Woolwich.

Third, £5—Joseph Stratton, Manningford Bruce, Pewsey, Wilts. Purchased by Mr. Lane, Bowling-street, Westminster.

Commended—Colonel Pennant, M. P., Penrhyn, Bangor, and Charles Duffield, Marcham Park, Abingdon.

STEERS or OXEN, above 3 years old.

First prize, £25—Samuel Marriott, White House, Fletton, Peterborough. Silver Medal to the breeder, E. Griffin, West Ashby, Horncastle. Purchased by Mr. Bethell, Rochester-row, Westminster.

Second, £10—Earl Spencer, Althorp, Northampton. Purchased by Mr. C. Cooke, Northampton.

Third, £5—Thomas Swinger, Langham, Oakham. Purchased by Mr. J. Varney, Chapter-street, Westminster.

Hewer, Seven-Hampton, Highworth, Wilts (Cotswold). Purchased by Mr. Samuel Robinson, Hull.

Second, £10—Thomas West, Greenhill Farm, Bletchington, Oxford (Cotswold). Purchased by Mr. Hayhow, John's-road, Hoxton.

Third, £5—Charles Kersey, Glenstone, Ross, Hereford (Cotswold). Purchased by Mr. Portwine, Regent-street, Westminster.

LONG AND SHORT-WOOLLED CROSS-BRED,

JUDGES—J. Clayden, Littlebury, Saffron Walden.

J. S. Turner, Seaford, Lewes.

W. Watts, Littlewood, Frampton, Dorset.

FAT WETHERS, 1 year old (under 22 months).

First Prize, £15, and Silver Medal as breeder—John Overman, Burnham Sutton (Southdown and Leicester). Purchased by Mr. Freeman, Notting-hill.

Second, £10—Charles Hobbs, Maisey Hampton, Cricklade (Oxfordshire Down). Purchased by Mr. Worboys, Barnsbury-road, Islington.

Third, £5—Stewart Marjoribanks, Buahey Grove, Watford (Leicester and Hampshire). Purchased by Mr. Reecham, Clare-street, Lincoln's-inn-fields.

Highly commended—J. B. Twitchell, Wills, Northampton (Leicester and Cotswold); and John White, Parsonage Farm, Rickmansworth (Cotswold and Sussex).

FAT WETHERS, 1 year old, under 22 months, each sheep not to exceed 220 lbs. live weight.

First prize, £10, and Silver Medal as breeder—John Overman, Burnham Sutton (Southdown and Leicester). Purchased by Mr. Freeman, Notting-hill.

Second, £5—George Hine, jun., Oakley, Bedford (Leicester and Down). Purchased by Mr. Geo. Worley, Star-corner, Bernouisey.

Highly commended—G. B. Morland, Chilton, Harwell, Berks (Southdown and Cotswold).

ANY SHORT-WOOLLED BREED,

FAT WETHERS, 1 year old (under 22 months).

First prize, £20, GOLD MEDAL as best pen of short-woolled sheep, and Silver Medal as breeder—The Duke of Richmond, K.G., Goodwood, Chichester (Southdown). Purchased by Mr. King, Paddington-street.

Second, £10—Lord Walsingham, Merton Hall, Theford (Southdown). Purchased by Mr. Jeffery, Foubert's-place, Regent-street.

Third, £5—William Rigden, Hove, Brighton (Southdown). Purchased by Mr. E. Dary, Brighton.

Highly commended—Lord Leicester (Southdown).

Commended—G. S. Foljambe (Southdown).

FAT WETHERS, 1 year old (under 22 months), each sheep not to exceed 200 lbs. live weight.

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

Second, £5—William Rigden (Southdown). Purchased by Mr. J. Sharp, Brighton.

Highly commended—Lord Chichester, Stanmore Park, Lewes (Southdown).

Commended—Lord Walsingham (Southdown) and Stewart Marjoribanks (Southdown).

FAT WETHERS, 2 years old (above 22 and under 34 months).

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

Second, £10—Sir R. G. Throckmorton, Bart., Buckland, Farringdon (Southdown). Purchased by Mr. Jeffery, Foubert's-place, Regent-street.

Third, £5—John Overman, Burnham Sutton (Southdown). Purchased by Mr. Jeffery, Foubert's-place, Regent-street.

Highly commended—John Kent, Goodwood (Southdown).

SHORT-WOOLS NOT SOUTHDOWNS,

FAT WETHERS, 1 year old (under 22 months).

First prize, £15, and Silver Medal as breeder—William King, New Hayward Farm, Hungerford (West Country Down). Purchased by Mr. Jeffery, Foubert's-place, Regent-street.

Second, £10—Stephen King, Old Hayward Farm, Hungerford (West Country Down). Purchased by Mr. Smith, King's-road, Chelsea.

Third, £5—William Browne Canning, Chisleton, Swindon (Hampshire Down). Purchased by Mr. Botterell, Rochester-row, Westminster.

Highly commended—J. Sharp, Remenhorn, Henley-on-Thames (West Country Down); and William Humphrey, Oak Ash, Wantage (West County Down).

P I G S.

JUDGES—J. Clayden.

J. S. Turner.

W. Watts.

PIGS of any breed, not exceeding 4 months old.

First prize of £10, and Silver Medal as breeder—John V. Williams, Haygrove Farm, Bridgewater (Leicester). Purchased by Mr. Worsfold, King's-road, Chelsea.

Second, £5—William Mills Barber, Sunninghill Wells, Berks (Middlesex). Purchased by Mr. Dorbon, High-street, Woolwich.

Highly commended—F. Hall, Kingsbury, Middlesex (Small), and E. L. Betts, Preston Hall, Maidstone (Suffolk).

PIGS, above 4 and not exceeding 8 months old.

First prize, £10, and Silver Medal as breeder—Sir J. B. Mill, Bart., Mottisfont Abbey, Romsey, Hants (Mottisfont). Purchased by Mr. Bonny, Camberwell-gate.

Second, £5—Thomas Crisp, Butley Abbey, Wickham Market, Suffolk (Improved Black). Purchased by Mr. Pattison, Vere-street, Clare Market.

Highly commended—E. Bowly, Siddington, Cirencester (Berkshire).

Commended—J. V. Williams (Leicester).

PIGS, above 8 and not exceeding 12 months old.

First prize, £10, and Silver Medal as breeder—Lord Berners (Yorkshire). Purchased by F. C. Marshall, 26, Oxford Market.

Second £5—Francis Fowler, Henlow, Biggleswade (Bedfordshire). Purchased by Mr. Lewis Haymais, of Mile-end-road.

Highly commended—J. Coote, Hammoon, Blandford (Dorset).

Commended—G. Home, Egham (Small Black).

PIGS, above 12 and under 18 months old.

First prize, £10, GOLD MEDAL as best pen of pigs, and Silver Medal as breeder—George Beale, of Frowlesworth, near Lutterworth (Leicester). Purchased by Mr. Matther, Leicester.

Second, £5—H.R.H. the Prince Consort (Windsor). Purchased by Mr. H. Scott, Broadway, Westminster.

Highly commended—E. L. Betts, Preston Hall, Maidstone (Suffolk), J. K. Tombs, Longford, Lechlade (Berkshire).

Commended—T. Crisp (Black).

EXTRA STOCK.

Silver Medal, for the best Eest in extra stock—Henry Smith, of Drax Abbey, Selby (Shorthorn Cow).

Silver Medal for the best Long-woolled Wether Sheep in extra stock—C. J. Bradshaw (Leicester).

Silver Medal, for the best Long-woolled Ewe in extra stock—C. J. Bradshaw (Leicester).

Silver Medal, for the best Cross-bred Sheep in extra stock—J. B. Twitchell (Southdown and Leicester Wether).

Silver Medal, for the best Short-woolled Wether Sheep in extra stock—William Rigden (Southdown).

Silver Medal, for the best Short-woolled Ewe in extra stock—Lord Walsingham (Southdown).

Silver Medal, for the best Pig in extra stock—William Baker (Devon).

In the Cattle in extra stock *commended*—J. J. Farquharson (Devon Ox).

In the Cross-bred Sheep in extra stock, *highly commended*—John Overman, Burnham Sutton (Southdown and Leicester). *Commended*—George Hine, jun. (Devon and Leicester), Lord Leicester (Southdown and Leicester), Charles Howard, Biddenham, Beds (Oxfordshire Down), John White, Rickmansworth (Cotswold and Sussex).

For Short-woolled Wethers, *highly commended*—The Duke of Richmond, and Lord Walsingham (for Southdowns), and William King (for West Country Down). *Commended*—Stephen King (West Country Down).

For Short-woolled Ewes, *highly commended*—G. S. Foljambe (Southdown). *Commended*—W. King (West Country Down).

For Pigs, *highly commended*—V. J. Sadler, Bentham Calcutt, Cricklade (Berkshire), and T. Crisp (Suffolk). *Commended*—C. Burrell, Walthamstow (Essex), S. Marjoribanks (Buckingham), and W. M. Barber (Middlesex).

THE IMPLEMENT DEPARTMENT.

In consequence of the great demand for implements, lessening the labour upon our farm, every facility should be afforded to manufacturers for exhibition. The space at present allotted is not sufficient for the purpose. Most of the machines are only within reach of the eye, and many upon the floor are so cramped and wedged in amongst others as to be quite immovable. Some, again, are to be judged of only by sections and models from the sheer impossibility of finding room for them. This state of things is unsatisfactory, and especially so when the fault admits of a remedy, that must suggest itself to everybody. Surely in London, the centre of civilization, where the possible seems to have no limit, and the spirit of enterprise is perpetually urging men to the gratification of wants that are daily increasing in magnitude and grandeur—surely in London, the capital of a country that has exalted agriculture as a grand particular star amongst the sciences, we should possess a better theatre in which to display the very implements to which we are mainly indebted for our proud supremacy.

The comfort of the public and the interests of the Club would be very much consulted by the establishment of five shilling and half-crown days, as well as the one shilling days now in vogue. This arrangement would please those who could afford the extra fee, and present no hardship to such as could not.

The show itself seems a fair one, with but few new objects of especial interest. Those deserving most attention are CHILD'S GRAIN SEPARATOR, an American invention, displaying wonderful ingenuity, and a quite original principle; ALLEN'S GRASS MOWER, an American invention, brought out under the auspices of Messrs. Burgess and Key; and SAMUELSON'S REAPER, with self-acting bunching rake. These with a great number of improvements introduced in machines already known to our readers, will be consecutively detailed in our category.

First, we come to Mr. Gibbs's Stand (of Half-moon-street), and find there a splendid collection of specimens from the cereal and root crops. The mangolds are specially good, and are exhibited in very heavy weights. He fully maintains the reputation he has established, and merits the confidence he has inspired.

BIGGS shows his usual Dipping Apparatus, consisting of cradle and crane; but the cradle is now of galvanized iron.

GARRETT AND SONS show a one-horse-power, with horse-works, complete, for £32; a dressing machine; their excellent improved wheat and spring-corn horse-hoe; a turnip hoe, with good lever arrangement; a fair sample of drills, and Chambers' excellent manure distributor.

GEO. GIBBS shows a carefully-selected assortment of roots, some of the largest of which are from the farm of the Prince Consort. There are mangolds weighing from 27 to 30 lbs., and cabbages of 30 lbs. weight.

BUSBY, of Bedale, carts, with his usually strong workmanship; good ploughs, and a useful-looking horse-hoe. We were disappointed not to observe Cuthbert's reaper on his stand.

SUTTON & SON., Reading,—a famous variety of roots and seeds. The roots struck us as being very beautifully grown, and indicating specially good quality. There were some specimens of long-red and globe mangolds weighing 30 lbs. The new Chinese potato, a long tap

root, much like a badly-grown carrot, and some sugar-cane from the same country, are to be observed also.

NICHOLSON, Newark,—the haymaker, without perceptible improvement.

CLAYTON & SHUTTLEWORTH,—a fixed steam-engine.

PETER LAWSON & SON, Edinburgh,—a splendid assortment of corn seeds, grass, and roots. Many roots grown by the aid of the liquid manure drill attained the weight of 40 lbs. There was also an instrument for testing the specific gravity of roots.

DRAY and Co.—a large collection of corn mills, chaff-cutters (Richmond and Chandler), steel forks, and the celebrated prize reaper, with tipping platform, from the introduction of which into this country so many improvements have taken place in such machines.

GARDNER, of Banbury,—chaff-cutters, &c.

WHITMEE & Co., London,—an array of corn-crushers and grinding mills. A single grinder can be obtained for £2 15s.

TURNER, of Ipswich,—a double mill for crushing oats and splitting beans at one time; for hand or steam-power; simple, effective and cheap.

WARD—the famous cattle gauge, which from certain measurements determines with tolerable accuracy the weight of an animal.

JAMES, of Cheltenham,—a liquid manure distributor, which has won unto itself a good name, being very much upon the principle of the street water-carts. Upon meadows and pastures such implements are invaluable, and many a crop of swedes or mangolds might be saved by their use.

PRIEST and WOOLNAUGH—a horse-hoe, very similar to Garrett's; drills, and Rowley's blast drill.

RICHMOND and CHANDLER—very good double-action turnip cutter, made entirely of iron. In the centre of the hopper there is a wing which shuts off either side, and then the motion of the knives being reversed, the turnip is either cut for sheep or beast as desired. The price, £5 10s., for a machine so well got up, and apparently effective, is not great. The chaff machine is very much simplified, and the bearings reduced by doing away with one wheel and shaft. The workmanship of all these machines struck us as especially superior.

CLAYTON—his patent brick-dresser, so justly celebrated; together with the "Eagle" reaper, concerning which enough was said at Chester.

HOLMES and SON—a large variety of drills, corn-dressing machines, and scissor turnip-cutter, slicing a turnip at one stroke. Price £2 10s.

PAGE and TOOGOOD, Southampton,—a very creditable assortment of roots.

WARWICK SMITH, London,—a nice-tasting cattle-food, found in close proximity with a sack of locust-beans, to which it bears a great affinity. Yet the locust-beans are priced at £7 10s. per ton; run through a mill, and presented in a chopped or bruised condition, they are priced at £15 per ton; while in the shape of fine dust, they are offered for £30 per ton. This grinding seems an expensive process.

RUSTON, PROCTOR, and Co.—saw and grist mills, of very excellent workmanship.

BURGESS and KEY—Allen's patent American grass-mower; a machine which has, it appears, been tested in this country, and found to work well. A little more experience of its adaptability to varieties of crops is necessary before we can report upon it with confidence. The horses walk beside the standing grass, drawing the machine after them. The cutting arm, furnished with knives moving in the same manner as Burgess and Key's reaper, is thrown out from one side to a distance of three feet, terminated by a sort of wooden breast, which pre-

serves the grass in falling over the cutters from being deposited amongst the standing crop. This arm is firmly attached to the frame of the machine, and a spring extends from the near side of the frame to a smaller travelling wheel, which preserves the position of the whole machine, and keeps the cutting arm close to the ground, while allowing all irregularities of surface to be allowed for without the attention of the man who drives. The scheme is ingenious; but one would expect either the horse power employed to be less or the breadth of swathe greater. The price is £30. The well-known reaper belonging to this firm was also here, with screw-platform for side-delivery in swathe, and conical dividing roller. Then we have Child's patent grain separator, a machine which introduces a new principle, "weighs every kernel of grain separately," and manages to despatch 50 quarters per day, roughing, dressing, and blowing at one operation in a very perfect manner. The novelty introduced in the machine consists in the fact that the fans revolve in an enclosed drum creating a vacuum in a chamber behind. The air rushing to supply this vacuum, enters only at one point, and meeting there with the dressed grain in its final descent from the riddles, carries it up in a very surprising manner, and holds it suspended in a chamber the same width as the back of the machine. If good and true the grain undergoes the test and falls to the heap to be raked away to the bushel; but if light and chaffy, it is drawn upwards into a larger space where the current is less severe, and drops into the place allotted to it. The air then passes out behind, catching the grain as it falls from the hopper, carrying with it almost every vestige of chaff with which it is there mixed. The price of this machine is £20. We hear it is much used by maltsters and millers; and we think a simple machine without so much riddle surface might now be constructed at less expense to finish the grain as it comes in its nearly prepared condition from our combined thrashing and dressing machines. Certainly this is the most novel piece of machinery in the whole show, embodying as it does a totally new principle. There was a cheap, and what seemed to be a likely potato plough, also an American implement, as well as the celebrated American churn.

SKIRVING, Liverpool,—a very fine collection; one mangold 46 lbs. weight; the long reds splendid, and the swedes of admirable quality.

PARKES,—steel forks, two, three, four and five-tine, all additionally recommendable for the amount of work they get out of the men. The reign of iron is fast coming to a close in the matter of forks as well as elsewhere.

BARRETT AND EXALL,—a neat two-horse-engine for chaff-cutting and pulping, &c., at £105; chaff-machines, corn-crushers, and endless-band-saw.

SAMUELSON.—On this stand, in addition to his corn-mills, chaff-cutters, root-pulpers, single and double-action turnip-slicer (with the new plates to be added for mincing small for lambs), Mr. Samuelson exhibits the new American reaping-machine. The novelty consists in the automaton raker-off; not like that complicated piece of ingenious mechanism familiar to us a few years ago, but a remarkably light and simple contrivance, which effects the delivery of the cut corn in sheaf-bunches out of the track of the horses. The "cut" is five-feet wide. There is a reel, recently improved so as to have six fans instead of four. The price is £32 10s. The question is, whether the raker will perform as well on heavy crops as we hear it does on light ones?

CROSSKILL'S reaping-machine is so well known that we need only mention it as an improvement upon Bell's original, the horses walking behind, and the corn being delivered on either side at pleasure, by means of belts traversing across the slanting platform. The world-

wide known carts, and the simple Archimedian root-washer of this firm, were also exhibited.

On HORNSBY'S stand we observed a newly-patented plough, in which the usual cast-iron body is discarded, and the sole, etc., attached to wrought-iron "legs" welded to the beam. Lightness and simplicity are the result; and the plough is certainly one of considerable promise.

DRAY AND Co. exhibit the "Champion" reaper, a well-known improvement upon Hussey's machine, with tipping platform for facilitating delivery in sheaf.

BURNEY AND BELLAMY, Millwall,—a sample of their superior iron cisterns.

GREENING AND Co., Manchester,—specimens of galvanized iron-wire netting.

DAVID HART, London,—an expansive weighing-machine, with a very good reputation.

WHEELER, Oxford,—turnip-graters on Moody's principle.

CAMBRIDGE,—winnowing-machines; combined ribbed and clod-crusher rollers, which look very likely to clog; and chain-harrows, that are creating no small astonishment by the efficiency of their working, particularly in the gathering of couch-grass and freeing it from clods, &c., in their capacity to follow the drill, and to harrow short dressing on grass land.

BENTALL—his deservedly favourite root-pulpers, for steam and hand-power, chaff-machines, harrows, wooden-beam plough, cultivator, and a cheap cake-breaker.

WEDLAKE AND DENDY,—a fixed engine.

BEDFORD AND IMPEY,—root-pulpers and turnip-cutters.

THE DUBLIN AGRICULTURAL SOCIETY,—a collection that exhibits, in a wonderful degree, the great fertility of the virgin soil that is waiting to repay English capital and Irish industry.

EATON, Thrapston,—economical combined wood and iron safety jack.

WOOD, Stowmarket,—a large show of corn-crushers, chaff-cutters, and Phillips' turnip cutter.

SAWNEY, Beverley,—winnowing machines.

RANSOMES AND SIMS,—rotary turnip-cutters; in which the root is carried to the cutter, instead of the cutter to the turnip, which is the generally recognized principle. A large display of chaff-cutters, and corn-crushers, and cake-breakers, and mills of various descriptions; besides ploughs, &c.

BARNARD AND BISHOP,—root-pulpers and turnip-cutters, &c.

MARTIN, Barmer,—a Gardner's turnip-cutter, reversed, by which the roots are cut inside the barrell, instead of outside, and the last piece is professedly dealt with.

SMITH, Kettering,—a simple, effective-steerage, three-row turnip horse-hoe.

HUNT, Essex,—winnowing and seed-shelling machine.

FOWLER,—all sorts of pumps, &c.

WARNER,—double and single action pumps, fire-engines, liquid-manure distributors, &c.

LYNE, Malmsbury,—a patent field stile, of singularly ingenious construction, for footpaths in pleasure-grounds, church-roads, and foot-crossings on railways. Price £2.

SMITH AND ASHBY,—haymaker, chaff-cutters, and a natty two-horse engine. The chaff-cutters manufactured by this firm are to be recommended.

HAYWOOD, Derby,—a capital two-horse engine for £70.

PROFESSOR VARNELL,—stable fittings.

SMYTH AND SONS, Suffolk,—several corn-drills of a serviceable character.

J. AND F. HOWARD, Bedford, showed their P P iron ploughs, riding plough, lever steel-tooth horse-rake, iron zig-zag harrows, specimens of different forms of shares for various soils and purposes, a model of a patent plough with all its beautifully adapted fittings, and a very simply-constructed draught dynamometer.

KINGDON AND THROWBRIDGE,—weighing machines of a good but cheap character.

CARSON, Warminster, — Mooly's turnip-cutters, chaff-cutters, &c.

THOMPSON, Lewes,—hay-maker with double prong for reversed action.

PICKERING AND SIMS, Lancashire,—turnip-cutter, corn bruisers, and chaff-cutters, exhibiting great excellence of workmanship.

SOWDON, Gloucester,—Woofe's patent paring plough and patent litter-cutter, which, cutting straw and hay for food as well as for litter, seems a valuable machine.

HENSMAN, Leighton Buzzard,—the Bedford steering drill that merits a more extensive reputation, and a Howard's patent iron plough.

POWELL,—"Sigma's" hand-dibble and hoe.

KENT, Holborn,—a very good quick churning apparatus.

REEVES,—liquid manure drills.

PAGE, Bedford,—chaff-cutters, turnip-cutters, and an iron plough on the celebrated Bedford model.

Beneath the gallery we find the engines and thrashing machines, in their accustomed corner.

SMITH AND ASHEY,—a two-and-a-half horse-power portable engine, weighing only 1 ton. Price £70.

BROWN AND MAY,—a six-horse power portable engine. Price £190.

BARRETT, EXALL, AND ANDREWES, — a seven-horse-power portable engine. Price £210.

TUXFORD AND SONS,—a seven-horse-power portable engine, with inverted vertical cylinder inclosed within a steam-tight jacket; weight, $3\frac{1}{4}$ tons. Price £235.

WEDLAKE AND DENDY, — a seven-horse-power portable engine. Price £210.

RANSOMES AND SIMS,—a seven-horse-power portable engine; weight, 2 tons $19\frac{1}{4}$ cwt. Price £210.

HAYWOOD,—a three-horse-power portable engine; weight, 24 cwt. Price £90.

RUSTON, PROCTER, AND CO.,—an eight-horse-power portable engine, with $9\frac{3}{4}$ -inch cylinder. Price £225.

ROBEY AND CO., — a portable twelve-horse-power double-cylinder engine, with reversing gear and ashpan enclosed by water space.

E. R. AND F. TURNER,—a two-horse-power portable engine. Price £90.

GARRETT AND SONS,—a six-horse-power portable steam engine.

HUMPHRIES,—a combined thrashing and finishing dressing machine.

F. R. HUNT,—a clover and trefoil shelling machine. Price £45.

HART AND GIBBONS,—a combined thrashing and finishing-dressing machine.

HORNSBY AND SON, — a combined thrashing and finishing-dressing machine.

HOLMES AND SON,—a seed drawing or shelling and dressing machine.

CLAYTON AND SHUTTLEWORTH, — a combined thrashing and finishing-dressing machine.

STEAM CULTIVATION is represented by Mr. SMITH of Woolston's stall of "great globe" mangolds, grown on clay land, worked 14 inches deep with the steam-grubber and subsoiler, and (Mr. Smith says) without any artificial manure, and with only twelve one-horse loads of farmyard manure per acre.

Mr. FOWLER's prize steam-plough could not of course be present, but had its likeness hung upon the wall,

showing the last new method of hauling by wire-rope passing round an endless grooved drum attached by the simplest of all possible arrangements beneath a portable engine.

Mr. WILLIAMS, of Baydon, had also a model of Mr. Fowler's Chester machine, intended for engines of great power.

Mr. HALKETT showed a model elucidating his extraordinary method of cultivation by steam-machinery traversing fields upon railways laid down all over a farm with the ultra "broad gauge" of 50 feet. There were specimens, too, of different kinds of "guideway" rails, to cost from £10 to £20 per acre.

Mr. CAMBRIDGE exhibited a mahogany model of a Boydell traction-engine.

Mr. ROMAINÉ showed a beautiful model of his locomotive steam digging-machine, which works a revolving tilling-cylinder behind, either for skimming and cleaning or deep trenching land.

Mr. COLLINSON HALL, had a model illustrating his mode of working ploughs by an endless wire-rope passed in a figure of 8 form round grooved drums.

Any detailed description of these different engines and machines we must leave for some future occasion, as well as reports of their working in the neighbourhood of London during the week.

Steam-culture, however, is evidently uppermost not only in the minds of the farmers, but also in the schemings of implement makers. As you walk through the galleries, one tells you of a new plan of affixing a windlass to an engine, another gives you a peep at a new form of winding apparatus, another communicates a secret as to an altogether new kind of cultivator, and everybody is talking of experience with the steam-plough, and wondering at the convincing evidence which has lately been published.

Great things will undoubtedly flow from this year's "general muster, and throngs of chiefs" in agricultural mechanics, to inspect, consult, advise, and sow and pick up ideas. Our part as the farmer's remembrancer will be to dwell more fully as occasion serves, upon the special improvements that have been brought to light during the show.

GENERAL MEETING OF MEMBERS,

TUESDAY, DECEMBER 7TH.

Lord Berners in the Chair.

The President, Vice-Presidents, Trustees, and Honorary Secretary for the ensuing year were re-elected.

Mr. Henry Smith, of the Grove, Cropwell Butler, near Bingham, Notts., and Mr. John Ford, of Rushton, near Blandford, were elected Stewards in the room of Mr. Sanday and Mr. Foakes, retiring.

Lord Faversham was elected a Vice-President in the room of the late Lord Spencer.

On the motion of Mr. GIBLETT, it was resolved—"That a sub-committee be appointed to inquire into the practicability of procuring a better and more commodious place for the Smithfield Club to hold their annual exhibitions, and report the result of their inquiries to the next general meeting—also to consult with Mr. Bullock relative to raising the price of the admission on the first day of the show."

On the motion of Mr. Sanday, it was resolved—"That in consequence of the great additional labour incidental to the increase of the show, it is necessary that three more judges be appointed, and that the departments of each be as follows, viz. :—

Three for cattle.

Three for long-wooled sheep and pigs.

Three for short-wooled sheep and cross-bred sheep."

On the motion of Mr. Jonas Webb, it was resolved—"That in future all the pigs exhibited at the Smithfield Club's shows shall have the state of their dentition examined by a competent authority, previously to the judges making

their award; and that if the deputation shall satisfactorily indicate that the age of any of the pigs has been incorrectly returned in the certificate, the stewards shall disqualify such pig, and report their having done so to the first meeting of the members of the club, and that such disqualification shall be final and without appeal."

On the motion of Mr. BUCKLEY, it was resolved—"That there be two medals instead of one in extra stock cattle, viz., one for steers or oxen, and one for heifers or cows."

Mr. BEAZLEY'S motion—"That the rules of the Club should define what is and what is not a pure-bred animal, or how many crosses constitute a pure-bred beast, and what justifies it to be shown in the pure-bred and what in the mixed classes"—was negatived.

Mr. Badham withdrew his motion as to the admission of breeding animals and martin heifers.

Mr. Batson's motion, "That in future the ages of Herefords be calculated to the 1st of July in place of the 1st of December in each year," was negatived.

Mr. E. B. BENNETT'S motion, for increasing the prizes for Welsh and Scotch cattle, was lost.

THURSDAY, Dec. 9.

Lord BERNERS in the chair.

The following members were appointed as the Committee to carry out Mr. Giblett's motion:—

THE PRESIDENT	J. Ford	E. W. Moore
VICE-PRESIDENTS	—	R. Morgan
TRUSTEES—	W. F. Hobbs	Josh. Druce
STEWARDS—	H. Brandreth	Chas. Barnett
W. Torr	Wm. Sanday	J. Clayden
J. Quartley	J. S. Turner	O. Wallis
H. Smith	J. B. Simonds	R. Garrett, sen.
Jonas Webb	R. Milward	J. Giblett
H. Waters	A. Ransome	Brandreth Gibbs.

THE DINNER

Took place on Wednesday, at the Freemason's Tavern. The attendance was smaller than usual; not much exceeding ninety. His Grace the Duke of Richmond, the President, occupied the chair; supported by Lord Berners, Mr. C. J. Towers, (now Father of the Club), Mr. C. Barnett, Mr. R. Milward, Alderman Mechi, Mr. Henry Wilson, Mr. R. Westbrook Baker, Mr. H. Brandreth, Mr. Brandreth Gibbs (Hon. Sec.), Mr. W. F. Hobbs, Mr. G. P. Tuxford, Mr. H. Corbet, Professor Simonds, Mr. Sanday, Mr. Torr, Mr. W. Quartly, Mr. Jonas Webb, Mr. John Hudson, Mr. Druce, Mr. B. E. Barnett, Mr. Stratton, Mr. J. W. Brown, Mr. Wilmore, Mr. Watts, &c., &c.

The cloth having been removed,

The CHAIRMAN had to inform the members of the Club that Her Majesty deeply regretted that it was not in her power to visit the Show-yard this year. He thought they would all agree with him, that they had every reason to be deeply thankful to Almighty God for having placed on the throne of this country such a lady as Queen Victoria (cheers). They must be well aware that in her exalted station she had ever shown the most anxious desire to promote the welfare of all classes of her subjects; that in private society she had been a bright example to all. They had not forgot the sympathy which she manifested for our soldiers and sailors, in the late war (Hear, hear); and he believed he spoke the opinion of the great body of the agriculturists of this country—ay, and of all other classes of society—when he expressed a hope that Her Majesty might long reign over a moral and a religious people, and enjoy every blessing which this world could bestow. He would now give—"The Queen."

The toast having been most loyally responded to,

The CHAIRMAN next proposed "The Prince Consort, the Prince of Wales, and the rest of the Royal Family." He said His Royal Highness the Prince Consort visited

the Show-yard on Saturday, in consequence of the favour which was granted by the Club to the President, of allowing Her Majesty, the Prince Consort, and any members of the Royal Family to visit the Show, either before or during the period when the judges were present. The Prince Consort spent a good deal of time in going round the yard, and was very much pleased. And he (the Chairman) thought his Royal Highness would have been still more pleased if he had waited till that day, and seen his own Devon, which, he must say, was a very creditable specimen of his Royal Highness's breeding. The Prince Consort had always evinced the warmest interest in the proceedings of that Club, and had been a constant visitor to the yard; and they were much indebted to him for the support he had rendered them. The Prince of Wales had entered the army, and Prince Alfred the navy. He was himself delighted at that, because he did think that those who were hereafter to be at the top of the tree—if he might use such an expression—in this country, should see a little of the hardships of service. Prince Alfred would no doubt find it very good fun to be a midshipman on a fine day; but he would probably have to encounter some rather rough storms before he returned home. What had been done showed, at all events, that Her Majesty was anxious to devote her children to the service of their country; and, on that ground alone, it must meet with the approbation of the farmers of Great Britain.

After a fitting response had been given to this toast, the company drank that of "The Army and Navy."

The CHAIRMAN then proposed "Success to the Smithfield Club." He said he could not help congratulating the members of the club on the very flourishing state of its finances. They gave away something like £1,000 a year in premiums, the whole of which came, of course, out of their annual income; and yet at the end of the year they had money in hand. Those whom he addressed could judge quite as well as he could whether the present show was a successful one. An enormous number of visitors now attended their annual exhibitions. Many of them came from various places in Great Britain and Ireland, while others were from distant countries; and they there saw what the intelligence, perseverance, and skill of the farmers of England could do to ameliorate the stock of the country. He believed the present show was a very creditable one. There was, perhaps, an absence of such very large animals as were seen in former years—animals which were patched, as it were, with fat in various places—but, speaking generally, he might say that great attention had been paid to symmetry, which was, after all, one of the most important points in selecting an animal for fattening (Hear, hear). The example of the Smithfield Club had been very advantageous. With the aid of other agricultural bodies, that society had induced farmers in every part of Great Britain and Ireland to pay more attention to their stock than they formerly did; and he would put it to any grazier present—he would put it to any man who had anything at all to do with the pursuits in which they were engaged—whether, if a good animal would not pay sufficiently, there was the slightest chance of remuneration from a bad one? (Hear, hear.) If he wanted further proof of the great benefits conferred by the society, he might point to the fact that they had extended to many of her Majesty's colonial possessions; and he hoped that it would continue to prosper. If many of those present were unsuccessful competitors in the present show, let them not be down-hearted on that account, but let them persevere in their efforts (Hear, hear). He was happy to observe that day, in the list of successful competitors for gold medals, the names of gentlemen to whom he had never had the honour of presenting gold medals before. Let it not be supposed, however, for a moment, that he thought the young competitors ought to get all the premiums (laughter). He thought that an old stager like himself might be allowed occasionally to get some of the best premiums—that is, if he, as an old hand, could send to the show sheep that were better than those which some of the young ones sent

(laughter). He would now ask them to drink "Success to the Club;" and so long as it was maintained as it was at present, so long as it was supported by the tenant-farmers of the country, so long, no doubt, it would continue to be successful. He wished it success, not only because he was, as they all knew, a warm friend to the agricultural interest (cheers), but also because he believed in his conscience that by promoting agriculture they were doing what was best for every class of their fellow-subjects (cheers).

The toast was drunk with great enthusiasm.

The CHAIRMAN then presented the Society's gold medal to Mr. Stratton, as the exhibitor of the best steer in any of the classes, after which he proposed, and the company drank, that gentleman's health.

Mr. STRATTON, in returning thanks, said: the animal for which he had obtained the gold medal was the best that he had ever had; but he would endeavour to exhibit a better another year, feeling as he did that they ought never to imagine that they had attained perfection. There was a time when he could not win any prize; but by coming to the shows, and comparing his own animals with those of others, he had learned where the imperfections lay; and he had corrected them as well as he could.

The CHAIRMAN then presented to Mr. J. W. Brown the gold medal for the best heifer or cow in any of the classes.

This gentleman's health having been subsequently drunk. Mr. BROWN said that was the first gold medal he had had the pleasure and satisfaction of receiving, and no doubt his success would encourage others to persevere as he had done. There were several things essential to success. They must look out for good animals to begin with. He happened to live in a neighbourhood where there were great advantages in that respect. He resided in the same locality as Mr. Stratton, and he had not failed to avail himself of the facilities which were thus afforded to him for making improvements in his stock.

Lord BERNERS, in presenting to the Noble Duke in the chair the gold medal for the best pen of short-wools of all classes, observed that they all knew that his Grace did his best to fulfil any promise which he had made. Two or three years before he said that, although Mr. Rigden was the winner of the first prize in this department on that occasion, they might rely upon it that he would do his best to beat him hereafter. Like a good soldier, he had done his duty by redeeming that promise, and he (Lord Berners) had now the pleasure of proposing his health as the winner of the gold medal. (Cheers). He had also to propose his noble Lordship's health in another capacity—namely, that of Chairman. (Renewed cheers). He well knew that that toast would be received with the enthusiasm with which his Grace's name was always received, whether among the farmers of England or the farmers of Scotland; for in no place did the name of the Duke of Richmond fail to evoke a feeling of enthusiasm. (Cheers). He now proposed that the health of his Grace should be drunk with all the honours; and he knew he expressed the feeling of all present when he said they were gratified at his being able to preside that day, and fervently hoped that he would long be spared to preside over a club to which he had done so much good. (Loud cheers).

The toast was drunk with three times three.

The CHAIRMAN, who on rising was greeted with reiterated cheers, said, he could not plead that that was the first time that he had risen to return thanks at a great agricultural meeting for the enthusiastic manner in which he had been received. He had for some years been anxious for the improvement of agriculture, and he had never neglected an opportunity that was presented to him of meeting the tenant-farmers of the country; and he had often remarked on those occasions, and at other agricultural gatherings, that he thought the landowner who did not take every opportunity of meeting the tenantry lost one of the greatest pleasures a landlord could have. (Cheers). He had attended, perhaps, some hundreds of dinners; he had also attended many other meetings to which he could not now allude, and which had other objects than that of passing a pleasant evening, and he could declare that on no occasion had he ever been received otherwise than with marks of esteem, regard, and affection from every farmer with whom he had the good fortune to be

associated (cheers). He should, therefore, be ungrateful indeed if he did not endeavour to express his desire long to continue to meet them. But there were circumstances which no man could prevent. Last year was, he believed, almost the first year in which he had not been present at the annual dinner, and the cause of his absence was that he felt it to be a paramount duty to remain with the militia regiment which he commanded, and which was embodied only for a few days (Hear, hear). He felt that his presence was necessary, to prevent men from getting into scrapes, which some young men would do (laughter). He was early taught that duty was to be first, pleasure second (Hear, hear). His duty last year was to be at Dover, his pleasure would have been to meet them (cheers). He thanked the club for having re-elected him as President. He was proud of it (cheers). He was proud to have an opportunity on occasions like that of making new acquaintances among the members of the club; and at the same time, looking around, he was gratified to see so many of his old friends present that evening. So long as Providence should give him health and strength, he would always endeavour to meet them; and in the meantime, though he could not express his feelings, he hoped they would all believe that one feature of his character was, that he was not an ungrateful man (cheers).

The CHAIRMAN then presented the Gold Medal to Mr. George Beale for the best pen of pigs in any of the classes; after which that gentleman's health was drunk, and he briefly returned thanks.

Mr. C. BARNETT proposed "The Health of the Vice-Presidents and Trustees." He said, on all such occasions as that, it was their duty to acknowledge their obligations to such as filled those positions; but he regretted that his feeling in proposing this toast was not one of unmixed satisfaction. There were many absent whom he could wish to see there; and although he was aware of the value of their services, and although he knew that they wished prosperity to the society, he wished they would, by their presence, support to a greater degree the object which he knew they had at heart in accepting their offices. In proposing, however, the health of the Vice-Presidents and Trustees of the society, he was happy to be able to connect with that toast the name of his noble lord on his left, Lord Berners (cheers). They were all aware that no man connected with that Club, or with any agricultural society in England, had worked harder, or with a more honest heart, to carry out the objects which they all had in view. With such a noble Lord as that for a Vice-President, and with the Vice-Presidents and Trustees all of whom he was sorry not to see on that occasion, to co-operate with him, he was quite certain that that Club would remain permanently successful (cheers). He had also full confidence that as vacancies arose in the various offices men of the right stamp would be found to fill them.

The toast having been drunk with the honours,

Lord BERNERS, in the name of the other vice-presidents and the trustees begged to return cordial thanks for the honour which had been done them. He sympathized in the regret of Mr. Barnett that he was the only vice-president present on that occasion. He regretted it especially, because he was aware that many of his colleagues would have returned thanks in a far better manner than he could, though he was sure none of them desired more heartily to promote the interests of the club (cheers). He might, perhaps, be allowed to congratulate them on the state of their finances and the general prosperity of the club, a topic which had been already alluded to by their noble president, the Duke of Richmond. He believed that was almost the only club of the kind in existence which, instead of having anything to pay for the occupation of its showyard, received from that source a large sum of money. They obtained, he believed, £700 a-year for the privilege of holding their show in Baker-street. Many of them must recollect how they outgrew, as it were, the premises in Goswell-street. It was now very evident that they had in a similar manner outgrown the premises in Baker-street; and he thought that fact alone proved that under the presidency of the Duke of Richmond the club had prospered to an unprecedented extent, and was conferring the greatest possible benefit upon the country. He would now take that opportunity of mentioning that there was a motion on the minutes of the club to the effect that a committee had been appointed to search for a larger and more commodious place of exhibition,

a step which was required by the enormous and increasing number of cattle that were shown, the immense increase in the implements, and the vast numbers of people that now attended the show. He did not take up any of their time in enforcing the necessity for this, as no one could have gone into the show-yard that day, and especially into the department for implements, without finding it almost impossible to proceed from one place to another, or to inspect the stock or the machinery in a satisfactory manner. There was a contract with Mr. Boulnois which would last for three years; but he trusted that the committee would be able to deal with the question in a satisfactory manner, and that something would be done that would be worthy of the great show which was exhibited to London and the country at large (cheers). It now became his duty to propose as a toast "The unsuccessful candidates." He trusted that such persons would not be disappointed. They had before them the example of a man who, never having been successful before, had on that occasion obtained the highest premium in his class; and he trusted that the motto of British farmers would always be "Persevere." Thanking them on behalf of the vice-presidents and trustees, he now proposed "The unsuccessful candidates, coupled with the name of Mr. Fisher Hobbs."

The toast having been drunk,

Mr. W. F. HOBBS said, although he had attended the annual dinners of the Smithfield Club for nearly a quarter of a century he had never before been placed in the position of being called upon to return thanks for the unsuccessful candidates. For that honour he had to thank his friend on the left, the Hon. Secretary, who, with his usual diligence, had reported him as one of those who were unsuccessful (laughter), and, standing in that position, he could only say that he would take the advice given by the noble duke, and persevere. He had certainly exhibited animals this year which did not come up to the mark. They were indeed well-bred animals, but their feeding was not such as to justify him in expecting a gold medal. He hoped that in future years he should stand in a more honourable position (Hear, hear). The selection of judges in that society was a most responsible duty, and he believed that for many years past the stewards had fulfilled that duty in the best manner. He was perfectly satisfied with the decision of the judges on this occasion, and he thought every other exhibitor ought to be so too. The stewards of the club had selected as judges men of great experience, of uprightness, and of sound judgment, and he had great pleasure in proposing the health of the judges.

Mr. WATTS, in returning thanks, said: they were all well aware of the delicate ground those had to tread upon who acted in the capacity of judges, especially in days when so many exhibitors were apt to make up their minds what prizes their animals ought to receive before they got into the company of their rivals. He assured them that there was not an animal that was passed over by the judges hurriedly, and he trusted that their decision gave satisfaction to all present.

Mr. MILWARD, in proposing the health of the Stewards of the Club, had not, like Mr. Barnett, to apologize for the absence of many of those to whom the toast related. Having been a steward himself some years ago, he could testify that those who filled that office had something to do; and what had just fallen from one of the unsuccessful candidates tended to show that they fulfilled their most responsible duty of selecting judges in a proper manner. He now proposed the toast of "The Stewards," coupling with it the name of Mr. Sanday.

Mr. SANDAY, as one of the retiring stewards, said, the duty had devolved upon him of returning thanks. He could assure them that during the time that he had held office the stewards had performed their duties to the best of their ability, and, he might add, with pleasure to themselves. He thought the members of the Club might fairly congratulate each other on the present Show. Were it not for their very excellent secretary, the office of steward would be much more arduous than it was. To that gentleman they were all very much indebted, and he believed his services were generally appreciated (cheers).

Mr. TORR proposed—"The Health of the Honorary Secretary, Mr. Gibbs," and, after bearing testimony to the admirable manner in which that gentleman performed his official duties, said he was sure the committee which had just been appointed to look out for a more suitable place for the show would receive the most useful assistance from the Secretary.

Mr. GIBBS should feel ashamed of appearing before them year after year if he did not recollect that the health of executive officers was proposed with a two-fold object: first, that of expressing approval of any services which might have been rendered; and, secondly, that of affording them an opportunity of bringing before the members any subject which might appear interesting. It was, no doubt, with this view that the health of the judges and that of the stewards were proposed, and he supposed the same remark applied to his own case. He should, therefore, avail himself of that opportunity of making two or three observations. In former years these had usually been of a general character, and had related mainly to the objects and position of the Club. Observations of that character had been made on that occasion by his Grace, and therefore he should content himself with alluding to one or two of the subjects which had most recently engaged the attention of the committee. He did not presume to think that he could throw any new light on these subjects, so far as the officers were concerned; but as the majority of those present were not in the position of officers, one or two words might not be considered out of place (Hear, hear). They were aware of the great increase which had taken place in the show, from time to time, and that at the meeting held on the previous day it was, in consequence of that increase, determined that there should be three additional judges. This addition would, he believed, afford great facilities for getting through the task of making the awards; and it would be satisfactory to the judges, inasmuch as they would have more time to examine the animals. It would also tend to lighten the labours of the stewards in selecting judges, because it would be easier to find gentlemen who would undertake the duties when they were more distributed. Some new rules had been made, having reference to the ages of pigs. That might appear an unimportant subject, but he assured them that hitherto it had been one of the most difficult matters with which the stewards had to deal (Hear, hear). Often had they been kept prisoners, he might say, for several days, in consequence of having to investigate difficult cases. It had now been determined, however, that in all cases in which dentition indicated that the animals were over-age, they should be disqualified. It was satisfactory to know that through the laborious investigations of his friend, Professor Simonds, dentition had now been reduced to such a perfect science that there could be very little difficulty in arriving at correct conclusions. He (Mr. Gibbs) knew perfectly well that some years ago the pig exhibition was far less satisfactory than it was at present. Formerly one might have fancied that some of the exhibitors had taken a lesson out of Capt. Marryat's "Midshipman Easy," where a negro was represented as acting as if he thought the chief thing he ought to pay attention to was the filing of his teeth (Laughter). He did not mean that this was the case with regard to the black breeds alone; he feared that what he said was true of both black and white. The next subject which he had to mention was one which all would acknowledge to be of the greatest importance; he referred to the appointment of a committee to look for a more suitable building for the holding of the shows. No one who had traced the history of the Smithfield Club from its origin, or who had been acquainted with it even for the last few years, could doubt that the most important step that the Club ever took was the removal from Goswell-street to the present premises, and he believed that any future removal which might take place would have a most important effect either for good or evil. He would not on that occasion go through the different arguments that might be used, or compare the merits of different sites which might be offered. It might be asked why, then, he alluded to the subject at all? He had an object in doing so. He believed that "in the multitude of counsellors there is wisdom," and he would therefore ask each of them to give his mind, when he returned home, to the consideration of the subject, and if any suggestions should occur to any of them, he should be very glad if they would communicate them to him, in order that he might lay them before the committee (Hear, hear.) Whatever might be the result, he could only say that, whilst he fully acknowledged the great benefits they had derived from the removal to Baker-street, whilst he fully appreciated the vast improvements which Mr. Boulnois had from time to time made in the present show-yard, and whilst he also admitted that

gentleman's readiness on all occasions to do everything in his power to meet the requirements of the Club, no one would be more delighted than he (Mr. Gibbs) would be if they could obtain some building commensurate with the importance of the show (Cheers.)

Mr. JONAS WEBB proposed the health of Mr. Tower, the father of the Club—a toast which met with a fitting response from the company.

Mr. TOWER said he was one of the few surviving members who formed the society at the beginning of the present century, and he had been a constant member from that period down to the present time. He had been a member under circumstances far different from the present. The Club began under the auspices of some of the most illustrious men that the country could boast of at that period; but it was the misfortune of the Club to wane when agriculture became depressed; and after John, Duke of Bedford, had bestowed upon it a noble patronage for several years, he unfortunately shared in the impression which then prevailed, that it had done all that it could do in providing the production of fat stock for the supply of the London market. But there were a happy few who, first under Sir John Sinclair, and afterwards under Sir John Sebright, maintained that the Club was still necessary, who thought that agriculture was as yet only in its infancy, and that they ought not to abandon the Club, but to persevere. Happily he was one of the few who took that view, and he thanked God that he had been pleased to prolong his life to that day, to be, as it were, a living record of the noble conduct of those who had departed. The Club was at one time above £1,000 in debt, a considerable part of which was paid off by the Duke of Bedford; and by a record with which Mr. Gibbs had kindly furnished them within the last twelvemonth, he was reminded of the fact that he himself dined, not in that room, but in a much smaller room in that house, with Sir John Sebright and a very few others, who were regarded at the time as the last remains of the Club sticking to the last plank of the ship (cheers). Ultimately, however, the Club was taken up by their ex-

cellent friend Earl Spencer, who became the President. From that moment it began to flourish. With such a President, indeed, it could hardly do otherwise than flourish. Under Earl Spencer, and under the noble Duke in the chair, the number of members continued gradually to increase, and he had come to that room when he was unable to get a seat at the dinner table, and had in consequence been obliged to sound a retreat. Not only had the Club itself succeeded, but it had called into existence a number of similar societies scattered over all parts of Great Britain—societies which, like the parent one, had not only led to the production of the finest stock, but had also called forth a wonderful expansion of the mechanical powers for the development of agriculture, steam itself having at last been added to the list of inventions; and thus had the proceedings of the Society proved beneficial to the agriculture, not only of this country, but of the world (cheers).

Mr. H. WILSON proposed—"The Butchers." He congratulated the company on the remarkable address they had just heard from one of the founders of the Society—a gentleman of four-score years of age—observing that it was in entire accordance with the advice which had been given to farmers by the noble Duke in the chair. He (Mr. Wilson) considered "the Butcher" to represent at their meeting that important personage "the Consumer," and he was sure they were all glad to see such gentlemen. For his (Mr. Wilson's) own part he was especially so, as he had a pen of pigs in the Show which "the Judges" had unaccountably passed over, but that he would take this opportunity of recommending to the best attention of "the Butchers" (Laughter).

Mr. SCARLETT returned thanks.

Mr. WESTBROOK BAKER gave "The Agricultural Labourer," and the company separated at an early hour.

The speeches were interspersed with the performance of songs, glees, and duets, the musical arrangements being under the direction of Mr. Genge, who was ably assisted by Miss Pyles, Miss J. Wells, Mr. Holmes, and Mr. Ransford.

THE METROPOLITAN GREAT CHRISTMAS CATTLE MARKET.

MONDAY, December 13.—The holding of the great Christmas cattle market is an event invariably regarded in the light of no ordinary importance, and the result of the great day on the present occasion has fully answered the most sanguine expectations, not only of the public, but likewise of the owners of the stock, the former having had an opportunity of witnessing a wonderfully fine collection of animals, and the latter have realized prices which, on the whole, may be considered remunerative. At an early hour in the morning the stock was arranged for sale without inconvenience, and visitors began to arrive from nearly every part of the United Kingdom, as well as from the continent, and who expressed their admiration at the beasts and sheep offered for sale. The progress of breeding and feeding in these islands may well stand high in the estimation of foreigners, when it is considered with what comparative ease our enormous consumption is met by the agricultural body. The question generally asked by those to-day has been, "How are these things so well managed in England?" It would be out of place here to enter minutely into that question; hence we content ourselves with observing that the wants of the consumers are provided for by a judicious outlay of capital, and the aid of the most scientific principles of breeding and feeding. But when we compare the present great show with many previous years, what an important change do we observe in the bullock supply! In years gone by, we have been accustomed to witness the greater portion of the show composed of *pure* Devons, Herefords, Scots, and Shorthorns; but on the present

occasion, the supply of the latter breed was considerably in excess of all former periods, both as regards number, weight, and condition. Again, amongst the Scots fed in Norfolk and Scotland, we observed unmistakable signs of crossing with the Shorthorns, and in several other breeds the Shorthorned blood was fully apparent. But it may be said that many of the Scots were of a pure colour. Doubtless they were, and this very circumstance may have induced many experienced persons to repudiate the idea of crosses; in point of fact, the purity of the original colour may be regarded in the light of an important *secret* in the production of Scots of great weight. Now it is well known that Scots, as a breed, are a *fine* race of stock—smallness of bone and *moderate* weights being their leading characteristics; but this morning we handled more than 300 of them which averaged 220 stones each! We have nothing whatever to urge against the quality of these animals—which, in every respect, were in the finest possible condition—but this may be regarded as a strong proof of crossing with larger stock. We make these remarks without disparagement to the Devons or Herefords; our task being to note down changes as they occur; and this change leads us to the inference that the time appears to have arrived when it is found necessary to produce a more bulky description of bullock to keep pace with increasing consumption. Hitherto the efforts in this respect have been highly successful; but it occurs that, eventually, the present system will have the effect of producing a wide margin of difference between the value of Scots weighing from

90 to 110 stones and larger breeds, because we must bear in mind that every grazier cannot command success in entering upon a system which may be new to him. However, as we have remarked above, although there were fewer really pure animals shown here to-day compared with many corresponding periods, the large feeders appear to have met with an amount of success both gratifying and important; consequently it will, no doubt, be followed by a further extension of the system.

Taking the supply of Beasts in the aggregate, we should say that as great a weight of meat was brought forward as in 1857; and we may further observe that there was a peculiar evenness in the stock—a feature of no ordinary importance to the breeders. This evenness shows that even extensive crossing has not had a prejudicial effect upon either the frame or the condition of the Beasts, although we may admit that the quantity of fat has increased. This perhaps, may, not be the case with those grazed in some of the northern and midland counties, owing to the universal dryness of the past season, and the comparative scarcity of food. Notwithstanding this scarcity, the Shorthorns came to hand in prime condition, and their enormous bulk certainly excited no little surprise. Next in order we may take the Herefords, the owners of which have not, for the most part, had to contend with an absolute scarcity of food. This important breed, then, was, if anything, superior to last season in every respect, although some of the Beasts had evidently been crossed. Their age was a full average one, and they shewed no signs of rapid or over-feeding. We now come to the Devons. Smallness of bone and medium weights were their leading features; as such, they stood high in the estimation of those who cater for the West-end, consequently realized high prices. The show of Scots was a magnificent one, and not a few of that splendid breed were as heavy as some of their more stately neighbours. From Sussex, the arrivals were in excess both of 1856 and 1857, and not a few of the Oxen were seven and even eight years old. There were very few Welsh runts on offer, and this breed is evidently falling off in number. A few of the Heifers from Ireland were in good order; but the supply in this respect was not what may be termed a fine one. As might be expected, very few foreign Beasts were brought forward, and their condition was very middling. A few Longhorns and several mixed breeds were on sale, but they afford no scope for comment.

The following return shows the number of beasts exhibited, and the prices obtained for them, on the great days in the last eighteen years:

Year.	Beasts Shown.	Prices.			
		s.	d.	s.	d.
1840	3,528	4	4	5	8
1841	4,509	3	8	5	0
1842	4,541	3	4	4	8
1843	4,510	2	8	4	4
1844	5,713	4	0	4	6
1845	5,326	3	6	4	8
1846	5,470	4	0	5	8
1847	4,232	3	4	4	8
1848	5,942	3	4	4	8
1849	5,765	3	4	4	6
1850	6,341	3	0	3	10
1851	6,103	2	8	4	2
1852	6,271	2	8	4	0
1853	7,037	3	2	4	10
1854	6,181	3	6	5	4
1855	7,000	3	8	4	2
1856	6,748	3	4	5	0
1857	6,856	3	4	4	8

The total imports of foreign stock into London last week amounted to 4,323 head. In the corresponding

week in 1857 we received 1,773; in 1856, 1,622; in 1855, 4,752; in 1854, 3,999; in 1853, 6,316; and in 1852, 4,436 head.

IMPORTS INTO LONDON LAST WEEK.

FROM WHENCE.	BEASTS.	SHEEP.	LAMBS.	CALVES.	PIGS.
Rotterdam....	163	1603	—	208	—
Hambro'.....	—	68	—	—	—
Harlingen	91	425	—	12	3
Medemblik ..	56	1635	—	3	—
Ostend	—	50	—	6	—
Total	310	3781	—	229	3

The yearly comparison of weekly imports is as follows:

	BEASTS.	SHEEP.	LAMBS.	CALVES.	PIGS.
1857....	259	1361	—	155	—
1856....	499	919	—	204	—
1855....	859	3555	—	238	—
1854....	1130	2593	—	269	7
1853....	1136	4693	—	462	20
1852....	235	3782	—	419	—

STATE OF THE TRADE.

The attendance of both town and country butchers was very large, and, notwithstanding the unfavourable change in the weather, there was a fair, but by no means active, demand for all good and prime Beasts, at fully last Monday's currency. The general top figure for Scots was 5s., but a few very superior animals realized 5s. 2d. per 8lbs.; inferior Beasts were a dull sale, but not cheaper.

The supplies from Herefordshire, Devonshire, Somersetshire, and Warwickshire amounted to 2,300; from Lincolnshire and other adjacent counties, 1,500; from Norfolk, 420; from other parts of England, 950; from Scotland, 700; and from Ireland, 400 head.

On the stand of Mr. Robert Morgan there was a remarkably fine show of Beasts from various counties. The stock from Scotland comprised some wonderful animals, fed by Messrs. Peter Milne, Mitchell, Cooper, Tate, Kidd, and Stodart; from Norfolk, Beasts bred by Messrs. Robert Gillett, Leeds, Abbott, Feltow, Freeman, and Hayne. From the midland counties the supply was large, and it comprised stock forwarded by Messrs. Allday, Hewson, and Bird. The Prince Consort, also, sent some stock to Mr. Morgan's stand; likewise Mr. Joseph Raddock, of Berwick-on-Tweed.

Mr. D. Maidwell offered for sale 20 very fine Scots belonging to Mr. MacCombie, of Tillyfour, N. B.; some prime animals, the property of Mr. J. Reed, of Aberdeenshire, and of Mr. Sherringham, of Sculthorpe, Norfolk.

Mr. Thomas Burrell showed 10 very fine Herefords belonging to Lord Darnley, and 20 Sussex Oxen fed by Mr. C. Burrell, of Walthamstow.

Mr. Thomas Duckwood had 20 very prime Scots, the property of Mr. G. Hay, of Aberdeen; likewise, some fine beasts forwarded by Mr. Heath, of Ludham Hall, Norfolk.

Mr. Giblett exhibited some very prime stock, the property of Messrs. Stewart, Martin, Knowles, and Mennie, of Aberdeen.

Mr. Underwood had a fine collection of animals fed by Mr. Curtis, of Landport, Northamptonshire.

Messrs. Brooker and Son had 27 wonderful Sussex Beasts, and various other prime lots from that county, including some Oxen sent by General Ellice.

Mr. Lamb exhibited very prime Scots and short-horns—the former being forwarded by Mr. Postell, the latter by Mr. Waters, of Norfolk. Some of the Cattle were of great weight.

Mr. Collins exhibited prime stock belonging to Mr. Whitworth and Mr. E. Groves, of Newport Pagnell; W. Beardsly, Esq., of Leicestershire; Mr. R. Thomas,

Shrewsbury; John Hudson, Esq., of Castleacre; Mr. Overman, of Norfolk; and Mr. Marden, Aberdeenshire.

Mr. Wm. Vorley had stock of very fine quality forwarded by Mr. Hutcheson, of Aberdeen; also by Mr. George Philip, of Inverary, and Mr. Yorke, of Thorpstone.

Mr. Thomas Dixon had some fine breeds belonging to the Marquis of Exeter, Messrs. Little, Walsham, Taylor (Long Sutton), Shelton, Marshall (Aylesbury), and Mr. J. Rippin.

Mr. Senior, of Broughton House, near Aylesbury, had on offer 40 very prime Devons.

The above comprised the leading and best portions of the supply of Beasts.

There was a full average supply of Sheep for the time of year, and their general quality was good. Prime Downs and half-breeds moved off steadily at full quotations, the top figure being 5s. per 8lbs., whilst most other breeds may be considered steady, on former terms.

Messrs. Weale showed 20 very prime Downs, belonging to R. Oakley, Esq., of Luton; 10 from Mr. White, of Rickmansworth; 50 from Mr. W. Bates, of Harpenden; 80 Gloucesters from R. Rowlands, Esq., of Cresslow, and various lots from Bedfordshire and Berkshire. Mr. Gurrier had a fine collection of Cotswolds, together with some fine Sheep sent by Lord Radnor and Sir R. Throckmorton. Some of the Cotswolds sold at £5 10s. each.

Some unusually prime Downs were sold by Mr. Lintott, the property of His Grace the Duke of Richmond, and of Mr. Sanders, of Watercomb, Dorset.

Mr. Lathbury exhibited Hampshire Downs of great weight, bred by Mr. King, of New Hayward, Hereford, and Mr. Humphrey, of Chaddleworth, Berks. Mr. W. Collins had a very good supply of Sheep.

The were seven West Country Downs, of splendid

weight, disposed of by Messrs. Still and Son. They were fed by A. Darby, Esq., of Stoke, near Windsor.

There were some remarkably fine Down Lambs on sale.

The finest specimens of the Lincolnshire long-wooled Sheep, direct from that county, were exhibited on the stands of Messrs R. Eland and Son, Hancock, Woodward, Mawer, and Smith. They numbered about 180, and were fed by Marshall Heanley, Esq., R. G. Chatterton, Esq., Messrs. Byron, Everington, Parker, Seals, Everard, Wilkinson, and others.

The supply of Calves was good, and the Veal trade ruled steady, at full prices.

There was a moderate demand for Pigs, at extreme rates.

A STATEMENT AND COMPARISON OF THE SUPPLIES AND PRICES OF FAT STOCK EXHIBITED AND SOLD IN THE GREAT METROPOLITAN CATTLE MARKET ON THE GREAT DAYS IN 1857 AND 1858.

Per 8lbs. to sink the offal.	1857.		1858.	
	s. d.	s. d.	s. d.	s. d.
Coarse and inferior Beasts	3 4 to 3 6	...	3 4 to 3 8	...
Second quality do.....	3 3	4 0	3 10	4 2
Prime large Oxen.....	4 2	4 4	4 4	4 8
Prime Scots, &c.....	4 6	4 8	4 10	5 0
Coarse and inferior Sheep	3 2	3 8	3 4	3 8
Second quality do.....	3 10	4 0	3 10	4 4
Prime coarse-woolled do..	4 2	4 10	4 4	4 6
Prime Southdown do.....	5 0	5 4	4 8	5 0
Large coarse Calves ...	4 4	5 0	3 8	4 4
Prime small do.....	5 2	5 6	4 6	5 0
Large Hogs.....	4 0	4 6	2 10	3 4
Neats small Porkers.....	4 8	5 2	3 6	4 2

SUPPLIES ON SALE	Dec. 14, 1857.		Dec. 13, 1858.	
	Beasts.....	6,856	6,424	
Sheep.....	18,450	23,200		
Calves.....	69	115		
Pigs.....	330	350		

THE SMITHFIELD SHOW WEEK.

You may generally trace the changes in a man's fortunes from his change of habitation. The biographer is especially fond of noting such land-marks in the history of his hero, whether it be from the humble cottage of future greatness, or to "the worst Inn's worst room" of fallen splendour. Let us at such a season follow out the more pleasing picture of the two. Let us take the industrious apprentice who has begun life by bringing his Bessy home to quiet lodgings. But the family soon increases, his means rise with it, and in a few years they have far more comfortable quarters. They are good tenants, too, and the landlord does all he can to keep them—builds out a drawing-room, enlarges the offices, and adds every improvement that the premises are capable of. His efforts, however, are of little avail. The family is large and thriving, and they have crowds of visitors coming to see them. Indeed, after the crush of last Christmas, Bessy, now a buxom matron, will put up with it no longer. They must have a bigger house, a better place to welcome their friends, and where they may really enjoy themselves. To be sure, buying a mansion in a good part of town would be very expensive, and building one even worse. Paterfamilias quickly sees what she is hinting at, and the suburban villa is eventually decided upon. A place with plenty of room for their visitors to

stroll about and see everything worth seeing—the fat pigs, the shorthorn cows, the girls' poultry and pigeons, and so on. And, when they are tired of these, there are plenty of nicknacks to amuse them in-doors, with, of course, a good lunch or dinner ready to be served before they leave for town again.

The Smithfield Club is the industrious apprentice, or rather, just now, portly Paterfamilias, in the very zenith of his prosperity. We hear him often boast, with pardonable pride, how he started in life with those humble lodgings in Goswell-street. Then, as he found he could afford it, he removed his people to a far better house in King-street, Portman-square, where he has been very comfortable, and where the landlord has certainly done all he could to make him so. But his family is still increasing; and as for his friends, it would be quite absurd to attempt to entertain them here much longer. They can only push, and jostle, and tread on each other's toes, without half enjoying the good things he has provided for them. Something must be done; and he straightway declares that he is on the look-out for a bigger place. Many of his acquaintance advise him to build, and have a house all his own. Our friend, however, is a tolerably cautious man, with all his ambition. He has heard what a costly business building in London really is, and

he knows a man in the same profession as himself in Birmingham, who, a few years since, fairly overbuilt himself, and who could never have gone on without the assistance of his friends and neighbours. Still he would like to have at least as good a home as his country-cousin, and as he wants it for the winter rather than the summer months, there might surely be something found to suit him. It is whispered, indeed, there is a very fine place—quite a Palace in fact—in the neighbourhood of Sydenham, that would be just “the thing” for him. It is almost empty at the time of year he would want it, and has nearly every convenience ready-made that he would require. Partial as he is to mechanics, he might have all his machinery admirably arranged in the house itself, while his well fed stock and famous pigs would have ample space provided for them in the homestead. The people now here have some little fancy for poultry, and he might well add this to the other inducements for his friends to come down to see him. Then there are capital luncheon and dining-rooms, a railway running right up to the door, and as fine a look-out as anyone could wish to have.

It really promises to be a very fine look-out for the Smithfield Club, if the place could only be taken upon a fair agreement. At any rate, we would advise Mr. Giblett's Committee not to pass over too hastily such a site, merely from its distance from town, which is actually not now further from London Bridge or Fleet-street—from Belgravia or Battersea—than the Bazaar itself. There might not possibly be so large an attendance in the evenings; but with all its concomitant attractions, the Christmas Show at the Crystal Palace would be sure to draw immensely, especially if the Poultry Show were associated with it. Moreover, it would be the very spot upon which to inaugurate a five-shilling day.

This was, as we have made it, the chief topic of the week. And no wonder either, for the Bazaar was more crowded and more inconvenient than ever. In fact, as Mr. Jonas Webb said at the Farmers' Club Dinner, if a man wishes to see the Show in anything like comfort he must become a member of the Smithfield Club, and so avail himself of the privilege to spend his two hours at the private view. This opportunity was offered for the second time on Monday last, when we found the entries numerically about as good as ever; but many of the classes by no means equal to the average excellence of the few past seasons. Neither of the three established breeds—Shorthorns, Devons, nor Herefords—were what we have seen them. The Devons especially were palpably below the promise they have shown; and while there were a few fair Herefords, there was nothing extraordinary amongst them. The best—Mr. Swinnerton's ox, far from a perfect animal—was only a middling second in his class at Birmingham. In the Hereford cows, again, there was often little merit or no competition. The Shorthorns and the Crosses had a long way the best of the meeting. In fact, the two selected, Mr. Stratton's steer and Mr. Brown's heifer, were the only GOLD MEDAL animals in the yard. They are both by bulls of Mr. Stratton's, the heifer

by Waterloo, and the steer by a son of Booth's Harbinger. People have occasionally said, in times past, Mr. Stratton did not go enough for “blood;” but we should think they would be satisfied now. A very model in shape, his steer showed every sign of high breeding, and we rather regret his not being kept on for another year. There was every promise of his developing into a really grand beast. The Birmingham awards over the Durhams were anything but confirmed in London. For instance, Mr. Swinnerton's Gold-medal cow was beaten here by two that were shown against her the previous week—Mr. Fletcher's cow, which stood before her in her own class, and Mr. Brown's heifer, declared to be superior to either. We believe, however, there was not a Shorthorn-man in office at the Midland Counties' Meeting, and that quality was, accordingly, not sufficiently regarded. We certainly, so far, go with the Smithfield Club dicta. A full report of the merits of the Show will be found in another part of our paper, and we need not repeat ourselves here. The sheep and pig entries, however, made up for any falling off amongst the cattle. The Yorkshire Leicesters were declared to be the best ever sent up, and never certainly were there handsomer sheep than the Duke's Downs. Another resolution of the Club, passed during the week, is, that pigs found to be over the age stated shall be disqualified—a rule that should surely have been in practice already. There was one rather remarkable case of this kind in the present exhibition. The Yorkshire pigs, selected by the judges for the chief prize, were at first thought to be over the age stated in the entry—ten months and five days—and the award was not published in the official prize-list. But, as it subsequently appeared they were still under the twelve months' limit, the premium was given them, although under the new regulation it could not now be so settled. They were certainly wonderful for their age. At Birmingham Mr. Simonds decidedly condemned pigs for being “of greater age than that described in the owner's certificate.”

The other resolutions agreed to will be found in the report of what passed at the two meetings of Members on Tuesday and Thursday. The Dinner on the intervening day was not so well attended as of late, nor were the proceedings marked by anything very novel or strange. Care must be taken to introduce as much new blood as possible into the executive, and we may then have more fresh faces here. The high table again ran in its well accustomed line of long tried supporters—Lord Berners, Mr. Barnett, Mr. Milward, Mr. Brandreth, and Mr. Hobbs. The Farmers' Club dinner, on the Tuesday, went off with more spirit. In fact, this Club is coming to be cited as a bit of an example: and at the General Meeting of the Royal Agricultural Society on Friday Mr. Sidney, in a speech commendable for its moderation of tone, referred to the Club as an instance of how the farmers themselves might be induced to take an active interest in any proceedings affecting them. The Society's Report has more in it than usual, and may be read with advantage.

It anticipated, indeed, in a great degree, the objections and suggestions offered.

The very able and unusually lengthy paper read by Mr. Bond at the Farmers' Club, occupied more than an hour in reading. Another long evening was spent at the Society of Arts over Mr. Halkett's Essay on Steam Cultivation. Surely, by another year the Agricultural Committee of that august body may have weight enough to alter the time of meeting to an open day.

Might we add one word more, and express a hope that the official prize-list may yet be amended. A highly-commended cow in one of the classes was thought by many to be superior to the second prize. Now

every paper will give all due honour to the second prize; but scarcely one will name the highly commended, simply because she is not named by the Club. In a somewhat confused state, at the end of the list come a lot of commendations — that is, "Highly commended, 45;" "Commended, 41" — which not one man in a thousand will care to unravel. It must not be supposed that our list is a mere copy of that issued by the Club. We have taken the trouble to discover and to identify what "45" is, and what "41." Generally excellent as are the management and arrangements of the meeting, we are the more emboldened to press this point upon the attention of those in authority.

THE CONSUMPTION OF BUTCHERS' MEAT IN LONDON.

The return of the annual Christmas meeting of the Smithfield Club Cattle Show, with its prime selection of fatted animals, naturally enough brings forth with it suggestions of the aggregate consumption of butchers' meat in the metropolis. It may, therefore, be useful and interesting to connect with the records of prizes and descriptions of superior animals exhibited, the proportion of food they furnish to the millions, and the statistical details of supply and consumption. Unfortunately our details are not very complete for any such estimate, because the dead-meat sales have been trenching so largely of late years upon the live stock sales, that we are much at fault for authentic data for computation. While we have complete returns for a long series of years of the sales of beasts and live stock generally in the metropolitan markets, there are no returns to guide us as to the quantity of dead meat sent to London and sold in Newgate, Leadenhall, and other markets.

It cannot fail, however, to be remarked that the sale of cattle and sheep unslaughtered have by no means kept pace with the increase of population and wealth in the metropolis, and with the consequent necessary demand for meat. Let us examine this matter in a statistical point of view, and compare the figures at decennial periods.

Firstly, then, how has the metropolitan population progressed? It stands as follows:—

1821	....	1,378,947
1831	....	1,654,994
1841	....	1,948,417
1851	....	2,362,236
1858	....	2,750,000

We assume the population of London at the present time to be fully two millions and three-quarters, for the Registrar-General estimates it will reach 3,000,000 before 1863.

Now, what are, next, the returns of cattle sold in the metropolitan market, at the corresponding periods, to

supply the food consumption of the people of the metropolis? They have been as follows:—

Year.	Cattle.	Sheep.
1821	.... 129,125	.... 1,107,230
1831	.... 148,168	.... 1,189,010
1841	.... 166,922	.... 1,310,220
1851	.... 229,717	.... 1,572,400
1857	.... 272,843	.... 1,391,960

The returns for 1858 are scarcely yet complete.

Here, then, we have the remarkable fact that the sale of live cattle has only doubled in the period under review, while the sheep have scarcely increased at all, and have kept almost stationary in the last sixteen years. And yet we know that the condition of the mass of the people, from the highest to the lowest classes, has greatly improved in the thirty or forty years under review. It is therefore self-evident that the dead meat must form a much larger proportion of the business than it formerly did; and it would be interesting if we could arrive at a correct estimate of the quantity brought to London by the different railways.

Among the fluctuations of other large articles of food-consumption it is remarkable to find how uniform and steady the supply and sale of live cattle are in the metropolis. The annual sale of sheep has stood, with comparatively slight variation, at 1,400,000 for the past twenty years. The cattle sales stood at about 170,000 to 180,000 from 1835 to 1844; but since that period have gradually crept up to 221,000 in 1847, and 272,000 head for the last three years.

There is no doubt the weight of the animals has much increased of late years as compared with the first period of our inquiry. In 1830 the average dead weight of the bullock was about 656 lbs., of the calf 144 lbs., of the sheep and lamb 90 lbs., and of the pig 96 lbs., nearly double the weight of those animals at the close of the last century. But now we might take, if not as an average, at least as fair and ordinary samples, the bullock at 900 lbs., the calf at 150 lbs., the sheep at 90 lbs., the lamb at 45 lbs., and the pig at 160 lbs.

A mere estimate of the meat consumption of the metropolis by the quantity of live stock sold, would be a very erroneous and unsafe criterion; but it may be worth while, nevertheless, to compare the present and past metropolitan consumption by this test. In 1836, the sales in Smithfield Market would give the following proportions:—

	Average weight.	Total weight.
	lbs.	lbs.
Cattle	159,907	656
Sheep and lambs	1,287,070	90
Pigs	254,672	96
Calves	22,500	144
		<hr/>
Pounds of meat consumed		248,423,804

Now, if we divide this gross number of pounds by the population at that period (say 1,800,000), the quotient will be 138lbs. for each person per annum. But it should be borne in mind that this includes the bones and offal. If we next take the present supply, and calculate upon similar data, we have the following figures:—

CATTLE SOLD IN 1857.

		Average weight.	Total weight.
		lbs.	lbs.
Beasts	272,843	900	247,558,700
Calves	29,706	150	4,455,900
Sheep	1,391,060	90	125,276,400
Pigs	25,030	160	4,004,800
			<hr/>
			379,295,800

Dividing this gross amount again by the actual population, it gives only a proportionate allowance of 101lbs. per head. It is thus far quite clear, as was shown in our columns three or four years ago, that the carcase trade is fast superseding the live stock sales in the metropolis. The farmers and stock-breeders have found out that there is a better demand for the fore-quarters and offal in the provinces than in London; and moreover, that there is a considerable loss in the expense and trouble of transport of live stock, and the waste on the animal system, and the uncertain mode of sale by lump, as compared with the actual weight of dead meat.

THE SMITHFIELD CLUB CATTLE SHOW.

DEAR SIR,—The annual return of the above festival (for such I consider it) is an event that cannot fail to interest every one who has the improvement of agriculture and the advancement of the country in material prosperity at heart. This interest has been greatly heightened and extended since the acknowledgment of the relationship between the cultivation of the soil and the physical sciences has been made by men whose pursuits in other respects might be supposed to be inimical to those of agriculture, but who now recognise it as at least equal in importance to any of the industrial interests of the country; and this consideration has imparted an impetus to the practice of husbandry amongst a class who formerly had little to do with the land, except to receive the rent, but who now take a real and personal share in the profession itself. It would be lowering to the character of agriculture to say that it has become *fashionable* with this class. Their accession to the cause as practical men has arisen from a principle far more correct and permanent than the mere frivolities of a passing fancy; it is rather instigated by a deep-seated conviction of the vast importance of the subject in a country like England, where all the different industrial employments of the people depend in a great measure for their success on the price and abundance of the first necessities of life. It is to men of the last generation that we are indebted for this high and permanent standing that agriculture has taken amongst the great interests of the country, and which has raised it to that pitch of excellence we now behold. Gathering around them men of eminence in science, art, and general intelligence, they encouraged and promoted those investigations into the once-mysterious arena of animal and vegetable life, which are now bearing such splendid fruits, and the results of which have been exhibited at Baker-street during the past week.

It is satisfactory to see, by the manner in which the character of the Smithfield Club Cattle Show is sustained this year, that the recurrence of a low price of wheat has not in any degree damped the spirit of the English

farmers, or induced them to relax in the path of improvement and competition. This is as it should be; for assuredly the passing cloud under which the agriculturists are now suffering should produce anything rather than a resolve to relax in their efforts to carry out the great measures of improvement in the cultivation of the soil now in progress. Far from any falling off in the quality of the various animal and vegetable productions exhibited at the late show, there is, if anything, a higher degree of perfection in most of the specimens. Amongst the cattle I thought there were fewer inferior or cross-made animals than usual. The show of Devons and Shorthorns was good; and many of those which were not considered equal to the prize cattle, did infinite credit to both breeders and feeders. Indeed, it appeared to me that the several breeds were, on the whole, quite as well sustained in their distinctive characteristics this year as last, and that there was a greater equality of excellence, and consequently less superiority. There were some splendid specimens of Herefords and Sussex; but I confess I am not very partial to the long-horned breeds, probably owing to early associations.

Amongst the sheep, there were some specimens of Southdowns equal to any I ever beheld. Those of the Duke of Richmond (Nos. 241 and 263) were perfect models, and displayed as high breeding as I can conceive possible to be produced. Lord Walsingham, W. Rigden, G. S. Foljambé, and many other of the old exhibitors, fully sustained their previous character. I missed Overman, of Weasenham, and therefore conclude that, having sold off his whole stock of Southdowns, he has left the field to other competitors, being satisfied with the substantial honours he has heretofore obtained. The stock, however, exhibited by his relative from Burnham, Mr. How, did ample credit to the reputation which that farm has enjoyed for more than half a century, under the management of his progenitors, as flockmasters. Of West-country and Hampshire Downs, I fancied the show was inferior in number, if not in

quality, to that of last year. Those, however, exhibited by Mr. King (272 and 274) were certainly splendid sheep. Of the longwooled breeds there were many meritorious lots, but the Cotswold did not strike me as equal to those of last year. Possibly the dryness of the season may have had something to do with the condition of the larger sheep, which require a more abundant pasture than the Southdowns. In symmetry, however, there was no falling off in any of the various breeds; and this is of far more importance than the condition of the animals, being a proof that the attention of the breeders has not relaxed.

Of the pigs I believe there was but one opinion, that they were quite equal to any previous exhibition. The enormous disproportion, it is true, between the age and the size and weight of some of the animals, led some critical farmers to doubt the truth of the announcements upon the cards. Thus lot No. 325 states the age of the pigs at 10 months and 5 days, whilst the weight was estimated by a butcher, whom I questioned on the subject, at 25 score each, or 35 stone 10lbs. long weight. It is not likely, however, that Lord Berner's herd should have any motive for deceiving his lordship as to the age of the pigs, but certainly it appears a marvellous thing for a pig to gain $3\frac{1}{2}$ stone per month the first ten months of its existence. Almost as wonderful was lot 333, the three pigs of which were estimated at 30 score, or 42 st. 12lbs. each, their age being 17 months, which allows $2\frac{1}{2}$ stone per month. I cannot, however, agree in the propriety of thus laying on *fat*, whilst it is manifest the flesh cannot grow in proportion, although I am not exactly of opinion with the Irishman who fed his pig only every other day in order to have a streak of fat and a streak of lean alternately, which he considered the perfection of good pork. If we are to judge of the taste of the visitors by the attention they paid to particular portions of the Exhibition, then I should conclude that the show of pigs was the favourite part of it, for it seemed almost impossible to get near some of the lots, so great was the curiosity the grunTERS excited; and great also was the anger, expressed in harsh and querulous notes, excited by the attempts of the company to make them exhibit their proportions by rising from the recumbent position in which their swinESHIPS seemed so much to delight.

The show of roots and other vegetable productions was very fine. Those sent over by the Royal Irish Agricultural

Society were of enormous size; some of the cabbages being almost monsters. They could not weigh less than from 35 to 40 lbs. The mangel wurzels, too, were of gigantic proportions; but Ireland is *par excellence* the country of roots, and I have known as much as 70 tons of mangels per acre grown in the neighbourhood of Dublin. Mr. Smith exhibited some very large specimens, the result of his steam-ploughing (as he avers), which enabled him to stir the land to a depth not attainable by any common plough. There were some fine specimens of the Sorgho plant grown by Mr. J. W. Clark, of Whittlesea. The produce of his crop he estimated at 120 tons per acre (green), which is enormous. I expect that this plant will receive considerable attention in future in this country, as it has already done in France. It is not difficult of cultivation if put in *late* enough to escape the frosts of spring.

I am almost afraid to touch upon the machinery department. Every machinist was well represented in that wonderful part of the exhibition, which displays the breadth and power of English agriculture more, in my estimation, than even the animals. That all those complicated and expensive machines and implements of husbandry should have become the common utensils in trade of almost every farmer in the country holding 150 acres of land and upwards, speaks volumes for the present condition of that class. There were, however, several quite new machines; amongst which were Messrs. Burgess and Key's mowing machine, the patent of which they purchased of Mr. Owen, an American machinist; a corn-cleaning machine by Mr. Childs (also an American machinist), and which is confessedly the most efficient thing of the kind yet brought out; and last, but not least, the "Guide-way steam cultivator" of Mr. Halkett. I ought here to state, that I have found the attention of the farmers almost wholly absorbed by the question of ploughing by steam, which is now the desideratum to which the machinist must devote all his attention and ingenuity. Mr. Halkett delivered a lecture at the rooms of the Society of Arts on Wednesday evening, on the system he has invented; and as my space this week is filled up, I will write you again, and give you my opinion of the principle on which that system is based, having paid more than a common attention to the subject.

Yours respectfully,

London, Dec. 11.

AN OLD NORFOLK FARMER.

THE BEST KIND OF WELSH CATTLE—USEFUL, HARDY, AND PROFITABLE.

Sir,—The droves of Welsh cattle that come yearly into our midland counties to be fed appear as if many of them were bred by chance, like rabbits upon a warren—good, bad, and middling. But Colonel Pennant, within the last five or six years, has proved what some of the best of the said kind of cattle may be brought to, by giving them the same strength of food as the best of other kinds of cattle. As a proof, about five years back, Mr. Kirkby, of Park-street, purveyor to Her Majesty, purchased of Mr. Maydwell Col. Pennant's prize North Welsh ox for £65. The said ox weighed about 200 stone, and 30 stone of tallow was taken out of him; carcase and tallow, 250 stone of 8lbs. to the stone. He was very thick in his lean flesh, which was beautifully marbled; nay, very fine and silky in the grain. He was

an admirable specimen of what a Welsh ox ought to be—useful, ornamental, and profitable. The Welsh cattle are bought a great deal by the Leicester, Buckingham, and South Northamptonshire graziers at the latter end of the year, and used as scavengers, *alias* land-cleaners, by eating up the old coarse grass left by the fat cattle during the hot months. From their hale constitution, the North Wales ruts can bear the bleak winds in the winter much better than the fine, thin-skinned, handsome Durhams, Devons, and Herefords. The North Welsh cattle are second to none in strength of constitution, which is the foundation of all good sound and profitable breeding; an animal weak in his stamina may be compared to a bell without a clapper.

Mill Field, Peterborough.

SAM. ARNSBY.

THE SOCIAL CONDITION OF THE COUNTRY.

A parliamentary blue-book, recently issued from the Board of Trade by Mr. Fonblanque, supplies a large amount of curious and instructive information respecting the social condition of the kingdom; some of the leading details of which it may be interesting to notice, because they are not often brought prominently under consideration. We therefore proceed to take a summary view of some of these points, which may serve for reference and future comparison.

The estimated total population of Great Britain in June, 1856, was 22,080,449, of whom 11,278,170 were females. The births exceed the deaths nearly as 2 to 1. The number of marriages—179,824, in 1856—seem to bear the proportion of one-third to the deaths.

For England and Wales, the population, in 1856, was 9,357,035 males, and 9,088,152 females. The excess of births over deaths was 258,273; so that, in round numbers, the increase of population may be taken at a quarter of a million a year. The marriages in the metropolis seem to average about 26,000 a year, and in England and Wales about 159,000 a year. Looking at the ages at which the parties enter into wedlock, we find that while 206 females and 3 males of the early age of fifteen and sixteen were married in the year 1856, 973 men and 292 women above the age of sixty were married! About twenty appears to be the predominating age for entering into the holy estate, for 42,544 males and 45,651 females were married at that age. There seems, notwithstanding the number of marriages, to be a progressive increase in the number of illegitimate children.

The improving health of the metropolis is shown by the decreasing mortality in the face of a larger population.

In 1854, 1855, and 1856, the total deaths stood respectively at 73,697, 61,942, and 57,274. In the latter year, 3,141 died between the age of seventy-five and eighty-five, 793 at from eighty-five to ninety-five, and 42 died who had lived beyond that age—a circumstance unequalled in the returns of the kingdom, except in Wales, where 50 died over the age of ninety-five.

In Scotland, the population for 1856 is given at 3,035,262, of whom 1,590,018 were females. The births there were 101,748, and the deaths 58,456.

In 1856, 168 agricultural national schools are returned for Ireland; of which 37 are described as model schools, 51 ordinary, 3 school-gardens, and 77 work-house schools.

The total sum raised in England and Wales for the relief of the poor in the year ending Lady-day, 1857, was £8,330,210, which is a decrease of 1.8 per cent. on the previous year. The number of paupers on the 1st Jan., 1858, in receipt of relief in England and Wales was, in-door, 126,481; outdoor, including lunatics, vagrants, &c., 781,705. These figures show an in-

crease in the pauper returns of 6.9 per cent. over the corresponding period in 1857.

In Scotland, the total amount received for the relief of the poor in the year ending Whit-Sunday, 1857, was £669,853. The total poor of all classes receiving relief was 115,213 persons, of whom 103,427 were out-door paupers. There seems to be a gradual decrease in the number of paupers in Scotland in the last three years.

The decline of pauperism in Ireland is also a satisfactory feature, and indicates a highly improving condition of the people. From 80,966 relieved in July, 1855, the number decreased to 49,234 in 1857, and of these 20,404 were children under fifteen years of age. The present population is not given, but in 1851 it stood at 6,552,055. This number has, however, been very largely reduced by emigration. In the past three years more than 300,000 persons have arrived in Liverpool and other ports, principally outward bound to distant countries, chiefly to the United States and Australia. The total amount for poor rates in Ireland in the year ending Lady-day, 1857, was £645,631, being at the rate of 10½d. in the pound on the value of rateable property; in Scotland the proportion is 1s. 1d. in the pound.

The proportionate poor-rate expenditure per individual of the population, by the latest returns, would seem to be in the following ratio in different parts of the Kingdom: In England and Wales, 6s. 1¾d. per head; in Scotland, 4s. 4¾d.; in Ireland, 1s. 10½d.

The criminal returns of the last three years speak favourably of the improving moral condition of the country, which are strikingly marked in England and Wales and Ireland, although less so as regards Scotland. The committals for trial in England and Wales have dropped from 29,359 in 1854 to 19,437 in 1856; in Ireland from 11,788 to 7,099; but in Scotland only from 3,994 to 3,713.

The emigration returns for the United Kingdom show the following progress: In 1855, 176,807 persons left; in 1856, 176,554; and in 1857, 212,875. Last year, of the emigrants, 78,500 were English, 16,253 Scotch, 86,238 Irish, 12,624 foreigners, and 19,200 not distinguished. With the increased exertions and Government outlay by the Cape colony, by Victoria for its extensive railway labour, and by Canada, with the cheap steam communication in prospect across the Atlantic, a largely increased tide of emigration may be looked for next year. The proportion of females to males now leaving the country is much larger than in former years; but there is no doubt that it might be more extensively increased, to their individual benefit, looking to the demand both for domestics and helpmates in the colonies. Of the bulk of the emigrants last year, 126,905 went to the United States, 21,000 to Canada and the British provinces, and the great bulk of the remainder, 61,248, to the Australasian settlements, 41,000 of these proceeding to Victoria. When we find such aids as £600,000 to

£900,000 remitted annually by settlers in North America, and £59,000 from Australia to their friends at home towards passage and outfit, we cannot wonder that the emigration is vigorous. And this is only what is officially known to be sent through bankers and merchants, but large sums also come home for the same purpose through private hands.

There is another feature in the return before us which deserves notice, and that is the Savings' Bank returns, which are a mark of the progress of the condition of the people. The amount of money deposited in the Savings' Bank and Friendly Societies seems to increase at the rate of about £2,000,000 a year, or rather more. In 1856, £78,801,612 was thus lodged with the National Commissioners for Great Britain and Ireland. In England there were 469 Savings' Banks, in which the deposits made by 1,135,390 depositors was £30,404,870, or on the average £26½. In Wales there were 31 Savings' Banks, 29,277 depositors, and £878,844 lodged, being an average of £30. In Scotland 47 Savings' Banks, with 119,497 depositors, and £1,938,572 lodged, averaging about £16 4s. to

each depositor. In Ireland the number of banks was 52, of depositors 57,508, and the amount of money £1,723,726, being an average of nearly £30. The total for the kingdom shows an average amount of £25 invested by 1,318,047 individual depositors, in 599 Savings' Banks. But these banks are used largely as deposits for trust funds by charitable institutions, and friendly societies, from the security offered; and there were 14,579 of the former, with an average deposit of £48, and 9,946 of the latter, whose average deposit was £155 10s. The average rate of interest paid seems to have been about £2 18s. 8d. The number of annuities not exceeding £30 each to the industrious classes, granted by the Commissioners, was, in 1856, 10,843, the total amount of them £185,515. The total amount paid for annuities since the commencement, for life and term of years, has reached £2,124,914, a very favourable indication of the provident habits of this class of people.

There are other features in this return having special reference to the agricultural community, to which we may direct attention hereafter.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A MONTHLY COUNCIL was held on Wednesday the 1st of December: present, His Grace the Duke of Marlborough, President, in the Chair, Lord Berners, Lord Feversham, Lord Leigh, Hon. Colonel A. Nelson Hood, Hon. William George Cavendish, M.P., Mr. Raymond Barker, Colonel Challoner, Mr. Exall, Mr. Brandreth Gibbs, Mr. Fisher Hobbs, Mr. Wren Hoskyns, Mr. James Howard, Mr. Humberston, Mr. Milward, Mr. Pain, Mr. Thompson, Mr. Torr, Mr. George Turner, and Professor Voeleker.

Lord Leigh, of Stoneleigh Abbey, Warwickshire, was elected a Governor of the Society.

The following new Members were elected:—

Baily, Thomas Farmer, Hall-place, Leigh, Tunbridge
 Bayzaud, Joseph, Arrow, Alcester, Warwickshire
 Bouck, John T., 13, Oxford street, Manchester
 Davies, James, Moor Court, Herefordshire
 De Salis, Rev. Henry Jerome, Wingford Rectory, Oxfordshire
 Docker, Ludford, Paul's Hill, Leigh, Tunbridge
 Foster, William O., M.P., Stourton Castle, Stourbridge
 Harris, John, Springfield, Bedford
 Hawkesley, Archibald, Englefield-green, Surrey
 James, Thomas, Copc, Bedfordshire
 Jeykell, E. J., jun., Royal Agricultural College, Cirencester
 Lascelles, Hon. George Edwin, Moor Hill, Harewood, Leeds
 Locock, Frederick, Hertford-street, Mayfair, London
 Lyon, Captain, T. D., Soundness House, Henley-on-Thames
 Stevenson, Charles Benjamin, Hensor House, Leominster
 Stullgoe, Henry, Chapel-Ascot, Southam, Warwickshire
 Olorenshaw, Joseph, Berkswell, Coventry
 Pike, William, Steventon, Bedfordshire
 Piggot, James Algernon, Beckenham Hall, Witham
 Praed, William Backwell, Tynningham, Newport-Pagnell, Bucks
 Silver, Rev. Frederick, Norton-in-Hales, Market Drayton
 Watt, Gibson, Doldlowe, Radnorshire.

FINANCES.—Mr. Raymond Barker, Chairman of the Finance Committee, presented the monthly report on the accounts of the Society, from which it appeared that the current cash balance in the hands of the bankers

was £268. On the motion of Mr. Raymond Barker, the names of Colonel Challoner and Sir John Shelley, Bart., M.P., were added to those of the Duke of Richmond and Lord Portman, as trustees for the investment of Stock.

AGRICULTURAL CHEMISTRY.—Mr. Wren Hoskyns, Chairman of the Chemical Committee, read the following report from Professor Voeleker, the Consulting Chemist of the Society:

I have the honour of submitting to the chemical committee a short account of the labours that have been entrusted to me by the Council of the Royal Agricultural Society, since my appointment in February last.

The January number of the Journal contains the results of an experimental inquiry into the theory of paring and burning, an inquiry with which I had been occupied for some considerable time before my appointment.

The last published volume contains a full report of experiments relating to the germination of turnip seed, and on field experiments upon swedes, which I have undertaken with a view of ascertaining the fertilizing constituents most conducive to the production of an abundant crop of swedes. Similar experiments I have again undertaken this season, and shall continue them from year to year, for trustworthy deductions cannot be made from field experiments unless such experiments are carried over a number of years.

While referring to the cultivation of swedes I may observe that I have given attention during the past summer to the Stevensen in turnips, and have recently had an opportunity of observing a remarkable case of anbury; which disease in this special instance could be traced to the deficiency of lime in the whole field, and almost total absence of this constituent in the parts of the field in which the roots were most affected by anbury.

I have now in hand the soil's from parts of the field upon which the turnips failed completely, and from other parts of the same field where the roots were less severely affected by that disease, and hope to communicate the results of my inquiry and suggestions to remedy the evil to the Society at a future period.

The economical advantages of cotton seedcake as an auxiliary

article of food are becoming more and more known to the English farmer.

During the past season I have analyzed several samples of cotton seed cake sent by members of the Society, and procured other samples for examination. No description of cake I find differs so much in composition as cotton-cake.

I hope to furnish a paper on the average composition of cotton-cake and its feeding value, in the forthcoming volume of the Society's Journal.

There are several other kinds of feeding materials, the composition of which as yet has not been determined by rigorous analysis; on the recommendation of the committee the composition and feeding value of such food might be ascertained by your chemical officer.

I may state in this place that I have already ascertained the composition of Dari or Daura grain, a newly-imported farinaceous seed of the size of a large millet, and extensively used for feeding purposes in the East; I have also determined carefully the composition of several kinds of oilcakes that rarely find their way into commerce.

The uses of made-up cattle food have likewise occupied my attention. The conclusion to which I am led by the analyses of three or four different samples of food of that description agree so entirely with the opinions expressed in Mr. Lawes' paper in the last volume of the Society's Journal, that I need not here enter into details to prove the fact that purchasers of such cattle food as that examined by me may readily procure equally nutritious and fattening food at something like one-fourth the cost at which such made-up cattle food is sold at present.

Most samples of cattle food which I have hitherto examined contain large proportions of rice-meal (the refuse of rice-dressing mills), oat dust, and the sweepings of flour mills, mixed with spoiled and inferior flour. The bad taste and fusty smell of the latter are concealed by strong smelling drugs, such as fenugreek, or anise or fennel seed, and also by bitter substances, such as gentian. In one particular sample, much recommended as food for pigs, I have found the bulk of the meal to consist of crushed carrots, beans, rice, and barley-meal; this food also contained some sulphur and nitre, as well as fenugreek, and a little auisec; it was, in fact, a regular medical powder.

I have devoted a part of my leisure in the past summer to an agricultural tour in North and South Wales, and purpose each year to set aside a portion of my vacation to similar agricultural tours in other parts of England; for I feel strongly impressed with the mutual advantages that will spring from a close and familiar contact of your chemical officer with intelligent agriculturists, and am convinced that much good may be conferred upon the farming community at large by our united efforts to promote agricultural progress. The analytical work performed by me and assistants, on behalf of members of the society, has been very brisk during the past season—making analyses of soils, marls, chalks, freestones, oilcakes, artificial manures. Among them, I am sorry to say, many adulterated manures, and all but worthless, or very inferior, fertilisers, &c., &c., have been analyzed in the laboratory; and it affords me much pleasure in informing the chemical committee that I have received several letters, stating that my reports were the means of saving intending purchasers considerable sums of money. In order to return analyses referred to me without delay, and to carry on at the same time the field experiments and more scientific laboratory researches entrusted to my care, I have found it necessary to engage a staff of four competent assistants. My first assistant has taken an active part in several researches carried out in my laboratory, and has just issued a treatise on Agricultural Chemistry, which I have reason to believe will be appreciated by the agricultural public. My second assistant has been educated at King's College, London, where he has gained several prizes in various departments of knowledge. My third assistant is a thoroughly trained and careful analyst. The salaries for assistants and other necessary laboratory expenses amount to a considerable sum of money, which, indeed, I would not be justified in incurring to the same extent, if the college authorities did not liberally assist me in meeting these expenses.

AGRICULTURAL IMPLEMENTS.—Colonel Challoner, Chairman of the Implement Committee, read the following report, which was unanimously adopted:

The committee having taken into their consideration the

memorial of a meeting of implement-makers at the Chester meeting, it appears to the committee that, in consequence of the large increase of the number of implements during the two past years, a further extension of the period for the trials will in future be required. On due consideration, the committee feel that it will be advisable to have the system of trial extended over four years, instead of three, agreeably with the following schedule, in which it will be perceived that the trials in the field and in the yard will take place in alternate years:

	1859.
Ploughs	Rollers
Harrows	Tile and Brick Machines
Cultivators	Draining Machines
Clod-Crushers	
	1860.
Combined and other Threshing Machines	Mills Oilcake Breakers
Chaff Cutters	
	1861.
Drills	Reaping Machines
Manure Distributors	Horse Rakes
Horse Hoes	Carts
Hay Machines	Waggons
Mowing Machines	
	1862.
Fixed and Portable Steam Engines	Hand Dressing Machines Barley Hammellers
Fixed and Portable Finishing Machines	

In each year, such special prizes as the council may determine, and medals for miscellaneous improvements, shall as formerly be offered.

The committee recommend that, when practicable, a tabular statement of the results of the trials of machinery shall be issued previously to the opening of the implement showyard.

The committee do not recommend any alteration of the long-established rule by which every implement exhibited is liable for trial in the prize-classes of the year.

Mr. Smith's protest against the award of the judges of steam cultivation, at the Chester meeting, in favour of Mr. Fowler's apparatus for steam ploughing, on the ground that the judges were misled by Mr. Fowler's statement of the "lowest selling price" having been taken, by the special Implement Committee, into their due consideration, they beg to report to the council the following points of the case:—

1. Mr. Fowler, in his specification of entry, includes no reference whatever to those *extra* portions of his apparatus, which in the private catalogue, stated by Mr. Smith to have been distributed by Mr. Fowler at Chester, raised the price of the complete apparatus for working purposes to £153 beyond the price stated by him in the specification of entry with the society.

2. As the judges of the Society were guided in their proceeding only by the Society's official catalogue, and based their calculations entirely on the lowest selling price therein stated, the economy of the work performed by Fowler's Steam Ploughing Apparatus was overstated to a certain extent, in consequence of the incompleteness of the date of price furnished to them. The judges, however, have reported as follows on that point:—"Had Mr. Fowler's revised prices been made known to us officially, and not merely communicated by him to one or more of us individually, they would have caused a slight modification in our estimates, but certainly would not have affected our decision." The committee cannot, however, exonerate Mr. Fowler from the imputation of much blame in not having taken the earliest and most effectual steps to place the judges in full possession of a knowledge of the alteration he had made in so important an item as the cost price of his working apparatus.

3. No evidence has been adduced before the committee that Mr. Fowler has evaded the rule of the Society, which obliges every exhibitor, on pain of exclusion from future exhibition, "to execute all orders given to him in the show-yard at the price stated in his specification."

4. The committee recommend to the council that a rule should be introduced into future certificates and specifications of entry, requiring that the prices entered on them shall be the prices of the respective articles of machinery entered for com-

petition and trial at the country meetings of the Society complete and in good working order.

Colonel Challoner also read to the Council a special report of an alleged false entry, or otherwise an infringement of patent-right, in reference to one of the miscellaneous machines to which a silver medal had been awarded by the judges at Chester. The Committee having examined, witnessed, and perused a lengthened correspondence on this contested subject, recommended that the medal should be farther withheld, until, by the provision of the 38th Regulation of the Chester Prize-sheet, "a reasonable period shall have been granted, to allow the trial of the rights of the parties at law; and if no steps at law are taken, in the next term, the award shall be absolute."

IMPLEMENT PRIZES FOR 1859.—Colonel Challoner further reported for the Implement Committee the following schedule of classes of prizes proposed for the Warwick Meeting :

Class of ploughs	£40
Class of harrows	20
Class of cultivators	20
Class of clod-crushers	10
Class of rollers	10
Class of tile and brick-machina	20
Class of draining machines and implements	20

On the motion of Mr. Thompson, seconded by Mr. Torr, the Council resolved that a Special Prize of £50 should be offered at the Warwick Meeting "for the best application of steam-power to the cultivation of the soil."

WARWICK MEETING.—Lord Berners, Chairman of the General Warwick Committee, reported the following recommendations—1. That the Warwick Meeting should be held next year in the week commencing Monday, the 11th of July; and 2. That the Local Prizes placed at the disposal of the Council by the Local Committee, and to be awarded under the general regulations of the Society, should be accepted. These recommendations were adopted.

LIVE-STOCK PRIZES.—Mr. Milward reported from the Live-Stock Prizes Committee, the schedule of prizes in that department, which was adopted.

REFRESHMENT STEWARD.—On the motion of Mr. Branlreth Gibbs, seconded by Lord Berners, the following resolution was carried unanimously :—

"That, in order to secure the Refreshments supplied for the Public in the Show Yard being properly conducted, there be in future a Steward of Yard Refreshments."

SOUTH-AFRICAN AGRICULTURE.—The Hon. and Rev. Samuel Best, of Abbot's Ann, near Andover, having represented to the Council how great it would prove to the agricultural community at the Cape of Good Hope if a grant of the Society's *Journal* were made to the Agricultural Library established at Graham's Town, and how strong a mark of sympathy it would be regarded by the settlers of that colony, it was moved by Mr. Wren Hoskyns, seconded by Mr. Torr, and carried unanimously, that a complete set of the *Journal* should be placed at Mr. Best's disposal for his purpose.

CATTLE DISEASE IN PORTUGAL.—The Earl of Malmesbury transmitted a despatch from H. B. M.'s Consul-General at Lisbon, reporting a violent outbreak of the "foot-and-mouth disorder" among the cattle of that kingdom. The Council directed that Professor Simonds, as the Veterinary Inspector of the Society, should be requested to make a report to them on this subject.

AUDIT OF ACCOUNTS.—The Half-yearly Audit of Accounts was held on Friday, the 3rd of December: present, Mr. Raymond Barker and Colonel Challoner, on the part of the Finance Committee, and Mr. William Astbury and Mr. Joseph Druce, auditors on the part of the Society. The accounts were examined, audited, and certified as correct.

The Council stands adjourned to its Weekly Meeting on Wednesday, the 8th of December (at which all Members of the Society have the privilege of being present).

The ANNUAL MEETING of the Members of this Society took place at the Society's House, in Hanover-square, on Friday last, under the presidency of Lord Berners. Amongst the gentlemen present were Lord Feversham, Mr. Slaney, M.P., Mr. Mark Philips, Mr. S. Druce, Mr. Druce, jun., Mr. J. Kinder, Mr. D. Martin, Mr. W. F. Hobbs, Mr. Astbury, Mr. S. Sidney, M. Trehonnais, Mr. H. Corbet, Mr. C. Sewell Read, M. A. Paquerec, Professor Voelcker, Mr. T. Pain, Mr. H. J. Hare, Mr. W. Torr, Mr. T. Duckham, Colonel Challoner, Mr. Pope, Mr. Crofts, Mr. H. J. Keys, and Mr. J. B. Caldwell.

At the request of the President, the Secretary, Mr. Hudson, read the Report of the Council as follows :

REPORT.

The Society consists at the present time of—

79 Life Governors,
134 Annual Governors,
916 Life Members,
4076 Annual Members, and
18 Honorary Members,

making a total of 5223 members, or an increase of 77 names on the list since the last half-yearly meeting. The Council have filled up the vacancy in their body, occasioned by the decease of Mr. Paiae, of Farnham, by the election of Mr. Thomas, of Liddington.

The funded property of the Society in the name of the trustees has been raised by further investment to the amount of £10,000 stock in the New Three-per-cents.

Mr. Dyke Acland and Mr. Wren Hoskyns having found that their own more immediately personal engagements would not allow them conveniently to act longer as joint-editors of the *Journal*, Mr. Thompson, their remaining colleague, has undertaken the sole editorship, on the condition that the sum of £300 be placed annually at his disposal for the purpose of procuring such subsidiary aid connected with the details of the work as he may find desirable. The Council have expressed unanimously to Mr. Acland and Mr. Hoskyns their sense of the high value they have attached to the services rendered by them in their co-operation with Mr. Thompson, during the period of their voluntary engagement; and they have gratefully accepted the offer of Mr. Thompson to continue his valuable services as the sole editor of the *Journal*.

The Council have adopted the following schedule of Prizes for Essays and Reports, to be sent to the Secretary by the 1st of March next, namely—

Results of Microscopic observation applied to the Vegetable Physiology of Agriculture ..	£50
Agriculture of the Islands of Jersey, Guernsey, Alderney, and Sark ..	25
Steam Cultivation ..	25
Extent to which Tillage operations act as a Substitute for Manure ..	20
Modification of Four-course Rotation consequent upon modern improvements ..	20
Varieties of Wheat, Barley, and Oats best adapted for high farming ..	20
Causes of the increasing difficulties of Turnip Cultivation, and the Remedies ..	20
Comparative Cost of high-condition of land produced by purchased Cattle Food, or by purchased Manure ..	20
Any other Agricultural subject ..	10

Lectures have been delivered before the members by Professor Henfrey on Vegetable Physiology, and by Professor Simonds on the Composition of the Blood, and the Diseases with which that fluid is connected in the animal economy.

Professor Voelcker, the Consulting Chemist of the Society, has made to the members, at the weekly councils, various communications on points of practical interest connected with the adulteration of guano, and the feeding properties of cotton-seed cake. He has also recently presented to the Council, through the Chemical Committee, a detailed statement of the works carried on by him as the Chemist of the Society, in his Laboratory at Cirencester, and also a plan of the various arrangements he has in contemplation, in order that he may be enabled more fully to carry out the practical usefulness of his scientific labours. The Council have adopted an enlarged schedule of the privileges enjoyed by members of the Society in availing themselves of Professor Voelcker's professional aid.

The Chester Meeting proved in every respect the most important one hitherto held by the Society; the number of visitors exceeded by many thousands the average amount of former years, and the liveliest interest was exhibited throughout the district in the proceedings of the occasion. The Mayor and Corporation, and the Local Committee acting under their authority, spared no efforts to render the meeting successful; while their hospitality and cordial reception to the members of the Society were on all sides gratefully acknowledged. The show of Cheshire cheese, and of the animals competing for the local prizes, added greatly to the interest which must under any circumstances have been excited by the excellent stock competing for the prizes of the Society, and by the trials and public working of the magnificent array of steam engines and other agricultural implements and machinery sent to the meeting.

The Council have decided, that the Warwick meeting shall be held in the week commencing Monday, the 11th of July next. Already the several portions of land in that neighbourhood have been placed under suitable management for the purposes of the trials of implements, and the site of the show-yard has been surveyed by the Society's contractor of works, with a view to its being duly prepared, under the instruction of the Warwick Committee, for the exhibition of the stock and implements. The Council have adopted a series of local prizes, placed at their disposal by the Local Committee, and to be competed for under the general regulations of the Society, and to be open to general competition, with the exception of the prizes for cheese, which will, at the request of the Local Committee, be restricted to cheese made within the county of Warwick. The Society's prizes for live stock will exceed by £53 the total amount of prizes offered last year in this department; and third prizes have been added to the great majority of the classes for cattle, sheep, and pigs. The Council have decided to adopt several arrangements connected with the mode of distinguishing the prize animals, the restriction of local prizes to competition in their own classes, and the management of refreshments for the public, which they hope will be found to be improvements in their respective application. The Council have also decided on the following prizes, to be offered in the department of implements at the Warwick meeting, namely:—

Class of Ploughs ..	£40
Class of Harrows ..	20
Class of Cultivators ..	20

Class of Clod Crushers ..	£10
Class of Rollers ..	10
Class of Tile and Brick Machines ..	20
Class of Draining Machines and Implements ..	20
Special Prize for the best application of Steam Power to the Cultivation of the Soil ..	50

The triennial system for the trial of implements, which commenced in 1855, at the Carlisle meeting, has terminated this year at Chester; and it has, therefore, been necessary for the Implement Committee, at the request of the Council, to take into their deliberate consideration the question of the renewal, discontinuance, or modification of that system. The Council have adopted the recommendation of the Committee, that, instead of three years, the trials should in future be distributed over a period of four years, the trials in the field and in the yard occurring every alternate year, such special prizes, and medals for miscellaneous improvements, being also offered each year as the Council may determine. The following is the schedule of this arrangement:—

I.—1859.	
Ploughs.	Clod-crushers.
Harrows.	Rollers.
Cultivators.	Tile and Brick Machines.
II.—1860.	
Combined and other Thrashing Machines.	Mills.
Chaff Cutters.	Oil-cake Breakers.
III.—1861.	
Drills.	Mowing Machines.
Manure Distributors.	Reaping Machines.
Horse-hoes.	Horse-rakes.
Hay Machines.	Carts and Waggons.
IV.—1862.	
Fixed and Portable Steam Engines.	Hand Dressing Machines.
Fixed and Portable Finishing Machines.	Barley Hummellers.

They have also decided that in future specifications of entry, "the prices stated shall be the prices of the respective articles of machinery entered for competition and trial at the country meetings of the Society, complete and in good working order."

The Council have the satisfaction of recording the rapid advances of the Society in carrying out successfully the several objects for which it was established.

By order of the Council,

JAMES HUDSON, Secretary.

London, December, 1858.

Mr. ASTBURY having moved, and M. TREHONNAIS seconded the adoption of the report,

Mr. S. SIDNEY said, that before the motion was put to the meeting he was desirous of making an observation or two upon the report. It would be in the recollection of many of the gentlemen then present, that on previous occasions, at Chelmsford, at Salisbury, and again in this room last year, he took the liberty of making some suggestions which he thought were for the benefit of the Society; and he believed he might flatter himself that those suggestions had not been altogether in vain; inasmuch as it was quite impossible to listen to the report just read, without seeing that very considerable improvements had of late been introduced into the management of the Society. Moreover, he granted also that there had been improvements which were not mentioned in the report. Now it was perfectly notorious, and it was a subject of general complaint, that the Council of the Society had not hitherto contained so many working members belonging to the great agricultural body as the importance, the numbers, and the intellect of the tenant farmers of the country deserved. Since he had made the remarks to which he had referred there was no doubt that several gentlemen of considerable intelligence had been introduced to the Council.

Still, he ventured to think, and in that opinion he was supported by the great body of the farmers, that that measure had not been carried far enough, and that there were yet a considerable number of gentlemen on the Council who, though of the highest respectability, were little better than ciphers in an agricultural point of view. He knew that it was said at Salisbury by a gentleman who defended the Council, and was a tenant-farmer himself, that the tenant-farmers would not attend. But with regard to that argument he thought he could give facts which would at once set it completely at rest. He had had the honour of belonging, for a considerable number of years, to the Central Farmers' Club—a society not so numerous as this, but celebrated for containing within its ranks a large body of practical men. That Club met seven times in the year to hold discussions. It had a large Committee, and he believed he should be borne out by the members of the Club then present—at any rate by those who took an active part in its proceedings, when he said that the meetings of the Club always comprised a great proportion of practical farmers. And the importance of those meetings—an importance which might be easily imitated by the Royal Agricultural Society, if it chose—could be gathered from the fact that the papers and discussions of the Club, having been immediately reported and spread throughout the length and breadth of the land, had led to great and important changes. Indeed, at a recent meeting of the Society of Arts, it was stated that the discussions of the Central Farmers' Club on the steam-plough had done much to promote the application of steam to autumnal cultivation. He trusted, then, that the Council would take into consideration that, since the Royal Agricultural Society was founded, the number and intelligence of the tenant farmers of England had greatly increased, and seize the earliest opportunity of introducing a larger portion of that element into their own body. If they would do that, they might rely upon it that they would find no difficulty in getting gentlemen to attend their meetings as punctually as they did in the comparatively small society, the Central Farmers' Club. He would not make any remarks about the Journal, which he admitted had been put in a more satisfactory state since last he addressed them upon the subject, neither would he refer to the prize-list; because, although he had been told that any change was unnecessary, it had nevertheless been thoroughly considered, several changes had been introduced, and the list placed upon a better footing. But there was one point to which he was very anxious to direct attention—he meant the weekly meetings. At present, in consequence of the exclusion of reporters, those meetings were nothing better than a farce. Now the society had immense means at its command, and a great number of its most intelligent members were anxious to contribute to the usefulness of those meetings; but they did not like to come forward with useful papers, if it was their fate to be buried and never heard of more, as he feared was the case with many a valuable contribution of the sort. He trusted that the weekly meetings of the Society would not be much longer treated like a French police court, as if there were something dangerous in reporting what the members might have to say. The value of an immediate report of a useful discussion was strikingly proved by the Central Farmers' Club, of which his lordship in the chair was a member. Some years ago the Farmers' Club did not publish its discussions, but left it to the newspapers to do so, and that alone gave very great support to the Club. But when it went a little further, and circulated a report of its discussions amongst the members, a great accession was made to its ranks. He knew that it was not possible to do this in the Royal Agricultural Society; but

he should be borne out by every practical man who heard him in saying that when useful papers were brought forward the Council might allow the Press to disseminate them, with the view of obtaining criticisms upon them; so that if they were good they might be made useful, and if not that their fallacies might be exposed. Any gentleman who took the trouble of turning to the seven discussions of the Central Farmers' Club during the past year would at once see that those which were useful created immediately a great deal of attention. No sooner, indeed, was the essay upon autumnal cultivation published than the newspapers were literally overwhelmed with correspondence of the most interesting description in reference to that subject; and he had been informed by a gentleman who was engaged in promoting steam ploughing that the discussion had done more to accomplish that object than anything else. He would also take that opportunity of observing that he thought the time had arrived when the Royal Agricultural Society should take stock of what it had done. He was certain that nothing could more contribute to its usefulness, or forward the great object for which it was originally established, than now, at the end of twenty years from its foundation, to adopt some means, such as the preparation of a series of questions relating to every subject connected with agriculture, and the circulation of those questions amongst its members in the various counties, of ascertaining what progress had been made in every department of agriculture since the year 1838, when the society was first instituted. If they would only make use of the very intelligent members who were to be found in the ranks of the society, and other gentlemen who would be quite as ready to render their services in circulating a series of questions throughout their several districts, as to what changes had been effected in the management and breeds of live stock, what progress had been made in the use of improved implements, and what implements had been found to be the most successful; what changes in, and additions to, manures had been made, and what had been the general result; he was sure that the answers to such questions as he had thus faintly indicated, when digested into a report, would prove to be a document far exceeding in value anything in the shape of agricultural statistics that could be obtained, and that without prejudice to any one (hear). It would tend still further to promote the usefulness of the society, and to raise it in the estimation of the great body of the agriculturists of the kingdom. He hoped that, in what he had said, he had not laid himself open to a charge of egotism. It was rather a bold thing for a man like himself to stand up there, and make these observations. That he was quite aware of; but, since last he addressed the society, at one of its meetings, he had taken considerable pains to obtain the confidence of the agricultural public, and he believed that, without being egotistical, he had achieved some measure of success. He confessed that he could have wished some more influential person had come forward and addressed the meeting on this occasion; but he trusted the observations he had taken the liberty of making would be regarded as intended to promote the usefulness of the society, which no man was more desirous of assisting to increase than himself.

The CHAIRMAN said he could bear his meed of praise to what had been accomplished by the Central Farmers' Club; but this was not a debating society, and it was most desirable that it should not be permitted to lapse into anything of the sort. Mr. Sidney had the advantage of the press being represented here to-day, and there was no doubt that his remarks would go forth to the public, and be appreciated by the council in the manner they deserved.

PAYMENTS.

Permanent charges	£170 12 6
Taxes and rates	10 10 6
Establishment charges	619 14 6
Postage and carriage	28 13 1
Advertisements	6 12 6
Journal payments	1199 13 2
Essy prize	20 0 0
Veterinary grant	100 0 0
Balance to Professor Simonds on account of mission abroad in reference to the cattle plague.. .. .	150 0 0
Chemical grant	150 0 0
Country meeting payments:—	
Salisbury	948 0 7
Chester	1803 17 0
Subscriptions (overpaid by the bankers) returned	8 0 0
Horse-shoeing tracts	40 8 6
Sundry items of petty cash	5 7 8
Balance in the hands of the bankers, June 30, 1858	2225 15 9
Balance in the hands of the secretary, June 30, 1858	3 14 4
	£7491 0 1

Examined, audited, and found correct, this 3rd day of Dec., 1858.

(Signed) WILLIAM ASTBURY, } Auditors on the part
 JOSEPH DRUCE } of the Society.

Mr. CORBET moved a vote of thanks to the auditors, who, he remarked, seemed to have a very pleasant duty to perform, in consequence of the admirable manner in which it was generally understood the books were now kept (Hear, hear).

Mr. SEWELL READ seconded the motion.

The CHAIRMAN said that the Council felt very much indebted to the auditors for the hints with which they had from time to time favoured them. Upon those hints the Council had endeavoured to act; and he believed the auditors were now perfectly satisfied with the manner in which the accounts were kept (Hear, hear).

Mr. ASTBURY: They are so—perfectly.

The motion was agreed to, and briefly acknowledged by Mr. Astbury, who observed that he could take upon himself to verify the state in which the Society's accounts were now kept. The management was so admirable that the duties of the auditors were rendered exceedingly pleasant (Hear, hear).

On the motion of Mr. Corbet, seconded by Mr. Read, the auditors were then re-elected.

Mr. TORR had much pleasure in moving a vote of thanks to Professors Voelcker, Heufrey, and Simonds, for their excellent

lectures, which he regarded as one of the best features of the society, in promoting its great object, the advancement of the science and practice of agriculture. Lord Feversham had referred to Professor Voelcker's journeys through the Principality; and he (Mr. Torr) might perhaps be allowed to suggest that the members of the Royal Agricultural Society would materially assist the professor in conducting his inquiries by giving him the best practical information in their power (Hear hear). For, however useful the professor's tours might be, or excellent his intention in undertaking them, it was possible that they might not produce all the good results anticipated from them for want of bringing practical knowledge to bear upon what was purely scientific (Hear, hear). They might depend upon it, that whilst agriculture could not advance without science, science was of little use without good practical details; for, after all, it was the good practical details which kept a man's pocket from getting quite empty (Hear and a laugh).

Mr. SIDNEY seconded the motion, and expressed his concurrence in the observations which had fallen from Lord Feversham, respecting Professor Voelcker's exertions; but he wished to see those exertions extended to every member of the society, not one of whom would be unwilling to furnish the professor with the facts he required.

Lord FEVERSHAM had not the slightest doubt that, as he had stated, Professor Voelcker would hold communication with, and take the opinion and advice of, all the most eminent agriculturists and tenant farmers of the kingdom; and he (Lord Feversham) had no apprehension whatever that these gentlemen would decline to impart such information as they possessed relating to the culture of the soil, and the system of farming which was carried on in their respective districts.

The motion was carried unanimously.

The CHAIRMAN having asked if any gentleman had a question to put, or a suggestion to offer for the consideration of the Council,

M. TREHONNAIS said he would take the liberty of suggesting, for the consideration of the Council, that as there was a prize now given for bull-calves under 12 months old, it was also advisable to give a prize for heifer calves of the same age (Hear, hear).

The Chairman directed Mr. Hudson to take a note of M. Trehonnais' suggestion, in order to its being submitted to the Committee on Cattle Prizes for the ensuing year.

Lord Feversham then moved, and Mr. Kinder seconded, a vote of thanks to Lord Berners, the President of the Society, and to Col. Challoner for presiding as Chairman that day.

The motion was carried by acclamation; and, having been briefly acknowledged by Colonel Challoner, the meeting separated.

IMPORTANT JUDGMENT—THE TENURE OF LAND—“LANDSHARE.”

ABERGAVENTNY.

[Before J. M. HERBERT, Esq., County Court Judge.]

WILLIAM WILLIAMS v. WILLIAM HOWELLS. — The plaintiff is the owner and present occupier of Penire Farm, in the parish of Tregare. The defendant was his tenant for eight years up to Christmas last, and on his quitting the plaintiff took the farm into his own hands. The defendant held under a lease or agreement, dated the 6th Feb., 1849, by which the plaintiff agreed to let the farm from the 25th December then

last, for one year, and so on from year to year, until six months notice should be given by either party to determine the agreement, at the yearly rent of £103, payable half-yearly. The defendant agreed “not to underlet the said premises, or any part thereof, or sell hay or straw, or any kind of fodder, without the consent of the said Williams or his trust (sic), to manage the lands in a proper husbandlike manner, and according

to the custom of the country; and, upon quitting, to leave the hedges, ditches, gates, and atiles in a proper state of repair." And it was further agreed by the plaintiff "to allow £3 per annum for manure. Also, in case he should want the farm to his own hand in the space of three years to pay £20 of money to the said William Howells, for quitting the farm at six months' notice." It was admitted by the plaintiff that the defendant, according to the custom, was entitled to two-thirds of the wheat crop, but he claimed the remaining one-third as the incoming tenant's portion or "landshare," as it is termed in this county, the universal custom being, as he alleged, to give the incoming tenant one-third of the wheat sown on a ley, and one-sixth of the wheat sown on a naked fallow. The defendant denied the plaintiff's right to any landshare by reason of his having been excluded from landshare at the commencement of his tenancy, his predecessor having been entitled, under an agreement which he had made with his landlord, a former owner of the estate, to the whole of the away-growing crop, the defendant contending that, according to the custom of the country, when a tenant on entering takes no landshare, he is not liable to leave any on his quitting. The defendant having cut the wheat crop and put it into stacks (as it was admitted he was bound to do whether or not the plaintiff was entitled to landshare), and having told the plaintiff he did not intend to leave any landshare for him, the plaintiff ordered the gates of the fields to be locked, and the defendant afterwards broke the locks, and carried away the whole of the wheat crop. The plaintiff then brought this action, claiming £10 for the alleged trespass of breaking the locks, and £26 3s. 10d. as the value of the plaintiff's landshare thus taken away and converted by the defendant. It was proved by Ellaway, the outgoing tenant, who quitted in the same year as plaintiff purchased the farm, that he had a conversation with the plaintiff about the landshare; that he told him that he had no landshare on entering, and that he did not intend leaving any; that he had a document under the hand of his original landlord Mr. Watkins, "that freed him from having one;" and that plaintiff said, "if you have such a document I am satisfied." The document was as follows:—"August 8th, 1843. Memorandum of an agreement between Mr. Arthur Ellaway and the undersigned. In consideration of Mr. Ellaway not having any landshare upon his taking the Pentre, he will not be entitled to leave any after quitting the said farm, but must not leave on the said farm more than his odd mark in wheat.—J. C. Watkins." This document was also shewn to the defendant before he took the farm. It was proved by defendant, that, *after he had taken the farm*, he had a conversation with plaintiff about the landshare; that he said to plaintiff, "What about landshare?" Plaintiff said to him, "Don't the custom of the place give a landshare?" "No, I don't think it does, as Mr. Watkins has done away with it." "If Mr. Ellaway has a document to show from Mr. Watkins, that will be an end to it;" and that he (the plaintiff) then saw the document referred to, and gave up all claim for landshare. It was proved by several farmers, who had lived for years in Tregare, or in the neighbouring parishes, that the general usage of the district was, that the off-going tenant should leave no landshare for his successor when he had none left by his predecessor; and their evidence was uncontradicted. But some of them stated that some of the principal landowners of the district (and they instanced the Duke of Beaufort and Colonel Clifford) were desirous of doing away with the landshare; and that they let their farms exempt from the landshare; and it was open to much doubt whether their testimony affirmed any general usage excluding the landshare, or whether it merely referred to instances where the landshare was done away with by special contract. Mr. James Price, on

behalf of the defendant, contended—1st. That where the landlord of a farm has broken through the custom, by depriving his tenant of the landshare, the farm becomes for ever exempt from liability to landshare; and 2dly. That even supposing his first proposition could not be maintained, he had satisfactorily established it to be a part of the custom of the country that the liability to landshare on leaving depended on the enjoyment of landshare in the first year of his tenancy. As regards the first point contended for, I think it quite impossible that it can be established. For how does the custom of the country operate on contracts of letting? It annexes to the specified terms of the agreement all those well-known usages and customary rights and incidents affecting the occupation of land which universally prevail in the district, and which, it is to be presumed, were tacitly assumed by the parties as forming part of the contract. And as the owner of a farm cannot remove it from the district in which it is situate, so neither can he prevent those with whom he treats for the letting of his farm from silently importing into the contract the established usages, unless he excludes those usages by express terms. But the second proposition appears to me much more worthy of consideration, and open to doubt. It is to be observed that the defendant had no right whatever to an away-going crop, except under the custom. Whatever share of the crop, then, the custom gave him, he was entitled to take, and no more. If it was part of the custom that the incoming tenant should have a landshare, he was bound by his contract to leave one; but if, under the circumstances, the custom gave the incoming tenant no such right, but gave the defendant the whole of the crop, then, by the contract, the defendant was entitled to the whole. Again, it is not to be denied that it was more consonant with justice that the defendant should take the whole of the away-going crop, rather than leave a landshare for the plaintiff; for it is only reasonable and fair that the tenant should quit on the same terms as he entered, and that he should enjoy as many entire crops of wheat as there were years in his term. This proposition would hold, whatever might be the length of the term; but in a case like the present, where the demise was only for two years certain, the depriving the tenant of one-third of a year's crop, when he had only held the farm for two years (if the tenancy had then been determined (and the plaintiff would in that case have had the same right to demand a landshare as at present), would have appeared to work a comparatively greater hardship than when he has held the farm for a much longer time. What, then, is the existing custom? Did this landshare invariably form part of the original custom—or was the right to it from the first uncertain, and dependent on the fact of the outgoing tenant having enjoyed it on entering? Or, again, has there sprung up in comparatively recent times such a usage as is contended for by the defendant, modifying the more ancient custom, and yet so general as always to be received and acted upon where the circumstances exist to which it applies? And, as a matter of law, can a usage be admitted which thus modifies a more ancient usage, or rather limits its application, when the more remote usage has become so general as to be presumed to influence people in their contracts, and to be tacitly recognized and acted upon when they contract? These are the questions which, it appears to me, to be necessary to answer before I can determine whether the defendant has established a good defence under the custom of the country. The manner in which the custom of the country operates on contracts such as this is thus explained by Baron Parke, in delivering the judgment of the Court of Exchequer in "Hutton v. Warren," 1 M. and W., 479: "It has long been settled that, in commercial transactions extrinsic evidence of custom and usage is

admissible to annex incidents to written contracts in matters with respect to which they are silent. The same rule has also been applied to contracts in other transactions of life, in which known usages have been established and prevailed; and this has been done upon the principle of presumption that, in such transactions, the parties did not mean to express in writing the whole of the contract by which they intended to be bound, but a contract with reference to those known usages. Whether such a relaxation of the strictness of the common law was wisely applied, when formal instruments have been entered into, and particularly leases under seal, may well be doubted; but the contrary has been established by such authority, and the relations between landlord and tenant have been so regulated upon the supposition that all customary obligations, not altered by the contract, are to remain in force, that it is too late to pursue a contrary course; and it would be productive of much inconvenience if this practice were now to be disturbed." Mr. Justice Coleridge, in delivering the judgment of Q. B., in *Brown v. Byrne*, 3 Ellis and Bl., 715, says: "In all contracts as to the subject matter of which known usages prevail, parties are found to proceed with the tacit assumption of these usages; they commonly reduce into writing the special particulars of their agreement, but omit to specify those known usages, which are included—known as of course—by mutual understanding: evidence, therefore, of such incidents is receivable. The contract, in truth, is partly express and in writing, partly implied or understood and unwritten." In *Lord Hood v. Kendall*, 17, C. B. R., 269, Mr. Justice Willes, in his summing up to the jury said: "Then there is a further question, viz., whether there is any custom of the country affecting the position in which the tenant stood. And here it must be observed that it is not the mere practice which prevails with regard to a particular estate that will make custom of the country; it must be an usage generally practised and adhered to—so general, in fact, as to be ordinarily known and acted upon throughout the country, and understood to form an ingredient in every bargain, without express and particular reference to it." Such being the best judicial explanations of what is meant by "custom of the country," it would seem to be necessary to its validity that it should be reasonable, certain, and of universal application, except when excluded by express contract; for what is either unreasonable or uncertain, or what only prevails partially or in particular instances, cannot be presumed to have been tacitly assumed by the parties to the contract—the want of those qualities rendering it necessary to inquire whether the custom applies or not to the subject of the contract. I therefore conclude that the custom as set up by the defendant could not have formed part of the original custom; that, if there be such a customary right as landshare—and it is admitted that there is—one must be able to allege with respect to it that the custom gives it to the incoming tenant in all cases, and not that it applies in all cases, except where it does not; or, in other words, in some cases, which can only be ascertained after inquiry. But, if I felt there was no inconsistency in saying that the custom, as set up by the defendant, was part of the original custom, I should be inclined to conclude from the evidence adduced that it owes its origin to the very general desire of the landowners to abolish the landshare, and that it is of comparatively recent growth. But it was submitted by Mr. Price that, if this be so, it would not invalidate the custom; and he quoted *Woodfall* to prove that it is not necessary that it should have existed immemorially, p. 505, 5th ed. It will be observed that none of the authorities which I have before referred to mention immemoriality as a necessary ingredient to make such a usage binding; and, besides the case of *Senior v. Armytage* quoted by Wood-

fall, there is the very recent case of *Griffithshoof v. Daubuz*, 4 El. and B. 230, to show how short a time it requires for a usage to prevail with regard to farming contracts to be recognized by the Courts. In that case it was a question whether the landlord or tenant was bound under the circumstances to pay the tithe rent-charge due on the 1st October after the expiration of the tenancy, the tenancy ending at Michaelmas; and it was proved that it was the usual course in that part of the country where the farm was situate for the tenant quitting to pay, and Lord Campbell, in giving judgment, says: "The tenant, by the contract as explained by the usage, was certainly bound to pay." Now, the Tithe Commutation Act was only passed in 1836, and few commutations were perfected before 1840. Here, therefore, was a usage which could not have prevailed extensively more than ten or twelve years, and yet recognized by Lord Campbell as affecting a written contract. It must, therefore, be conceded that it is no objection to a usage of this kind that it has not immemorially existed; but still it must be general, or it can have no effect. It was, undoubtedly, proved by the defendant that the right to landshare had been done away with to a very great extent, and that, so far as the experience of his witnesses went, it was the invariable practice for a tenant, who had no landshare on entering, to have none on quitting; and I should be inclined to hold that the customary right to landshare was now restricted to those cases where the offgoing tenant had taken a landshare on entering, if I thought, in point of law, that the ancient usage might be thus narrowed or modified by a more recent usage. But I am of opinion that this cannot be; that a recent usage cannot be admitted, which contradicts a more ancient one, unless, at least, the earlier one falls into desuetude—that they cannot co-exist together; and that, as the customary right of landshare is admitted, there cannot be at the same time a customary exemption from landshare. There is another objection which, though perhaps not fatal to the custom set up by the defendant, tends to show its unreasonableness. It often happens that a farm is held by the same tenant, or by him and his ancestors, for a great number of years; so that what took place, in point of fact, at the commencement of the tenancy is either only known to himself or not known at all. Now, if such a tenant, on quitting, alleged that he and his ancestors had no landshare on entering, how is it possible to ascertain the truth of his allegation? No doubt he would be called upon to establish the fact if the incomer brought his action. But is it reasonable that the incoming tenant should thus be driven, of necessity as it were, to his action to ascertain what his rights on entering are? for, I take it, it is not pretended that the alleged custom would deprive his successor of his landshare unless he, on entering, yielded to a *rightful* claim. The alleged custom, therefore, appears to me highly objectionable, as introducing uncertainty, and encouraging the assertion of unfounded claims. But, without resting at all on this objection, I conclude, for the reasons before expressed, that the defence on the part of usage has failed; and as the defendant was fully aware of the existence and effect of the special contract under which Mr. Ellway was entitled to the whole of the away-going crop, at the time when he executed the lease, it seems to me that he could only insure himself the enjoyment of the same advantages at the end of his term, by having a clause to that effect inserted in the lease; and that, as this was not done, the declaration of the plaintiff, that the landshare was "at an end"—though it in effect imported that the defendant should at the end of his tenancy enjoy the whole of the away-going crop—did not bind him in law, or afford the defendant any ground of defence in this action, the position of the defendant not having been in any way altered, nor his

legal or equitable rights affected, in consequence of the declaration. As regards the alleged trespass for breaking the locks and entering the fields to carry away the crops, it is clear, from the cases of *Beavan v. Delahay*, 1 H. Bl. 5; *Boraston v. Green*, 16 E. 71; *Knight v. Bennett*, 3 Bing. 366; and *Griffiths v. Puleston*, 3 M. and W. 353, that the defendant was no trespasser. But it will suffice to quote the language of Baron Parke in the last of these cases. He says: "The outgoing tenant remains in possession until all is done which he has a right to do in respect of the away-going crops; not merely until the cutting. The case of *Beavan v. Delahay* is a strong authority to show that his interest amounts to a possession, and not merely to an easement." There will, therefore, be judgment for plaintiff for the value of the landshare, and I assess that value at £21 8s. 7d.

POUND BREACH.—RESERVED JUDGMENT.

NEWPORT, Friday.—Before J. M. HERBERT, Esq., County Court Judge.

GEORGE WILCOX v. JOHN ROBERTS.—The plaintiff is the keeper of a public pound, and Mr. Lloyd, of the King's Head, having impounded a horse of the defendant's, damage feasant, in the plaintiff's pound, it remained there for three days; but on the night of the third day it was taken out of the pound by some one, without the leave of the plaintiff, and was afterwards seen in the possession of the defendant. Mr. Lloyd told the plaintiff to demand 10s. for the damage. The plaintiff's fees as pound-keeper amounted to 1s. 8d., and he had supplied the horse with food to the value of 8s.; and this action was brought to recover the sum of 19s. 8d., the amount of these three items. It is quite clear that the plaintiff has no claim for the damage done to Mr. Lloyd. It is also clear that he cannot recover his fees by action. The proper remedy would have been an action for the pound-breach; but this action would only lie at the suit of the distrainer. The mode of supplying cattle in a public pound with food, and of recovering from the owner the value of the food so supplied, is regulated by the 12 and 13 V.c., c. 92, ss. 5 and 6, and 17 and 18 Vic., c. 60, s. 1. The first of these statutes, s. 5, enacts that the distrainer shall provide and supply, during the confinement, a sufficient quantity of fit and wholesome food and water to the animal impounded, subject to a penalty of 20s. for default in providing such food; and s. 6 empowers any person whomsoever to enter any pound where an animal is impounded, and to supply fit and sufficient food and water during the confinement of the animal, without being liable to an action of trespass; and the reasonable cost of such food and water shall be paid by the owner of such animal, before such animal is removed, to the person who shall supply the same; and the cost may be recovered in like manner as penalties may be recovered under the Act—that is to say by an order of a Justice of the Peace. The last Act enacts that the impounder, who has provided the animal with food and water, may recover from the owner double the value of the food and water, in like manner as penalties may be recovered under the former Act; and, instead of proceeding so, for the recovery, he may, after the expiration of seven clear days after the time of impounding, sell the animal openly in the public market, after having given three days' public printed notice thereof, for the most money that can be got for the same, and apply the proceeds in discharge of the value of such food and water, and the expenses of the sale, rendering the overplus (if any) to the owner. The

remedy of the plaintiff, therefore, in the present case, must be that provided by the first of these statutes, viz., by summoning the defendant before a Justice of the Peace; for when a statute creates a right, and provides a specific remedy for the enforcing of that right, the statutory remedy can alone be pursued.—Nonsuit.

NORTH DURHAM FAT CATTLE, POULTRY, AND SONG-BIRD SHOW.

The first show of this society was, considering the difficulties which the committee had to surmount, in every way successful.

The judges for cattle, sheep, and pigs were Mr. James Douglas, of Athelstaneford; Mr. W. Raine, Morton Timmouth; and Mr. W. Duckmanton, Clesby. The show of cattle, although not large in numbers, was of a quality that has seldom been surpassed at any local show in the kingdom. The winner of the first prize in class 1 was a magnificent ox, the property of Mr. John Smith, of Normanby, Kirby-Moor-Side, York. He is an animal of great constitution and immense substance, but is deficient in levelness at the top. He is exceedingly massive, and carries a large amount of heavy flesh. The second prize in the class was awarded to Mr. Richard Swan, of 44, Eldon-street, Newcastle-on-Tyne, for an uncommonly fine steer, of good frame, and well finished, bred by Sir Matthew White Ridley, Bart. This animal showed a good deal of the true characteristics of the Shorthorn breed, was more level on the back than the winner, but in other points was not up to the mark of its successful competitor.

In the second class, for the best shorthorned steer not exceeding three years old, the winning animal, exhibited by Mr. James Stewart, Newmarket, Aberdeen, was greatly superior to anything in his class. He is a very excellent animal, two years and ten months old, and would do well to be kept on. The steer which took the second prize (the property of Mr. J. Outhwaite, of Bainesse, near Catterick) was a good useful animal, but too flat in the ribs—in some other respects, also, he was not quite up to the mark.

But the "gem" of the show was "Beauty's Butterfly," a beautiful white heifer, aged two years and ten months, the property of Colonel Towneley, bred by himself, but from a cow descended from Mr. Booth's stock. Her dam "Beauty," we believe, won the first prize in her class at the Royal Show at Lincoln. She was got by "Master Butterfly," is a most perfect specimen of a shorthorn, and was an object of universal admiration. She obtained the first prize in her class, was selected by the judges as the best animal in the yard, and received the silver cup presented by Lord A. Vane Tempest.

She's long in her face, she's fine in her horn,
 She'll quickly get fat without cake or corn,
 Hurrah, hurrah, for this beautiful cow!
 She's clean in the jaws, and full in the chine,
 She's heavy in flank, and wide in her loin;
 She's broad in her ribs, and long in her rump,
 A straight and fat back, with never a hump,
 Hurrah, hurrah, for this beautiful cow!
 She's wide in her hips, and calm in her eyes,
 She's fine in her shoulders, and thin in her thighs,
 Hurrah, hurrah, for this beautiful cow!
 She's light in her neck, and small in her tail,
 She's wide in her breast, and good at the pail,
 She's fine in her bone, and silky of skin,
 She's a grazer's without, and a butcher's within.
 Hurrah, hurrah, for this beautiful cow!

In Class 4 the prize was justly awarded to Mr. W. Wilberforce, the Hermitage, Stockton-on-the-Forest, York, for his Shorthorn cow, aged 4 years and 7 months. She was a re-

markably good animal, of immense substance, and carrying a great amount of flesh of good quality. Col. Towneley received the second prize with a fine animal, showing a good deal of the Shorthorn character. She is from a cow of Mr. Booth's, named "Madeline," but was in the present instance over matched.

The animals shown in Class 5 for the best pure-bred or cross-bred steers not being Shorthorns, were remarkably good. The winner, which attracted considerable attention, appears to be a cross between a Scotch cow by a Shorthorn bull. His substance was extraordinary, his quality of flesh excellent, and he might fairly be considered the third-best animal in the yard.

In Class 6, for the best pure-bred or cross-bred heifers or cows not being Shorthorns, the first prize was awarded to Mr. James Stewart, New Market, Aberdeen, for a cross between a Shorthorned bull and an Aberdeen cow, aged 3 years and 8 months. Sir Walter Calverley Trevelyan, Bart., received the second prize in this class for a heifer with good fore-quarters, but weak in the back and not well finished.

The prize in the seventh class, for the best heifer or cow of

any polled breed was carried off by Mr. Thomas Lund, of Monk Bar, York, with a remarkably fine animal only 2 years and 7 months old. She wants size, but is of good quality, and will make excellent beef. If she had not had wonderfully fine points about her she would have had little chance with her competitors, some of which were more than twice her age. A Scotch polled heifer exhibited by Sir W. C. Trevelyan, Bart., was a good thick animal, but so wild that no one durst approach her. There were only two competitors in Class 8. The animal which carried off the prize, exhibited by Mr. Stewart, of Aberdeen, is a beast of which a good deal more might be made. Classes 9, 10, 11, were represented by fair good animals.

Although there were 25 pens of sheep, they were not a first-rate exhibition. There was an exceedingly good show of pigs, numbering no less than 33 pens.

The dinner of the society was held in the New Town-hall, Lord A. V. Tempest, M.P. in the chair.

—Abridged from the *Durham County Advertiser*.

THE RECENT PROCEEDINGS OF THE SMITHFIELD CLUB.

Like a coursing party, "mad for a minute and dull for an hour," the Smithfield Club is very busy for a week, and very quiet all the rest of the year. The proceedings of this last anniversary have been more than usually interesting; and it may so be not impolitic again to refer to them, while we have still the opportunity, and they are yet comparatively fresh in the recollection of the public. We would dwell here not so much on the merits of the Show itself, as the several propositions for its future management and advancement. The very number of motions on the agenda list spoke well for the vitality of the Society. What the Smithfield Club has especially to guard against is the mere routine of self-satisfied success. It must strive even to do more than it has done, and not continually fall back upon precedent for everything it attempts or accomplishes. In a word, it requires more new matter and new blood; and one will always conduce to the other. The more practical men that are invited to take an active part in its administration, the more likely is its improvement, even in the numerical strength of its members. It has been the fashion of ringing the changes on Brown, Jones, and Robinson—Robinson, Brown, and Jones—that has caused the Club to be considered rather as a close borough, and brought the majority of agriculturists, like all the rest of the world, just to pay its shilling and see the Show, and to think nothing more about it.

It was, then, with much satisfaction that we saw a notice from one of the stewards of the yard for increasing the number of gentlemen in authority. Mr. Sandlay, himself a most active officer and eminent breeder, proposed—"That, in consequence of the great additional labour incidental to the increase of the Show, it is necessary that three more judges be appointed"—and he carried his motion. Even in the list for this year there were one or two new names whose addresses were by no means so readily at our fingers' ends. We

would counsel the Club to follow this up, and, in the time now required, to endeavour as much as possible to find a few fresh faces. It would be our last object to offer any disparagement to those who have officiated so often and so well; but it is in every way advisable to have more tried men to fall back upon. Moreover, a new judge may work on to a new steward, or *vice versa*; and certainly, the greatest mistake or most unpopular proceeding, of late, has been to ask members who have already had three years of duty to take upon them another such a round. We somewhat question, too, whether we have not got beyond the times when a steward should have the appointment of his successor. Such a plan might have been all very well when the direction of the Club was necessarily limited, and agriculturists, as a rule, loath to aid even their own interests in public. At present, however, the reverse is the case; and we would put it as a grand principle of action, that the more power you give to the general body of your members, the more members will you be likely to have. The weak place of the Smithfield Club is that it has so few.

Another point touched on at the recent meetings of the Club would not seem so easy of improvement or solution. In the game of definitions we have always had two standing difficulties—What is a gentleman? and what is a thorough-bred horse? Mr. Beazley adds a third, and asks the Club to say what is a pure-bred animal? The latter has "given it up," perhaps a little too hastily. A committee might surely furnish us with some leading principles or rules to act upon—long wanted for the guidance of judges and similar societies, and that could not come so appropriately from any other body. Indeed, if such information be ever supplied us from elsewhere, it will be simply because the great national Club has omitted to do so. The motion, too, was the almost inevitable sequence of what occurred at the Show of last year. Whether Mr.

Heath's ox were pure-bred or not, the Club hardly went the best way to settle such a question. To pass an animal as pure by simply looking at him, argues an amount of confidence that few would be inclined to trust to, and that none but those who exercised it did in this instance. Again, in the entries of last week there were animals exhibited and prize-winners amongst the pure breeds, that were strongly suspected to have a very recent cross in them. Mr. Beazley, with a committee for consideration and inquiry, might have done much good.

The age of a pig would appear to be becoming a more momentous question than even that of a horse or a lady. All the trickery of this kind has evidently not been confined to the turf. The great agricultural meetings have had their Running Reins and Leanders. According to a humorous and well-applied illustration of Mr. Gibbs, "formerly one might have fancied that some of the exhibitors had taken a lesson out of Captain Marryatt's 'Midshipman Easy,' where a negro was represented as acting as if he thought the chief thing he ought to pay attention to was the filing of his teeth." With the knowledge of this, and the attainments of Professor Simonds, the motion of Mr. Jonas Webb was strongly called for, pointed as it was by something of an example in this very show. It is, indeed, difficult at times to understand how men of the high character we see occasionally condemned for this offence should have permitted such practices. But the world is commonly charitable enough to put the blame on their servants, just as it does in the trimming and squaring of sheep. We shall want some such a similar resolution, ere long to meet this bit of chicanery. Will Mr. Webb be kind enough to bear it in mind?

Taking the age of cattle is another point worthy of consideration, and we know some eminent breeders who would go with Mr. Batson against the first of January generally, and for other breeds as well as Herefords. Mr. Badham backed out of his motion as to the absurdity of showing cows in-calf as fat cattle. It is said

the feeling generally would have been against him, as the majority of heifers exhibited are in-calf. Whatever may be the fact, the practice is a direct contradiction to the declared object of the Club. When we saw the prize cow of last year go home again to calve, and remembered how we had seen her shown in just about the same condition in the summer, the very natural question that suggested itself was—Which, if you please, Sir, is the breeding and which the feeding cow? It is this close association of the two states that leads to so much abuse.

We entered last week at some length on the chief motion of the two meetings—the practicability of obtaining a more commodious place for holding the show; and we must now await the inquiries of the committee. The conduct of that just held in King-street has since been somewhat criticised as to the admission of affected animals. We believe a great deal more has been made of this than was in any way warranted. For the future, it may be as well for the stewards to at once remove any suspected beast; while it was certainly not prudent to readmit Mr. Brown's heifer, considering the state she was in. Travel and excitement only conduce to the development of disease, and an invalided animal could but be expected to get worse and worse in such a crowd and atmosphere as that of the Baker-street Bazaar.

On the whole, we can heartily congratulate the friends of the Club on the increased activity and watchful spirit it has recently evinced. To further this, people must be encouraged to suggest and participate in promoting its advancement. With a national object and influence, its active supporters cannot be too widely spread. Let it therefore be a care to mark out districts with which, so far, the office-bearers of the Society have not been identified. If a steward is still to name his successor, let there be a byelaw that it shall be some one living at least a hundred miles from him, and who has never served before. There are plenty of good men ready to take their turn if they are only asked to do so; and "the more the merrier" might even make the dinner a little more lively and attractive.

CHRISTMAS WEATHER.

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

To what bright and sunny thoughts do the words "A happy Christmas!" give rise! Of the blazing yule log, handed down to us from Saxon days; of the family gatherings around smoking turkeys and stout plum puddings, right able to withstand the shock of hungry holiday-keeping youths. Long, long may these truly national assemblages flourish, with increasing comfort and warmth to English homes! And on one of these cosy gatherings, as we sit around our fire, we may not spend our time unprofitably if we just (without turning out into the snow or the thick chilling fog) take a thoughtful

turn round our homestead, and see how our live stock are spending *their Christmas*, and bestow a thought or two upon the useful inquiry, Can we make these or our dependants more comfortable?

We have reason to be hearty in this little question. Our pockets are concerned here, our balance at the bankers may be influenced by these observations, especially if we do what many persons do not, feel convinced that something good *is* to be done, and yet never make even an attempt to do it.

While I am saying these things a dense cold winter fog encircles everything around me: these fogs

have, in fact, been more than usually prevalent at this season of the year. Every one knows their chilling influence. We not only feel it ourselves, but we notice it in our shivering farmyard live stock. The fog not only surrounds and carries off the animal heat from us on all sides, but it is often an impure moisture. We need not allude to the smoke-surcharged fogs, of densely-populated places; it is apparent enough to the very senses there; your eyes smart in a London fog (it is of a mellow reddish-yellow colour); you taste it there. But even in country places the water of fog is more impure than that of rain. Professor Anderson, when sketching (on a recent useful occasion) the progress of scientific agriculture (*Trans. High. Soc.*, 1858, p. 397), alludes to the labours of a celebrated French agricultural chemist to determine the comparative amount of some of the foreign substances found in rain, fog, and dew waters. M. Boussingault directed his attention to determining the amount of ammonia and nitric acid not only in the moisture of fogs and dews, but in rain-water under different circumstances; and he has shown that the proportions vary within very wide limits at different times. As a general rule the water of dew, and still more that of fogs, is richer both in ammonia, and in nitric acid than rain-water, unless we compare it with the first drops of rain falling during a shower, and which for obvious reasons must contain a large quantity. The abundance of these substances in fog-water is remarkable. Thus Boussingault found that a million parts of rain falling in Alsace contain 0.6 of ammonia, and 0.2 of nitric acid; but in the moisture of a particular dense fog which occurred in Paris on the 23rd of January, 1854, there were no less than 138 parts per million of ammonia; and on another occasion in the country, about a third of that quantity; and on the 19th of December, 1857, a fog was examined which contained 13 parts per million of nitric acid. The following is a tabular statement of the quantity of ammonia and nitric acid found in meteoric water under different circumstances. The numbers express in grains the quantity per imperial gallon:

	Ammonia.	Nitric Acid.
Rain . . .	{ Paris	0.2100 0.0708
	{ Liebfrauenberg	0.0350 0.0140
Dew	{ Maximum	0.4340 0.0785
	{ Minimum	0.0714 0.0030
Fog	{ Paris	9.6000 0.7092
	{ Liebfrauenberg	0.1790 0.0718

When we conclude that the protection of our domestic animals from cold and wet (which moisture renders our stock still colder) tends to our profit, we have the testimony on our side of all the leading practical farmers, and of men of science too. "I have no faith in the idea which I have sometimes

heard expressed," observes Mr. Edward Bowly, of Siddington, in his recent valuable prize essay on the management of breeding cattle (*Jour. Roy. Ag. Soc.*, vol. xix., p. 147), "that 'roughing' calves (which means exposing them to cold and hunger) makes them hardy. On the contrary, it has the effect of weakening their constitutions; and this system pursued towards the young stock for two or three generations will ruin the best breed of cattle in the country: the offspring after this time will have lost all the quality, early maturity, and propensity to fatten of their ancestors, and it will require years of the greatest care to recover what is thus lost. On the other hand, it is very injurious to force young animals, although it may be necessary in those individuals which are intended to compete for prizes. The tendency of such a system is to curtail their usefulness as breeding animals; for, though most of them so forced will breed, there is of course more risk in calving them, their milking properties are greatly lessened, from those vessels intended by nature for the supply of milk being coated with fat, and they decay prematurely, and have all the marks of age upon them at seven or eight, whereas I have bred from cows not so forced up to twenty-two years of age. Nor is there any real reason for forcing show-animals; for judges can fully appreciate the merits of cattle without their being so extremely fat as breeding-stock are now exhibited at nearly all our shows." And when speaking, in his prize essay, of the management of sheep (*ibid.*, vol. viii., p. 30), Mr. R. Smith, of Exmoor, after giving the result of a variety of experiments upon their food, sums up the results with the observation that it will be found that *warmth* is proved to be an important feature in sheep husbandry, and is, in fact, a subject affecting the rural economy of the whole nation. Taking the average temperature of a sheep's body at 100 degrees, and the average temperature of our climate to be 60 degrees, in every respiration and inspiration of air the animal loses by the *exchange* animal heat equal to 40 degrees, which if not supplied by the elements of food or artificial warmth, the animal would cease to exist. Thus, when the temperature of the animal body is below the *standard* of heat, it requires a proportionate artificial warmth to economize the vegetable food."

The dairy suffers too, by the exposure of the cow to low temperature. It was in his elaborate paper on the milk-producing gland (*ibid.*, vol. xix., p. 101) that Professor J. B. Simonds had occasion to remark, when speaking of the effect of temperature, that the injurious result of the extreme heat of summer, or of the cold of winter, over the animal functions, requires but little exemplification. Cows exposed to either suffer in their lactation,

A highly elevated temperature, by keeping an animal in a state of excitement, often produces functional disorders of the liver, which lead to diarrhoea and a consequent diminution in the secretion of milk; while the opposite state of the atmosphere, by depressing the vital functions, has a similar result. Notwithstanding this, an animal has the power of maintaining a uniform heat of its body under any circumstances it may be placed in, with regard to temperature. This heat, which is equal to about 100° of Fahrenheit, is, however, kept up with less tax on the system under some circumstances than under others. As a general principle a greater demand is made on some of the elements of the body in *cold* than in warm weather. It is principally by the union of the oxygen of the atmosphere with the carbon and hydrogen of the system, and the consequent production of carbonic acid gas and watery vapour, which takes place in the capillary vessels of the entire organism, that animal heat is produced. The carbon and hydrogen are thus being constantly consumed, and to supply their place the hydro-carbonaceous materials of the body are appropriated. By the process of respiration oxygen enters the system; and by the same process the carbonic acid and watery vapour are cast out. Cream, as we have elsewhere stated, consists chiefly of the oleaginous or hydro-carbonaceous elements of the milk, their source being the food; but if these are consumed while still in part within the blood to keep up the heat of the body, it follows as a consequence that a diminished amount will be found in the milk. Protection from the cold and inclement weather of winter thus becomes indirectly the cause of supply of a given quantity of food, and the same protection is no less beneficial in allaying undue excitation during the heat of summer.

The owners of stock on the Continent seem well aware of the advantages of warmth. In the Netherlands, where the cows are housed during the winter months, they can suffer little from cold; they are brought into their winter quarters in November, and are put out to grass in May if the weather is mild. When first the cows are let out into the meadows, a piece of coarse cloth is put over their

loins, and tied round their bodies, to prevent the injurious effects of cold dews and fogs: this is discontinued when the air becomes warmer. In all Northern Germany too, and in Holstein, the cows are as warmly winter-sheltered, or more so than in the Netherlands. In Holstein the housing of the cows requires very extensive buildings; for there the herds are large, and in fact their dairies are "the glory" of the intelligent Danish farmers.

The advantage, indeed, of adapting the circumstances in which our animals are placed to the changes of the seasons need hardly be enlarged upon. The winter coats of our horses (which are barbarously clipped off), and many other natural phenomena, tell us the necessity of the same thing. The very worm we tread upon seeks a warmer habitation as winter approaches; he then dives down into deeper and warmer chambers, and again approaches the surface as the season becomes genial. We may thus take a hint from very "humble creatures"*; and if at this merry season we just give a few minutes to the consideration of how those patient cows—those shivering pigs can be made a little more "comfortable," we may perhaps accomplish something worth while by even small efforts, that would not sound very important in print. The extension of a haulm wall—a better closed window or door—a transfer at night to a warmer shed during comfortless snows and fogs—a little variation in the food, or a warmer bed—might be sensibly felt even in the dairy. And when we are considering our herds and flocks, assuredly it would be a kindly act to remember that the herdsman and the shepherd have also little flocks at home of their own, who *might perchance*, by some kind little act or word of advice and *thoughtfulness*, be also rendered warmer and drier. At any rate, it gives little trouble and less expense on our part to "just see to this"; the very pleasure of trying to do it is an ample reward, I know full well, to all those to whom I care to address myself; and in any event, the mere *attempt* to give comfort will certainly not render the glorious season of Christmas less joyous, either in the house or in the homestead.

THE ADVANTAGES OF WINTER PLOUGHING.

The season of the year has now arrived when the majority of our farmers are far advanced, or are rapidly progressing, with the important operation of ploughing-up the land for the winter. With general consent, this system has been accepted and adopted with very advantageous results; but there are some districts in which greater attention to the practice will

be productive of much benefit, and we therefore feel it important to draw attention to it. The soil, like all other matter, needs a period of renovation after it has

* "Humble Creatures" is the title of a nice little 3s. 6d. volume on the worm and the house-fly (all Van Voorst's books are, in fact, good), by Samuelson and Hicks, just published.

been discharging its duties for a certain period of time. It was once very generally believed that plants threw off certain excrementitious matters, in the same manner as animals do; and that such matter was very prejudicial to the luxuriant growth of the plant producing it, as being not simply useless for the nourishment of the plant, but positively injurious. With such an opinion, it became very easy to see the advantages derived from exposing the soil to the atmosphere; and it was consequently assumed that the air, by promoting the decay of such excrement, purified the soil, or, as it was usually termed, "sweetened it," and thus it again became fitted for producing the same crop. The advances which have been made in our knowledge of the growth of plants, whilst they make us cautious in rejecting such an opinion entirely, certainly lead us to modify the views originally entertained. Consequently, our ideas respecting this purification of the soil from excrement have undergone considerable change. Instead, therefore, of tracing to the plant the power of throwing off this excrementitious matter, it is now believed that the decay proceeding in the soil produces matter which, in some of its stages, is uncongenial to the plant; and, when such is the case, the admission of air into the soil becomes desirable for sweetening the land, not from any excrement which the previous crop may have thrown off, but from the vegetable acids which are formed in the soil from the decay of vegetable matter. If this organic matter should be abundant, there is the greater opportunity for the production of these vegetable acids in the soil; if it be deficient, then there is less opportunity for their formation. The natural inference is that, if we are dealing with a soil rich in organic matter, either naturally or from the use of manure, it becomes the more desirable that it should be freely exposed to the air, so as to keep it in a healthy condition. The atmosphere of the soil is almost as influential upon the plant as the atmosphere above the soil. If it becomes foul and unhealthy, the plant cannot luxuriate as under more congenial conditions.

The organic matter of the soil, which demands these supplies of fresh air, needs it to perform those alterations in its character and condition that will fit the decaying ingredients to change from the organic matter of the soil into such a state that it may be readily transformed—under vital energy—into the organic matter of the crop. This is a transformation which it is necessary for it to undergo, in order that it may be serviceable in promoting vegetable growth. It is of little avail having a soil richly stored with organic matter, unless we allow this matter to become so acted on that it shall be rendered serviceable for the next crop. The free exposure of the soil to the air is therefore very important and essential for the healthy condition of our lands, because it promotes the decay of the organic matter they contain, renders any dung remaining in them ready for the succeeding crop, and develops matter hidden in the land. In fact, whilst it purifies the soil it also enriches it.

But why should this be done during the winter

months? There are many reasons, but the two following will probably be sufficient: The winter is the period of rest—a time when the soil is not employed in the production of vegetable growth, and therefore we may employ it advantageously without interrupting the production of any crop. Another reason is, because the soil becomes more completely acted upon at this time of the year than any other; and hence the action is rendered more perfect. This arises from various causes; but of these the influence of temperature is the most important. The exposure of the soil to the rain causes it to become thoroughly permeated by the water; when the frost sets in, this water becomes frozen, and the frost, as it were, creeps into the soil, binding its particles together like portions of rock rather than soil. But when a change of temperature follows, the hard and rock-like clods crumble beneath its influence. In this manner we get the soil very freely exposed, and this breaking-down gradually lays its hidden stores open to the action of the air, and thus the decaying matter of our soils is changed from its sour and acrid condition into a form ready to enter into the succeeding crop, and minister to its development. It is so we see that the ploughing of the land in order to expose it as much as possible to the influence of the winter air is a practice which advantageously accompanies the liberal use of farm-yard manure. Upon good land it is desirable as far as it can be done, because it develops the fertility which lies hidden within. It also favours the decay of the manure it contains, thereby bringing it within reach of the subsequent crop, and rendering it available for promoting its luxuriant growth.

HOW TO MAKE TWO POUNDS OF MEAT UPON POOR GRASS LAND WHERE ONLY ONE POUND WAS MADE BEFORE.

SIR,—The famed county of Leicester contains some of the finest grazing land upon the face of the earth; and the said fine county contains some very weak poor grass land, which ought to be first underdrained, and then ploughed, and sown with a fair proportion of root and green crops. If not ploughed up, I propose upon this poor grass land to give the cattle and sheep eating the grass upon it a fair quantity of cake per head per day upon it, which would make the said land in a short time produce double the weight of grass, which would keep double the quantity of stock, and at the same time produce double the quantity of strong manure yearly, and double the quantity of meat per acre—nay, and keep fat stock where lean ones were kept before. I have known the above practised 50 years back near Rockingham Forest, where some short-horned oxen ate 10lbs. of oil-cake per head per day, and six Leicester sheep 1½lbs. each of cake per head per day; the oxen gained alive per head per week a stone of 14lbs., or 280lbs. in twenty weeks; the sheep gained alive 2lbs. each sheep per week, or 40lbs. each, or 10lbs. per quarter in twenty weeks. The more cake you give the cattle and sheep the sooner your land would keep double the stock, as the strength of the manure depends upon what it is made of. And the cheapest manure is by converting cake or corn into meat, because when meat is at a high price the manure lays to but little money. As the Lincolnshire Wolds and Lincoln Heath has been by judicious manuring made to produce double the quantity of corn per acre, common sense says that the poor grass land might easily be made to produce double the weight of grass per acre; but the great obstacle in the way is the want of a North Lincolnshire tenant-right *alias* justice between landlord and tenant.

SAMUEL ARNSBY,

Millfield, Peterborough, Dec. 2nd.

CALENDAR OF AGRICULTURE.

During stormy and frosty weather, carry dung from the cattle yards to the heaps in the fields that are intended for next year's green crops. Slope the heaps at the ends, so that the carts can pass along the heap; and spread the strawy excrements evenly over the extent; the treading is intended to prevent the present fermentation. Carry stones for drains, and for walling, and soil to the compost heap, and to the liquid manure pit, where fine earths are used for absorption. Deliver grains to the merchant; carry fuels; and gather all kinds of manure.

In fresh weather, plough stubbles for wheat, and green-crop fallows: on wet lands, open by spade all cuts, to let the water escape into the side ditches. Plough grass leys for Lent crops of grain—all lands are better for being early ploughed; heavy lands are pulverized by the vicissitudes of atmospheric action; and light lands acquire a consolidation from laying a time in a certain position. In the case of light lands, this firmness of the soil has been found of very great value.

The fresh weather of this month affords a good opportunity for cutting hedges, underwood, and copses; for planting young trees; for cutting drains to the half depth, to be afterwards deepened and finished in Summer; and for cleaning water-courses, cleaning the sides of roads, and carrying the materials to a heap for lime compost. Sow wheat on any fallows delayed in Autumn, and on stiff turnip lands from which the roots have been removed.

During mild dry weather, if any happen, continue to pull, and lay in store, Swedish turnips in a heap at the homestead; lay the roots in a longitudinal row, six feet wide at bottom, and four feet high, with sloping sides, and thatch it with straw. Choose a cool situation. Lay in store, in provision against a storm, a quantity of common turnips, sufficient for a month's consumption: keeping beyond that time produces mouldiness.

In every kind of weather never omit to collect manures; a compost heap is indispensably requisite, to which all refuse matters are carried; in a shed under cover, prepare dry manures for the drop drill. Float water meadows, and lay dry occasionally.

Thrash frequently, that the animals may have fresh straws for constant use—for provender in the yards, and for being cut into chaff. Move very often the straw cribs in the yards, that the dung underneath may become of an uniform quality; and litter often the whole area of the

yards thinly and evenly. Bestow the most minute attention on every detail of practice.

Give turnips and other roots to the feeding and store cattle in the yards by break of day, in such quantities as the intended purpose may require, and to be consumed by night, in order to prevent accidents by choking when darkness prevents the observation. Wooden cribs with latticed bottoms allow the mud and water to escape downwards, and answer a good purpose. A few young pigs are very useful to run loose in the yards to pick up the shells and scraps of turnips that fall from the cattle.

Attend most carefully to the milch cows now beginning to drop calf. The secretion of milk must be promoted by juicy food—roots mixed with chaff, prepared by steaming, in at least one meal daily, given at mid-day. Suckle all calves, either for weaning, or for veal; no substitute has been found for the mother's milk; feed the calves thrice in a day.

The sheep in the fields will require a very regular attention in feeding and tending. Give the turnips in a fresh state daily, pulled from the fields if possible: early ewes will begin to drop lambs, must have ample feeding with juicy food, and good shelter in covered sheds.

Feed bacon hogs twice a day with steamed roots, as potatoes mixed with meals and bran. The food of brood sows may be thinner and more mashy. Store pigs may have the roots in a raw state, and one feed of cooked food daily. Bacon hogs are finished in the last month of fattening by eating hard corns, as beans and oats. This food produces whiteness and firmness in any flesh.

The poultry must not be neglected. Feed with light grains, and steamed potatoes mixed with meals, and given in troughs placed in a covered shed. Poultry houses should be heated underneath the floor by hot water pipes from the cooking boiler. By this means, the hatching of chickens may go on during winter.

The foremost fattening bullocks, and the early bacon hogs will come into sale during this month, and will command a ready market at this early season. Such articles being scarce, a higher price is obtained. This circumstance should stimulate the farmer to have all things as much in advance as possible.

Work horses are much benefited by one feed daily of steamed potatoes or other roots, given in the evening when they return from work.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR
DECEMBER.

Although rather large quantities of rain have fallen in most parts of the United Kingdom since the close of the previous month, the want of adequate supplies of moisture is still complained of in some of our leading districts. However, on the whole, out-door farm labours are, for the most part, seasonably forward, and the young wheats are looking strong and healthy. We are again compelled to write in the same dull strain, as respects the wheat trade, as for many months past. Great disinclination has been shown on the part of the millers in the purchase of wheat beyond immediate wants; nevertheless, the downward movement in the quotations appears, at length, to have received a check, and some parties in the trade have expressed their opinion to the effect that we shall shortly have rather excited markets, and that, as a consequence, the quotations will have an upward tendency. Without positively endorsing this opinion, it may, we think, be taken for granted that the value of wheat has seen its lowest range, and it may be fairly argued that the absence of extensive importations from abroad during the next three months may enable present holders of foreign to dispose of the enormous supplies which have accumulated in the London warehouses; but against any important rise in prices, we have to notice the important fact that our farmers continue to hold heavy stocks of wheat, both new and old, and, further, that the secondary articles of consumption—such as potatoes, rice, &c.—are, from their great abundance, still coming into direct competition with wheat; nevertheless, a very little excitement in the trade would doubtless be followed by extensive purchases on the part of the millers, who now hold much smaller supplies of grain than has been known for many years past. We observe that in some quarters there is a disposition to attribute the present depressed state of the trade to a falling off in the consumption of bread; but a comparison of the sales of English wheat effected this, compared with last year, shows that the transactions have been *considerably* in excess of 1857; and when we bear in mind that the trade and commerce of the country are rapidly recovering their former position, and that the whole of our operatives are in full employment, we can hardly assume that the future range in prices will exhibit any adverse movement as regards the agricultural body. And here we may further remark that the consumption of meat, since quite the commencement of the year just concluded, has been enormous. Everywhere prices have ruled very high, although the importations from the continent have not exhibited any important decline compared with 1857. Throughout France and Germany a large quantity of wheat is still in stack, and the growers have continued to press sales, even at further reduced rates; but in the United States, owing in some measure to a reduction of 30 per cent. in the import duty on American flour in Brazil, the trade has ruled somewhat firmer. The shipments of produce to the United Kingdom, since the 1st of September, have been trifling, viz., 71,471 barrels of flour against 338,513 barrels in the same period in 1857; 422,821 bushels of wheat, against 2,566,698 bushels; and 305,685 bushels of maize, against 534,955 bushels. The decrease, therefore, amounts to 267,039 barrels of flour, 2,143,877 bushels of wheat, and 229,270 bushels of maize. This immense falling off in the exports is somewhat significant, and,

in the event of the Liverpool granaries becoming well cleared of their late heavy stocks, it may have the effect of producing additional firmness in the home trade at a period when least expected.

Immense supplies of potatoes, in excellent condition, have continued on offer in the whole of our leading markets. All kinds have met a dull inquiry, at prices varying from 45s. to 100s. per ton. On the Continent, the crop, as with us, has turned out large, and some extensive shipments have been made to this country from France, Holland, and Belgium, although the use of potatoes in distilleries is again permitted. From the 1st to the 27th of the month, about 3,200 tons of foreign potatoes were received into London alone, and we may anticipate equally large quantities both in January and February.

Full average supplies of fat stock have been on offer in our various markets for Christmas consumption. Although the trade has not been to say *very* brisk, good clearances have been effected at high, perhaps we may say remunerative, quotations.

The scarcity of winter food for cattle is still complained of in our midland counties, and not a few of the graziers have been compelled to purchase large quantities of hay to meet actual requirements. This outlay must, as a matter of course, materially reduce profits upon future sales, even though meat may continue to sell at its present high value.

Although the accounts from the manufacturing districts are favourable in the extreme—an immense amount of business having been transacted both in cotton and woollen goods, partly for export to India and China—there has been no important movement in the wool market. Prices, however, have continued very firm, and there is every prospect of higher rates as the new year progresses, as the supplies now in the hands of the manufacturers are unusually small, and as the greater portion of the last clip of English has been disposed of.

The hop trade has continued devoid of animation; nevertheless, prices generally have been supported. The supplies of hops now on hand are larger than for many years past at this time, and nothing short of extensive shipments will relieve the market from the pressure upon it.

We have nothing particularly to notice as regards demand for, or value of, produce either in Ireland or Scotland. The operations in wheat have been limited, at about previous quotations; but fine barley and oats have moved off steadily, at full quotations. The quantity of fine barley produced both here and on the Continent, in the past year, was unusually small, even allowing that the entire crop was a large one; but sales of light parcels have continued to be forced, and the result is that the quotations have run down to a low point. Very little barley is now used in the distilleries in this country for the purpose of making spirit for export to the Continent.

REVIEW OF THE CATTLE TRADE DURING THE
PAST MONTH.

The leading feature of the month has been the holding of the great markets for Christmas consumption. With scarcely an exception, they have been well and abundantly supplied, whether we consider the condition or the weight of the stock brought forward. The trade has ruled decidedly firm, and both beasts and sheep have changed hands at high quotations.

In a comparative sense, the great market held in London was a most superior one, and it was a general subject of remark that the short-horned breed of beasts in this country is rapidly increasing in strength, both as regards number and in the crossings. This is a point of great interest at this moment, and it would appear that apprehensions are current in some quarters that eventually we shall have very few of the old-fashioned, or what are termed pure, breeds—such as Herefords, Devons, Scots, &c.—left in the country. The aim of the breeders of late years appears to have been, to combine weight with improved quality, and the result of the experiment thus far appears to have been successful. It will, however, be watched with more than usual attention, as many persons have long since condemned the system of extensive crossing as fraught with danger to the general stamina of the stock.

A scarcity of winter-food has continued to be felt in some quarters, more especially in our midland counties, and rather large quantities of hay have been purchased from a distance to make good the deficiency.

We have now arrived at the close of the Lincolnshire season for beasts as regards London, and we shall be chiefly supplied from Norfolk during the next six months. In that county the number of beasts in process of stall-feeding is large; and we may fairly anticipate heavy arrivals from that quarter. With average supplies from the Continent, therefore, we see no reason to anticipate higher quotations than those now current. The total supplies of stock exhibited in the Great Metropolitan Market have been as follows:—

Beasts	20,523 head.
Cows	490 "
Sheep	74,274 "
Calves	1,412 "
Pigs	2,450 "

COMPARISON OF SUPPLIES.

Dec.	Beasts.	Cows.	Sheep.	Calves.	Pigs.
1857.....	19,330	375	69,132	1,209	1,915
1856.....	23,995	475	73,200	1,526	2,380
1855.....	22,412	500	94,030	1,376	3,184
1854.....	20,293	120	86,660	1,573	2,746
1853.....	23,314	484	88,480	1,143	2,403

Beef has sold at from 3s. to 5s. 4d.; mutton, 3s. to 5s. 4d.; veal, 3s. 4d. to 5s.; and pork, 3s. 2d. to 4s. 2d. per 8lbs., to sink the offal.

COMPARISON OF PRICES.

	Dec., 1857.				Dec., 1856.							
	s.	d.	s.	d.	s.	d.	s.	d.				
Beef, from ..	3	0	5	0	3	10	5	0	3	4	5	4
Mutton	3	2	5	0	4	0	5	6	3	4	5	0
Veal	3	10	5	6	3	8	5	6	3	10	6	0
Pork	3	6	5	4	3	8	5	4	3	6	5	0

The above comparison shows that pork has sold at ruinously low rates during the past month; but the fact is, that the high quotations realized for them in the three previous years have had the effect of producing a wonderful increase in the total supply of pigs in the United Kingdom. The excess in the supply has been so enormous that the greatest difficulty has been experienced in effecting sales of the immense supplies of pork forwarded to Newgate and Leadenhall markets, at almost any price. Apparently, as much money has been lost this season in the production of pork as was gained in the two previous years.

The imports of foreign stock into London have been on an extensive scale for the time of year, or as follows:—

Beasts	1,980 head.
Sheep	16,929 "
Calves	1,037 "
Pigs	53 "
Total.....	19,099

In the corresponding month in 1857, the total imports were

6,608; in 1856, 11,079; in 1855, 19,515; in 1854, 18,349; in 1853, 21,918; and in 1852, 11,870 head.

The arrivals of beasts from Lincolnshire, Leicestershire, and Northamptonshire have comprised about 9,000 shorthorns; from the West Country, 2,300 Herefords, Devons, Runts, &c.; from other parts of England, 2,450 of various breeds; from Norfolk, 720 Scots and Shorthorns; from Scotland, 1,161 Scots; and from Ireland, 1,450 oxen, &c.

Unusually large supplies of Scotch and country-killed meat have been received up to Newgate and Leadenhall markets, in which an extensive business has been transacted as follows:—

Beef, from 3s. to 4s. 8d.; mutton, 3s. 2d. to 4s. 8d.; veal, 3s. 2d. to 4s. 6d.; pork, 2s. 6d. to 4s. 4d. per 8lbs. by the carcass.

WEST GLOUCESTERSHIRE.

Another year has nearly run its course—a year replete with agricultural interest. From the commencement to the present time the weather has been more than usually favourable for farming operations. A fine winter, succeeded by sharp frosts in March, rendered the soil most remarkably fit for spring cultivation; and it also checked the precocious growth of the autumn-sown wheat. A fine and early spring brought forth the fruits of the earth in great perfection, and a dry summer enabled the careful husbandman to clean his land most satisfactorily. Then came the harvest, with abundant crops, and splendid weather for the ingathering. All the farming operations of the season have proceeded with unusual regularity and promptitude; there has been nothing to impede them. The early harvest has allowed much time for tillage, and a man must have been culpably negligent who did not embrace the advantages of autumnal cultivation. The very small proportion of rain that has fallen on an average during the year, although suitable for most soils, occasioned considerable inconvenience in many parts, from the imperative necessity of procuring it from a distance to supply the stock, involving in many instances considerable expenditures of money. The quantity of cheese made in this district is below an average; it commenced with prospects highly flattering. The grass came luxuriantly and early in the spring, but the dry weather of the summer occasioned a great falling off. The fruit may be estimated at a trifle under two-thirds of a crop, but the deficiency is made up by the quantity of the cider. The root crops are fair, not first-rate; yet there is not much cause for complaint. The dry weather which prevailed during the summer and autumn prevented luxuriant growth, and the mangels have superiority over the swedes. They were nearly, if not all, housed during fine weather; and therefore there is every reason to expect they will keep well. We now come to the all-important provision for another year—the wheat crop. In many places the planting of it was delayed, in consequence of the extreme hardness of the soil; and in some places where it was planted early, it lay in the ground without vegetating, which must be prejudicial to its growth; but we are not apprehensive that this failing is extensive. The artificial-manure mania has come to a crisis, and many intelligent farmers have decided that they can produce good crops without guano. The introduction of lime is extending with good effect, and although it may be pronounced an old-fashioned application, it is nevertheless a good one. The decline in the value of all kinds of agricultural productions can scarcely be said to have occasioned surprise—perhaps we may except the great reduction in the price of wheat; but considering the abundant crops, not merely in the United Kingdom but all over the world, and the extra breadth of land planted with that grain in England, whatever it might have been elsewhere, there could be no reason for supposing it could have maintained the rates of preceding years.

WEST RIDING OF YORKSHIRE.

The month which above all others is characterised by excessive cheerless and gloom has now run its course, and we are now close on the festive season, anniversary of the time when "Peace on earth, good-will to man," was heralded forth by angelic tongues; and how many generations of earth's proud sons, big with the pomposities of vanity, since that

eventful period have been and passed away! "Their name is legion;" and how many associations, delightful and sad, does this season call up to us! How many have gone, to whom we looked with filial and reverential respect, whose ample experience might be a safe guide for our youth, and on the accuracy of whose opinion we always regulated our paths! But the stern destroyer does not hold with the aged and well-stricken in years: the young, the gay, the beautiful are all proper food for his insatiate jaws. How much it behoves us then, who are now spared to "enjoy the festivities of another Christmas, to "join trembling with our mirth!" How many of us may be numbered and marked to fall before another Christmas! For how many the stern mandate has gone forth, "Cut them down: why cumbereth they the ground?" That such an order has gone forth for "numbers is certain; the reverse is sure to none." "Be ye also ready." During November we had our quota of dull cheerless days, a portion of wet, and some severe frost; on the whole an unseasonable month, and favourable for the steady progression of out-door work. Ploughing is well forward, and a goodly proportion of roots secured, which, by the way, are pulling fair crops, and much better than at one time during the summer could have been anticipated. Cattle are all now at winter quarters; but the idea is very prevalent that less than a usual average number has gone to turnips. The trade of late has been better for fat, prime animals making about 7s. 6d. per 14 lbs. Sheep are, and for the last six months have been, a drug on the market. Mutton must certainly be in the dark shade with the million, or sheep-breeding of late must have been more extensively followed. Grain sells at ruinously low prices; and if present rates hold, Halkett's rails cannot be too soon laid over the length and breadth of our district, if the advantages promised in his able paper are at all likely to arise from their adoption. But the great bug-bear in connection with the system is, and will be, the immense capital required. Good wheat can be got at 40s. per qr.; barley, malting from 32s. to 34s.; grinding barley, of which a very goodly proportion in this district this season must be classed, brings 28s. per qr. New oats from 10½d to 11½d. per stone; fresh old oats from 32s to 35s. per qr.—Dec. 23.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

BEDALE FORTNIGHT FAIR.—We had a good show of fat beasts, but a small one of sheep. All kinds of fat stock were in good sale, at the full rates of last fortnight. A small quantity of holding stock sold at late rates. Beef, 6s. 6d. to 7s. 3d. per stone; mutton, 5½d. to 6¾d. per lb.

COMBE ST. NICHOLAS FAIR was well attended by farmers. The supply of all kinds of stock was large, excellent in quality, and met a ready sale, good prices being obtained for the greater part.

KELSO FORTNIGHTLY MARKET.—The supply of fat Cattle was not large, but there were a number of them of good quality. There was a good demand, and all were disposed, at from 7s. to 8s. per stone.

LEDBURY FAIR.—Fat beef was not very plentiful, but what there was was fine. It fetched from 6½d. to 7d. per lb. Fat sheep made 6½d., ewes 7d. A few store beasts were in the fair, which were sold, though the dealers were scarcely willing to give the prices asked.

PENRITH FORTNIGHTLY MARKET.—We had a large show of sheep (upwards of 1,200); a great many, however, were blackfaced, and not well up in condition. For those fit for the butcher a good demand was experienced, at prices a little in advance of last market. In cattle the show was very good. The market closed with a dull tone.

PAIGNTON MONTHLY MARKET was attended by a great number of buyers and dealers, and the supply of stock was large. Beef, of which there was some very prime specimens, is quotable at from 5s. 6d. to 6s. 6d. per cwt., and mutton at 5d. to 6½d. per lb.

SHREWSBURY FORTNIGHTLY MARKET.—The best fat beef sold for fully 6½d. per lb., inferior cows 6d., fat calves 6d. to 6½d.; useful store cattle selling at fair prices, also cows and calves. Fat wether sheep 7d. per lb., fat ewes 6½d.; fat pigs 5d. per lb., stores selling better.

STRATFORD-ON-AVON FAIR was well attended with buyers, and there was plenty of fat stock, the majority

of which was of a very superior quality, and met with a ready sale at first-rate prices. Beef from 6½d. to 7½d. per lb. There were about 800 sheep. Mutton and lamb, best qualities, brought very good prices. Fat bacon pigs brought from 7s. 6d. to 8s. 6d. per score.

YORK FORTNIGHT MARKET.—There was only a thin supply of fat beasts, but the butchers having previously purchased their Christmas beef, the trade was slow, at prices ranging to 7s. per stone. There was only a limited supply of sheep, which were well sold up. In-calvers and milch cows were in good supply, as also grazing stock, but the market for them was heavy. We had a good supply of pigs. Pork pigs were in good demand, at 6s. to 6s. 6d., but bacon ones were heavy, at 5s. 6d. to 6s. per stone, including the head and feet. A large number of Irish pigs were again exhibited, and sold at 5s. 6d. to 5s. 9d. per stone. Pork hams were as last quoted.

COUNTRY POTATO MARKETS.—**YORK, Dec. 18:**—Potatoes sell at 6d. per peck, and 1s. 8d. to 1s. 10d. per bush. **LEEDS, D.C. 21:** We had a large show of Potatoes, which sold at 8d. wholesale, and 9d. retail per 21lbs. **SHEFFIELD, Dec. 20:** Potatoes sell at 5s. 6d. to 5s. 6d. per load of 18 stones. **RICHMOND, Dec. 18:** Potatoes, 2s. 8d. per bushel. **MANCHESTER, Dec. 21:** Potatoes, 6s. 6d. to 10s. per 252 lbs.

IRISH FAIRS.—**BENNETT'S-BRIDGE:** There was only a small and inferior stock of every kind, and any beasts which were of tolerably good quality were readily sold a fair average price; but the amount of business done generally was not large. There were no pigs; but a tolerably good supply of horses met a quick demand, at long prices.—**KELLS** was not so large as was anticipated. The show of beef was on a moderate scale, not being much more than sufficient for the accommodation of the town. Store bullocks were in good demand, at from £7 to £11, and heifers at from £8 to £12 each, yearlings £4 to £5 10s. each. There was also but a moderate supply of sheep, and all were sold. Pigs were abundant, and buyers equal to the quantity present. Prices, however, were not higher, being from 38s. to 40s. per cwt. Porkers sold at from 38s. to 50s. each; stores were in good demand, at from 25s. to 45s. each. There was a fair attendance on the horse green, and brisk business done, at prices ranging up to £40 and £50 each. **MULLAGH-CREW** was a small one, and prices, in consequence of the great competition, ended somewhat higher, prime beef bringing 56s. to 60s. per cwt. The demand for dry cattle was pretty brisk. Two-year-old store bullocks brought from £7 to £9 each; three-year-olds from £9 to £11 10s. each. Springers went off briskly at from £8 to £16 per head; and milk cows also met ready sale at similar figures. Three-year-old store heifers brought from £8 to £12 each. For sheep the demand was brisk at fair prices. Prices of pigs were lower, ranging for bacon pigs from 37s. to 40s. per cwt. Store pigs sold well at from 35s. to 45s. each. **BALLYBAY:** Prime beef went off pretty briskly at from 56s. to 58s. per cwt.; three-year-old heifers brought from £9 to £12; two-year-old ditto from £8 to £10 10s., and yearlings from £3 10s. to £5 each. Two-year-old store bullocks sold at from £7 to £10 per head. Springers and milch cows were not very numerous, and went off quickly, at from £.0 to £14 each. The pig fair was large, and in good request. Bacon on the foot brought from 38s. to 40s. per cwt.; stores from 25s. to 44s. each.

GLoucester CHEESE MARKET.—The supply was very small (about 30 tons), and consequently there was more tone to the trade than of late, factors being willing buyers, but prices cannot be quoted higher. Loaves and thickets fetched 66s.; broad doubles, 59s. to 60s.; best singles, 54s. to 56s.; seconds, 42s. to 44s.; and skim, 20s. to 30s. per cwt. A good clearance was effected.

GLASGOW CHEESE MARKET.—Supplies were about the same as last day; demand better. There were 16 tons passed the weigh-house scales, and six carts were shown in the market. New 42s. to 45s., prime early-made 52s., skim 22s. 6d. to 24s. per cwt. No alteration in other articles.

BELFAST, (Thursday last.)—Butter: Shipping price, 98s. to 103s. per cwt.; firkins and crocks, 10d. to 10½d. per lb. Bacon, 46s. to 50s.; Hams, prime 72s. to 80s., second quality 60s. to 66s. per cwt. Prime mess Pork, 76s. to 77s. per brl.; Beef, 120s. to 130s. per tierce; Irish Lard, in bladders, 66s. to 70s.; kegs or firkins, 60s. to 64s. per cwt. Pork, 42s. to 46s. 6d. per 120 lbs.

REVIEW OF THE CORN TRADE DURING THE PAST MONTH.

The past month closed the year's account with little satisfaction to the farmer, as the rates were brought to a lower range than during any month previous, viz., 40s. 2d. per qr. for wheat, the further decline in prices having been about 1s. per qr., notwithstanding the temporary rise produced in France by the late measure of Government, which seems eventually rather to have determined holders to send on here in preference to a subjection to Imperial decrees. The much-needed supply of rain has gradually fallen, and given a good soaking to the surface as well as fed the ponds, but the springs yet remain low. Nothing unfavourable to tillage or the autumnal sowings has yet occurred, the young wheat generally looking healthy and strong, but the forward pieces are in some danger of over-luxuriance from the excessive mildness of the temperature, as well as the ravages of vermin. Future prospects have become the great question with growers, and some would propose legislative help; but this quarter has always been of so doubtful a character, and terminated with such disappointment, that we are ready to adopt the suggestion, "Deliver me from my friends," rather than seek Parliamentary aid, and prefer looking round for the chances of improvement to the continual commercial changes that occur, first taking care that no fault or deficiency attaches to individual management. Still, when old burdens exist under new regulations, justice requires a prompt and effective relief. It would appear that the abundant crop of 1857, both here and in France, has still left its effects, though followed by only an average yield, and the heavy imports that have since obtained have weighed on the markets to that extent, that store-room has become difficult. The granary power of London is estimated at about 1,000,000 qrs. of room; we are, therefore, provided to this extent with grain of all sorts. Oats and other spring corn may equal 400,000, and wheat make up the rest. This, while the country markets are well provided, may continue to constitute a pressure against prices; but as the season advances, and the enormous consumption going on by cattle-feeding, malting, and distillation begins to tell, the fact that only a fortnight or month's consumption is in store will exercise its proper influence, and when once markets tighten the holders in granary will not be slack in their demand, in order to make up more favourable ac-

counts, especially as America and the Baltic continue a range of prices which for all practical purposes is prohibitory. The New Year, therefore, may yet obliterate many of the sad chapters of the Old, and again present the nation with the scene of agriculture and commerce united in prosperity. With this hope we heartily present our compliments to our friends.

The following will show the prices yet quoted in foreign markets, and while farmers complain of the result of their labours, they will see that importers have fared little better than they. In Paris, fair samples of wheat are to be bought at 37s. to 39s.; first quality red at Bordeaux was 39s. per qr. free on board; Upper Loire at Nantes, 36s. 6d. free on board; Mayenne white, 41s. 6d. f. o. b.; Lucon, 40s. free on board. The average price in Belgium was about 42s. 6d. per qr. on wheat; pale white wheat at Rotterdam, 44s.; Polish, 53s.; fine red Mecklenburg at Hambro' was quoted at 46s. The best wheat at Berlin was held at about 40s. per qr.; high-mixed at Danzig about 49s. to 50s. per qr. Odessa prices left no margin for business with this country, Polish being worth about 38s., Sandomirka 40s., and Ghirka 36s. 6d. per qr. The ports of Azoff quoted 30s. to 35s. per qr. At Galatz the rates were about 24s. to 30s. per qr. The demand for Spain, at Algiers, had raised prices of hard and soft wheat to 47s. 6d. per qr. New York exports were almost nothing, holders there relying partly on the closing of the canal navigation for the maintenance of prices: prime white Kentucky wheat had sold at 1 dol. 55c. per bushel (51s. 6d. per qr.), for consumption; fair white Southern, at 1 dol. 41c. (47s. per qr.); the low sort called Milwaukie Club was worth 1 dol. 9c. (36s. 6d. per qr.) France, therefore, which in ordinary years, like Britain, is an importing country, by its low prices and proximity chiefly influences the British markets; but before the season has ended she may resume her station, and be well nigh drained of her stores, notwithstanding the efforts of her government.

The first Monday in London opened on the back of large supplies, both English and foreign; this, with the mild weather prevailing, which affected the samples on show, made an unusually heavy market, though there were not large supplies during the morning from Kent and Essex. There was a good deal unsold, and the parcels that were quit-

ted only realized within 1s. or 2s. per qr. of the previous Monday's rates. The foreign trade was quite at a stand; and to sell was impossible, unless at a sacrifice: but generally it was deemed preferable to store, rather than submit to a reduction of more than 1s. per qr. The occurrence of the cattle shows at this period made markets thin in the country, but there was not generally so much depression as in the metropolis. Boston, Lynn, Manchester, Newcastle, and some other places, only reported a nominal trade; Leeds, Louth, Birmingham, Gloucester, and Bristol were all 1s. per qr. down; but Bury St. Edmund's was 2s. per qr. cheaper. Liverpool yielded on Tuesday 1d. to 2d. per 70lbs., but on Friday there was no change.

The second Monday was a quiet one, on good but not quite so liberal supplies. Kent and Essex sent up but few samples for sale; but there was plenty, with the limited demand, at the former currency. In foreign, business was equally calm, at unaltered rates. Again there was less disposition in the country to force business, some places evincing a resolution to take no less money by the withdrawal of samples. Hull and Birmingham were firm. Manchester, Stockton, and Bristol obtained previous rates; and Boston realized 1s. advance; but St. Ives, Louth, and Gloucester were all heavy, with some few other places. At Liverpool there was only a moderate business on Tuesday, the market being thin, and old prices were only obtained for the best qualities. Friday's report closed with a brisker trade.

The third Monday in London was but shortly supplied, both English and foreign together being only 12,500 qrs.; but the near counties sent up about an average quantity in the course of the morning. Among these samples, after the long prevalence of damp, there were several lots of rough that were still difficult to quit, but all those that were in fair condition were cleared off more readily than for some time previous. No advance could be established in foreign, but holders occasionally obtained an improved price on favourite bulks. Several of the country markets this week noted a small advance—as Birmingham, Sleaford, and Market Rasen—all reporting an improvement of 1s. per qr., Melton Mowbray and Newark making a rise of 1s. to 2s. Manchester, Sheffield, Newcastle, and most other places were firm. This week, however, closing with Christmas-day, the markets immediately previous were of a holiday character, Liverpool remaining much the same.

On the fourth Monday arrivals were small, as well as the morning's supplies from Kent and Essex. Very little was doing, London being still in a holiday condition, but the few good dry parcels that appeared were readily cleared off at former

prices. There was more firmness in good foreign qualities, with a moderate inquiry for mixing.

The imports into London during the four weeks noted have been as follows, viz.: of English wheat 24,951 qrs., of foreign 52,393 qrs., giving a weekly average of 19,336 qrs. against 18,901 qrs. for the previous month.

The imports into the United Kingdom for the month of November, in wheat were 276,007 qrs., and in flour 236,849 cwts.

The flour trade throughout the month has experienced very little change. Norfolks commenced at 28s. per sack, and the best town-made at 40s.: the former, after declining 1s., recovered the loss. The sale has only been slow, and supplies altogether pretty fair, neither French nor American being abundant. Fine qualities of the latter have become quite scarce, the first brands being of more value at New York than in London. The four marks at Paris have closed worth about 30s. per sack; and middling Canada barrels, at New York, have brought 5 dollars (= 20s. 7d.) per brl. The imports in the four weeks into London have been—in country sorts 74,386 sacks, of foreign 6,111 brls. 6,118 sacks, against 66,915 sacks country sorts, 8,645 sacks 2,156 brls. foreign, last month.

The four weeks' exports were 290 qrs. wheat and 14 cwt. flour only.

Barley of all sorts has been upon the decline, the high price of malting leading to substitutes, wheat itself included. The rates have, therefore, lowered 2s. to 3s. per qr., the greatest reduction taking place on the first Monday, second-rate and grinding being nearly as much reduced from the continued large foreign arrivals, principally from the Black Sea, the difficulty of storage adding to the depression of the market; and until the granaries are relieved, there does not seem much prospect of improvement, as maize, through the difficulty of selling in Ireland, has been brought down in value, and, consequently, lessened the consumption of the lighter grain. The arrivals during the four weeks, in London, were 17,810 qrs. native, and 78,814 qrs. from abroad, against 14,328 qrs. English, 40,146 qrs. foreign, for four weeks in November.

The malt trade has followed the reduction in fine barley to the extent of fully 2s. per qr., inferior kinds having become extremely difficult to place.

The supply of oats has not been half what it was in November; but the previous arrivals not being cleared from granary, rates have further given way on the first two weeks, when the quantities reported were most considerable, the first Monday yielding 6d. per qr., and the second 6d. to 1s. per qr. The subsequent falling-off kept the

rates steady; but there was no improvement. Prices having fallen so much, foreign orders have been resumed; and the exports for four weeks have amounted to 16,579 qrs. The imports into London in the same time were 2,418 qrs. English, 10,521 qrs. Scotch, 15,413 qrs. Irish, and 113,109 qrs. foreign; against 2,846 qrs. English, 4,470 qrs. Scotch, 11,325 qrs. Irish, and 236,353 qrs. foreign last November. The probability is that, should any frost happen, which may yet be reasonably expected, there may be some rally in this grain; and we quite expect it later in the season.

Both beans and peas have participated in the general decline about 1s. to 1s. 6d. per qr.; the first Monday, as in other grain, being the day of most decision.

The English supply of beans has been better than expected. The former good crop holding out well, and the arrivals from France following those of Egypt, have made a heavy trade. Reports of the crop at Alexandria being unfavourable, with the opening spring there may be some recovery.

As to peas, those for hog-feed have been undermined in value by barley and maize; the plentiful supplies of boilers from the Baltic, Canada, and the Black Sea, without the usual frost, have quite spoiled the English trade, and farmers with a minimum crop have been forced to accept unremunerating rates. As the season is now getting on, there does not seem much chance of an important improvement; and should Canadian supplies be kept up, they will very likely be appropriated to horse feeding.

The arrivals of beans in this port for four weeks were 3,542 qrs. English, 13,689 qrs. foreign. For peas 1,616 qrs. English and 8,672 qrs. foreign.

Of linseed there have been large supplies and exports—the former amounting to 70,179 qrs., and the latter to 28,668 qrs. On the first Monday, with an unusual quantity reported, the market gave way 1s. per qr.; but it has since settled into firmness, from the steady character of the export demand and scarcity of stock.

The seed market, excepting cloverseed, has been without interest. Spring tares arriving early, through the mildness of the season from abroad, have been held too high to attract buyers. Canary has passed its height, and become dull. White mustardseed has remained scarce and dear, but brown has continued in entire neglect. Hempseed, rapeseed, and the sorts used in confectionary have been saleable in retail at much the same prices. The tone of the cloverseed trade, as respects red qualities, looks more upward, the French market having begun to move, and offers f. o. b. are held higher than at first—say, about 56s. per cwt. for fine new Bordeaux, or 60s. per cwt. here. New English begins to appear also, but holders ask high rates, viz., about 70s. for stout but not very purple seed. Trefoil also is firm, but white cloverseed has not been in favour, and the rates may be considered nominal.

CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter.	
WHEAT, Essex and Kent, white	38	46
" red	35	42
Norfolk, Linc. and Yorks., red	38	41
BARLEY, malting	— to 33	Chevalier
Grinding	24	26
MALT, Essex, Norfolk, and Suffolk	54	63 fine
Kingston, Ware, and town made	54	63
Brown	51	52
RYE	—	new
OATS, English, feed	19	23
Scotch, feed	20	23
Irish, feed, white	20	23 fine
Ditto, black	19	21
BEANS, Mazagan	35	36
Harrow	36	37
PEAS, new, white boilers	40	40
Maple	40	43
Grey	37	38
FLOUR, per sack of 280lbs., Town, Households	34s.	34s.
Country	28	30
Norfolk and Suffolk, ex-ship	27	28

IMPERIAL AVERAGES.

FOR THE LAST SIX WEEKS:	Wheat.		Barley.		Oats.		Rye.		Beans.		Peas.	
	a. d.	s. d.	a. d.	s. d.	a. d.	s. d.	a. d.	s. d.	a. d.	s. d.	a. d.	s. d.
Nov. 13, 1858	41	10	35	5	23	2	31	0	43	4	43	8
Nov. 20, 1858	41	2	35	1	23	11	32	4	42	7	45	11
Nov. 27, 1858	41	2	35	4	22	9	31	6	42	7	45	11
Dec. 4, 1858	41	5	35	4	22	8	31	2	42	6	43	10
Dec. 11, 1858	41	0	35	1	22	10	32	6	41	8	43	8
Dec. 18, 1858	40	2	35	11	21	10	32	5	41	1	46	5
Aggregate average	41	1	35	0	22	8	31	10	42	4	44	11
Same time last year	49	11	38	0	23	8	34	4	42	4	41	7

HOP MARKET.

BOROUGH, MONDAY, Dec. 27.

Mid and East Kents	70s.	84s.	choice	120s.
Weald of Kents	52s.	62s.		68s.
Sussex	50s.	58s.		62s.

POTATO MARKETS.

BOROUGH AND SPITALFIELDS.

LONDON, MONDAY, Dec. 27.—Full average time-of-year supplies have come to hand since Monday last, coastwise and by land carriage. The imports have amounted to 247 tons from Dunkirk, 150 from Antwerp, 232 from Rouen, 163 from Dieppe, and 30 baskets from Rotterdam. The trade rules very inactive, yet scarcely any change has taken place in prices.

York Regents	80s. to 100s.	per ton.
Lincolns	80s. to 90s.	"
Essex and Kent	70s. to 90s.	"
Scotch	60s. to 85s.	"
Foreign whites	45s. to 55s.	"
Ditto reals	55s. to 70s.	"

ENGLISH BUTTER MARKET.

LONDON, MONDAY, Dec. 27.—Our trade generally is slow, indeed no business seems doing on this day.

Dorset, fine	118s. to 120s.	per cwt.
Ditto, middling	98s. to 100s.	"
Fresh	12s. to 16s.	per dozen.

WOOL MARKETS.

ENGLISH WOOL MARKET.

LONDON, MONDAY, Dec. 27.—Although the advices from the manufacturing districts are very favourable, there has been no movement in the English wool trade since our last report. Holders, however, are very firm in their demands, and prices rule steady, with every prospect of a decided improvement in them. The supply of wool on offer is very moderate.

LIVERPOOL, DECEMBER 24.

SCOTCH WOOL.—There has been less doing in all classes this week. Being near the end of the year, the manufacturers and staplers buy very sparingly before their usual stock taking, but the general stocks being light, holders are very firm, and are looking forward for some improvement after the beginning of the new year.

FOREIGN.—There has been some inquiry this week by parties looking after small lots, and holders might want to close sales before the end of the year; otherwise the demand has been limited to immediate wants.

THE FARMER'S MAGAZINE.

JANUARY, 1859.

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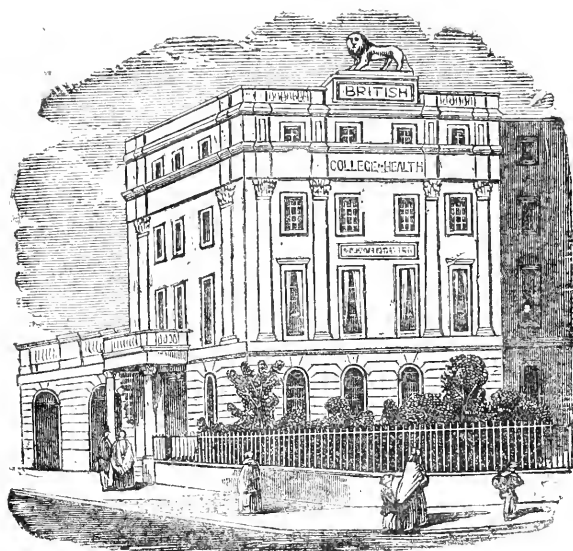
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FELLOW-COUNTRYMEN,

SINCE we addressed you last year, the Medical Profession have obtained from Parliament what they call a "MEDICAL REFORM BILL;" but wherein the "reform" consists, so far as the public is concerned, we are at a loss to make out. If any good for the people at large had been effected by the measure, we should applaud it; but so far as we can see, the Bill only appears to us to be a step in the wrong direction, by creating a kind of Medical Inquisition throughout the country. In their appeal to Parliament, Doctors went on the plea, that many persons, not being legally Doctors of Medicine, fraudulently assumed the title, and by that means took many fees which otherwise would have gone into the pockets of the Simon Pures. Now, we are not the parties who, for one moment, would uphold such a state of things, for we think that MEN SHOULD BE WHAT THEY SEEM; but at the same time, we do not believe that such a practice has been carried to any very great extent. Most people, when they employ a Doctor, know pretty well what they are about, but they well know also that *no two of them agree!* However, be this as it may, the British Parliament were prevailed upon to pass a bill, which tends to establish a sort of Medical Inquisition in the country. We say, "tends," because it is only the small end of the wedge which has at present been driven; but we fear that unless the people are alive on the question, they may hereafter find themselves under as horrible a Medical Priesthood, as Protestants would be if they allowed the terrible Inquisition of Rome to have sway in this country. There must be liberty of thought in Medicine as in Religion; and since the Romish Church does not allow such liberty, we protest against it, as being against the liberties of mankind. It is entirely owing to this great principle of liberty of thought and action, that England now stands so pre-eminent over all the nations of the earth; and will you do any thing, or consent to any thing, that may do away with this greatness? Surely not. Well, then, let Members of Parliament beware how they interfere with the "*Medical Liberty of the Subject*;" for as sure as that liberty is taken from the people, so sure must the downfall of England commence, because we look upon Medical Liberty as the key to all our liberties. If you have not Medical Liberty, you cannot have Religious Liberty;—you have a Medical Priesthood, you must have a Religious Priesthood; you have Doctorcraft, you must have Priesterft; and if you have a Medical Inquisition, you must have a Religious Inquisition—the one supports the other! The late JAMES MORISON, the Hygeist, clearly foresaw all this, as appears in his Biographical Sketch, wherein he exhorts the people to free themselves from the thralldom of a Medical Priesthood, under which the country is groaning.

You have had this last year some terrible examples as regards the power of the Medical Priesthood with respect to alleged lunatics; but you are much deceived if you fancy that our Parliamentary noodles will do much next Session to alter the present disgraceful state of things as regards lunatic asylums, &c. From experience we know the perfect apathy of Members on every thing pertaining to medicine. They are perfect children on such a question. It will only be necessary for a Member or two to talk about "medical science" (heaven save the mark), "respectable practitioners," and so forth, and John Bull will be perfectly willing, sane or insane, to be dragged to a mad-house, without even the chance of obtaining the writ of habeas corpus!—that bulwark of English liberty. We are getting up a petition to Parliament on this question of lunacy, to be presented next Session, but we have little faith of its success. The usual rallying cry of "Quackery," will be quite sufficient to prevent Honorable Members from doing justice to the people, and the consequence will be that Doctorcraft will again appear to the country as having

obtained another victory. So it was with respect to the Poison Bill, which is now a dead letter, merely because it was found that Doctorcraft, being the principal meddlers with poisons, they could not be interfered with. Even Dr. William Palmer, of Rugeley notoriety, did not open the eyes of our Parliamentary noodles on the question. The fact is, we are a doctor-ridden country, and until people will think and judge for themselves on the laws of health and disease, they must expect to have Doctor Palmers. Look at the dreadful suicide by Strychnine, reported in the "Daily Telegraph." There we find an account of a young girl taking "an infallible vermin destroyer," containing that cursed strychnine, which has been introduced into the Pharmacopœia as a medicine. We hold the medical faculty to be responsible for all such cases. This infernal strychnine, we understand, is scarcely ever used: then why is it not altogether done away with from the Pharmacopœia? How will our Parliamentary noodles now deal with these "infallible vermin destroyers?" A thing more dangerous to the whole country could not be devised. And who have we to thank for the introduction of these deadly poisons? Why, our friend the doctor? who has made them ten thousand times more dangerous by holding them out as "medicines in certain cases,"—the difference between the Doctor and the Poisoner being only a question of half-a-grain, or even less. Think of this, and the whole question is at once made palpable. We have attempted, by illustrations, to expose the infamy of the whole concern, and it now remains for the people to assert their right on this all-important question. We may add that the Illustrations are sold at the "Hygeist" Office, 262, Strand, London, price 6d. each.

You are aware, from the newspapers, of the terrible failure of re-vaccination in the French army by order of Napoleon the 3rd. The mortality attending the regiments at Toulouse from that loathsome disease was frightful. It is exactly what we expected, but all seems to be *forgotten!*

The schism which now exists between the Allopath and Homœopathic Doctors ought to open the eyes of the public to their contradictory theories, but we presume that, like other things, it will be a nine days' wonder, and that John Bull will just allow himself to be treated for his diseases right or wrong—hit or miss. Should it be so?

As regards the Universal System of JAMES MORISON, the Hygeist, which has now stood the test of 33 years' most extensive practical experience in all parts of the world, (during which period upwards of 500,000 persons have been cured of their diseases,) we have only to say, that the principles of that system are before the world, and by them, Hygeists must stand or fall.

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| <p>1.—All animal bodies consist of <i>fluids</i> and <i>solids</i>.</p> <p>2.—While in a state of embryo, all animals consist <i>entirely</i> of fluids.</p> <p>3.—It is from and by the fluids that the solids are <i>formed</i>.</p> <p>4.—The fluids contained in the human body are <i>four times</i> the weight of the solids.</p> <p>5.—The chief of the fluids is the blood, from which all the others are derived.</p> <p>6.—The blood not only <i>repairs</i> every part of the human machine, but also carries with it all the rubbish or <i>decayed parts</i>, to be deposited in the intestines previous to being <i>expelled</i> along with the excrement.</p> <p>7.—The blood is the <i>life</i>—the <i>primum mobile</i>—the <i>first agent</i>—from which all others derive their origin.</p> <p>8.—Health depends upon the <i>purity</i> of the blood.</p> <p>9.—The purity of the blood depends upon its having <i>free outlets</i> for its decayed particles.</p> <p>10.—Disease is induced by the <i>choking up</i> of these outlets in the bowels, by reason of an accumulation of glairy mucus on the inner surface of the intestines, &c.</p> | <p>11.—This accumulation is occasioned by anything that weakens the circulation or impairs digestion, but chiefly by the poisonous drugs and bad treatment of the Faculty.</p> <p>12.—The impurities thus detained in the blood, occasion <i>every</i> species of disease, according to the quality of the humour, or the particular locality in which it is lodged.</p> <p>13.—All diseases proceed from <i>one</i> source, therefore they may all be cured by <i>one</i> medicine.</p> <p>14.—This medicine must be a <i>vegetable purgative</i>, innocuous in itself, yet sufficiently powerful to pervade the whole system, clear away such mucus, and purify the blood.</p> <p>15.—The discovery of a <i>vegetable compound</i>, capable of being digested, and mixing with the blood, so as to impart to it the energy requisite for ridding the body of <i>superfluous</i> humours, was a desideratum.</p> <p>16.—This discovery was made by JAMES MORISON, the Hygeist, in the composition of the <i>Vegetable Universal Medicine</i> of the British College of Health, Euston (late New) Road, London.</p> |
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If these principles are correct, (of which we ourselves and hundreds of thousands of others have no doubt) then it follows, that all the terrible Pharmaceutical poisons which load our Chemist shops, and which are to be had for the asking, might be done away with, thereby saving a great number of valuable lives. Poisonings are increasing throughout the country, all owing to Doctors having spread Poisons throughout the length and breadth of the land, and are now become quite common everywhere. You have lately had a terrible catastrophe at Bradford, through arsenic having got into lozenges by mistake—this very arsenic is used by Doctors for the alleged cure of skin diseases. We would take issue with such Doctors upon this very point, and contend that with our simple *Hygeian Vegetable Purgatives*, we could cure, whilst they failed to cure, such skin diseases; but the fact is, that all such deadly poisons are kept before the world to throw mystery and confusion in the healing art, and thus form the strong bulwark of a *Medical Priesthood*, from which the nations of the earth have yet to emancipate themselves.

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FEBRUARY, 1859.

[THIRD SERIES.

THE
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MONTHLY JOURNAL
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DR. HASSALL

ON

THORLEY'S FOOD FOR CATTLE.

FROM THE "MARK LANE EXPRESS," 10th JAN., 1859.

74, WIMPOLE STREET, CAVENDISH SQUARE, 21st December, 1858.

HAVING, on more than one occasion, been requested to make an analysis of THORLEY'S WELL-KNOWN FOOD FOR CATTLE, and to express my opinion respecting it, I placed myself a short time since in communication with Mr. Thorley, desiring to be furnished with certain particulars relating to his Food. Mr. Thorley, who was previously a stranger to me, at once conducted me over his Manufactory, showed me all the ingredients employed, and also the process of manufacture of the article.

I took away with me samples of the food as well as of every ingredient entering into its composition. I have since carefully examined and tested these, and I have also compared the samples procured at the Manufactory with others obtained by myself from other sources.

I am, therefore, now in a position to express an authoritative opinion respecting the composition and properties of THORLEY'S FOOD FOR CATTLE. I would remark of it—

First. That the ingredients used are all of excellent quality, and are purchased without regard to expense.

Second. That the receipt or formula, according to which the Food is prepared, is an admirable one, no ingredient being selected on account of its cheapness, but those only being chosen which are best adapted to fulfil the objects intended.

Having regard, thus, to the composition of THORLEY'S FOOD FOR CATTLE, I find that it possesses the following properties in an eminent degree—it is highly nutritious and fattening—it is a tonic and gentle stimulant, aiding, when mixed with other descriptions of food, materially the digestive powers of an animal—a point of great consequence, since it is an undoubted fact that much of the nourishment contained in the ordinary food given to cattle is lost in consequence of the impaired or defective action of the digestive organs.

Comparing THORLEY'S FOOD FOR CATTLE with other Cattle Foods, with the composition of which I am acquainted, I unhesitatingly assert that it is infinitely superior to any others, at present known to me. In all those of the composition of which I have a knowledge, I have found ingredients to be present which have been added solely on account of their cheapness, that is for the purpose of adulteration, and to the exclusion of other more valuable, but more expensive, articles. In some of the Foods I have detected ingredients which are positively hurtful.

Comparing, also, the samples taken by me from the Manufactory with others procured from different sources, I found a perfect accordance in the composition of both series of samples.

Before bringing this Report to a conclusion, I would notice an objection sometimes urged against the use of Cattle Foods generally, namely, that the price at which they are sold exceeds considerably that of the materials from which they are prepared; this can be readily shown to be a very unreasonable objection. THORLEY'S FOOD FOR CATTLE is a compounded and manufactured article, upon the composition and preparation of which much care, labour, and expense have been and are bestowed. Moreover, the refuse materials resulting from the cleansing, grinding, &c., and which are an entire loss, amount to twenty per cent. To estimate, therefore, the value of such an article merely at the cost of the raw materials is both absurd and unjust.

Neither must the value of this, or any other Cattle Food, be determined by the exact amount of nourishment contained in them; although in the case of THORLEY'S FOOD this is very considerable, but the indirect effects resulting from its employment must be taken into consideration; that is, the effects of the article in improving the appetite, digestive powers, and general vigour of the Cattle fed upon it. By the improved condition of the digestive organs animals may be fed upon coarser and cheaper articles of food, and from which, without the aid of THORLEY'S FOOD, they would be unable to extract all the nourishment which such articles actually contain. I consider, then, that the use of THORLEY'S FOOD is attended, not with an additional, but with a considerable saving of expense.

I am glad, therefore, to be enabled to recommend—which I do strongly and conscientiously—THORLEY'S FOOD FOR CATTLE as a highly important and valuable compound for the feeding of all descriptions of Cattle.

Signed,

ARTHUR HILL HASSALL, M.D.,

Analyst of the Lancet Sanitary Commission; Author of the Reports of that Commission; of "Food and its Adulteration;" "Adulterations Detected;" &c., &c.

From Alfred Brown, Esq., Wandsworth, Surrey, Member of the Royal College of Surgeons, England; Licentiate of the Apothecaries' Company, London; Fellow of the Medical Society of London; late Demonstrator of Anatomy at the St. George's School of Medicine.

Wandsworth, Surrey, Dec. 11, 1858.

Sir,—I shall feel obliged by your sending me another cask of Thorley's Cattle Food. I have been making experiments with it upon one of my milk cows, and think it only fair that I should let you know the results. My cow, before I used the Food, was fed upon hay, wortzel, and water *ad libitum*, and upon this diet she yielded one gallon of milk per day, making two pounds of butter per week. She was five months gone with her second calf; when she had the Food I discontinued giving her the wortzel, and gave her a measure-full (about half-a-pint) of the Food with a peck of damp chaff night and morning; besides, she had as much good hay as she would eat. Upon this diet, in less than a week she doubled the quantity of milk and butter; and in order that I might be sure that this excellent result depended upon the Thorley's Food, I discontinued it, and returned to her former diet, and she speedily went back to the gallon of milk per day. After waiting about a fortnight, I again returned to the Thorley's Food, and in a few days she increased to two gallons of milk per day. This experiment I repeated several times, and with the same results. I have tried the Food upon other animals—horses, sheep, &c.—and with the most satisfactory results. I have also analysed the Food, and find that it contains nothing that would in any way injure the system or constitution of cattle. You are at liberty to make any use you please of this communication, and I am, Sir, yours, &c.

To Mr. J. Thorley.

ALFRED BROWN.

THE FARMER'S MAGAZINE.

FEBRUARY, 1859.

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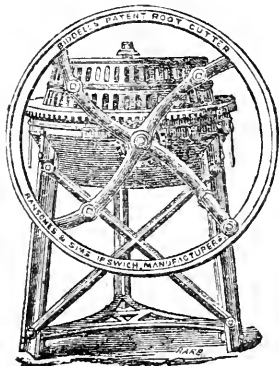
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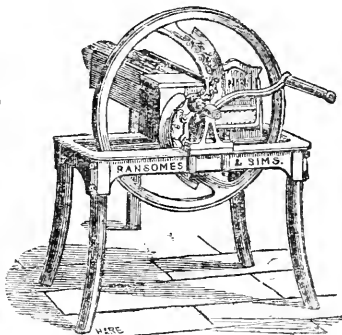
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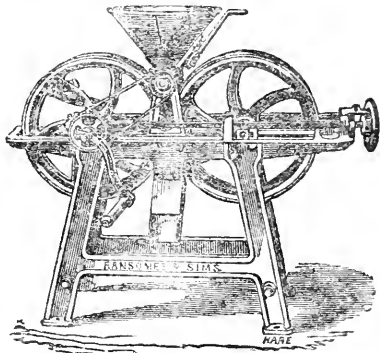
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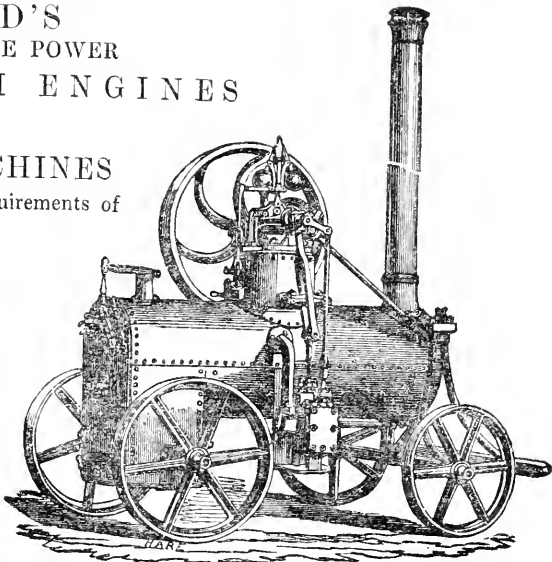
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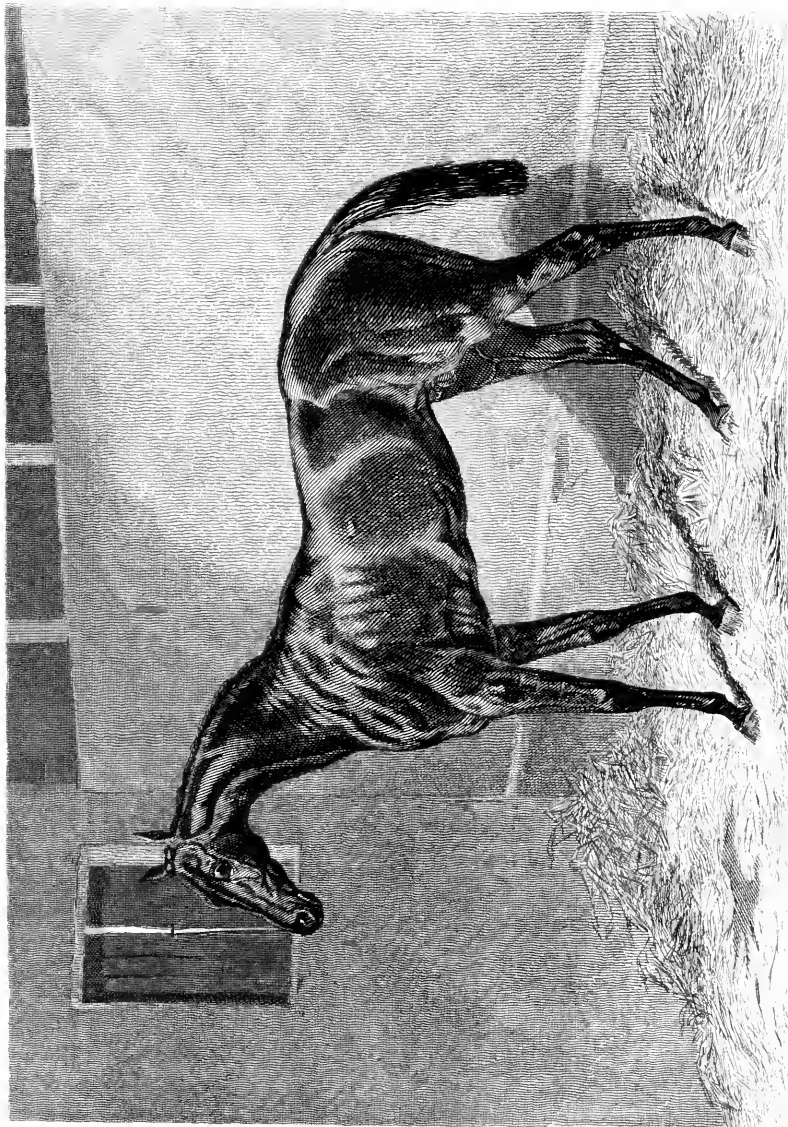
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—*Naval and Military Gazette*, Feb. 1, 1851.

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—*Sun*, Evening Paper.

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THE FARMER'S MAGAZINE.

FEBRUARY, 1859.

PLATE I.

A SHORTHORN STEER,

THE PROPERTY OF MR. ROBERT LYNN, OF STRONTON, GRANTHAM.

This steer, bred by Mr. Lynn, and calved Dec, 20, 1854, was got by Sir John (12084), dam (Princess Royal) by Richmond (4947), g. d. (Priscilla) by Belvoir (1708), gr. g. d. (Phœbe) by Sir Roger-de-Coverley (5187), gr. gr. g. d. by Albion (1619), gr. gr. gr. g. d. by a grandson of Favourite (252). Sir John was the winner of five first prizes.

This steer took, on December 2nd, 1857, at the Rutland Agricultural Society, the second prize of 7 sovs., for oxen or steers of any breed or weight, under five years old, and open to all England; on December 4th, at the Leicester Agricultural Society, the second prize of 5 sovs., for oxen or steers of any breed, under five years old, and open to all England; and on December 8th, at the Smithfield Club Cattle Show, the first prize of 25 sovs., and the silver medal for the breeder, as the best Shorthorn steer not exceeding three years old.

This excellent steer was especially remarkable for a wonderfully-good fore-quarter. He was unfortunate only in encountering, on each occasion of his being exhibited, Mr. Wortley's famous gold medal ox. An older animal, the latter naturally beat him in the all-aged classes at Oakham and Leicester, and, again, as the best of all in Baker-street.

PLATE II.

BEADSMAN; WINNER OF THE DERBY, 1858.

Beadsman, bred by Sir Joseph Hawley in 1855, is by Weatherbit, out of Mendicant, by Touchstone, her dam Lady Moore Carew, by Tramp—Kite, by Bustard.

Weatherbit, bred by Mr. Gully in 1842, is by Sheet Anchor, out of Miss Letty, by Priam. He was a strong favourite for the Derby of his year, and a good but not lucky race-horse. He was sold by Mr. Gully to the Duke of Bedford at four years old, and soon transferred to the stud. He opened here well with Weathergage in 1851, and his fame as a stallion is rapidly increasing. Amongst other winners, Weatherbit is the sire of Diomedea, Pugnator, Pampa, Triton, Pauli Monti, Dabchick, Delusion, Kelpic, Hugo, and a whole run of useful W's—Weathergage, Weathercock, Weatherproof, Weatherglass, and so on. Weatherbit left Newmarket in 1856, and has been standing for the last two seasons with Mr. Jaques at Easby Abbey, Yorkshire. A good judge, who saw him here in the autumn of last year, pronounced him to be the best-looking stallion out, to get "useful horses." Beadsman puts his rank at something even more than this.

Mendicant, bred by Mr. Whitworth, in 1843, takes precedence as an Oaks winner, and was altogether a very superior mare. Perhaps, to look at, there never was a more beautiful illustration of the poetry of motion than the elegant Mendicant with the equally elegant horseman Sam Day upon her back. After her famous but unfortunate race for the Chester Cup, and when first favourite for the Ascot Cup, Sir Joseph Hawley gave Mr. Gully the stiff price of two thousand five hundred for her. She was put to the stud the following year, and threw Misericoorde, who died young, in 1849, Friar Tuck in 1850, Suppliant in 1852, Gabelrunzie in 1854, and Beadsman in 1855—there being nothing, so far, to rank with the latter.

Beadsman is a dark brown horse, standing fifteen hands two inches and a-half high. He has a somewhat plain head, in which he does not take after his beautiful mother; but the eye is full and expressive. He has a clean, blood-like neck, which he arches in a very distinguished style when in action. His shoulder is rather upright, and a little heavy at the point. He has a light barrel and ribs, a muscular back, drooping quarters, with good gaskins and thighs. He has famous arms, clean hocks and knees, with not very large bone. Beadsman stands a little upright before; is a blood-like, wiry-looking, but rather leggy horse. He trains light, has a certain "style" about him, especially when moving, and takes altogether a good deal after his dam, although without that refinement of appearance for which she was so famous.

SEED STEEPS.

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

The attempt to improve the germination of seeds long since engaged the cultivator's attention. Chemical philosophers soon came to their aid; but, hitherto, with but little success. It is now nearly half-a-century since Sir H. Davy was experimenting in this important direction. Davy soon found what others have since done—that the germination of the seed might be readily hastened by the use of particular solutions. The difficulty did not end there, however. Certain chemical substances which promote early germination, seem to produce a languid after-growth. But, still, some rather good advances have been made. It will be useful, as spring seed-time is now close upon us, if we examine the effect produced by a few of these steeps. This inquiry will hardly be rendered less valuable by the present low value of seed corn. It is evident, indeed, that the less return we receive for our crops, the more necessary it becomes to increase their produce and to diminish the cost of cultivation.

Davy's failures even, in his seed-steeping trials, were useful; they pointed out the errors which were to be avoided. It was long after his time that the use of superphosphate of lime and certain concentrated nitrogenous mixtures was introduced. His trials in the farmer's cause were commonly more resembling the alchymicists' researches of the olden time than those of modern agricultural chemists. Davy also had the disadvantage of walking over the soil too much alone: he farmed as he was wont to fish on the sunny banks of the Kennett, and the romantic German rivers, either by himself or with other chemists: he had not the advantage of exploring the highly-cultivated modern farms of our island, arm-in-arm with their skilful cultivators.

It was in recording some of his trials on accelerated germination that he told his readers (*Elem. Agri. Chem.*, 218) that he had found several chemical menstrua which rendered the process of germination much more rapid when the seeds are steeped in them; but the result proved that the practice was inadmissible, for seeds so treated, though they germinated much quicker, did not produce healthy plants, and often died soon after sprouting. This celebrated chemist steeped radish seed, in September, 1807, for twelve hours before they were sown, in a solution of chlorine, and similar seeds in very diluted nitric acid, in very

diluted sulphuric acid, in a very weak solution of sulphate of iron, and some in common water. The seeds in solutions of chlorine and sulphate of iron threw out the germ in two days, those in nitric acid in three days, in sulphuric acid in five, and those in water in seven days. But in the cases of premature germination, though the plume was very vigorous for a short time, yet it became at the end of a fortnight weak and sickly, and at that period less vigorous in its growth than the sprouts which had been naturally developed. Davy thus was led to very correctly conclude that "too rapid growth and premature decay seem invariably connected in organized structures; and it is only by following the slow operations of natural causes that we are capable of making improvements. The failure of these powerful steeps with one or two root crops deterred Davy from further experiments. It was long after his time that the same acids were more successfully applied to the seeds of certain cereal grasses. In the summer of 1844 a Scotch farmer, Mr. G. Dalziel Holm, of Drumlanrig (*Trans. High. Soc.*, 1846, p. 316), tried the steeping of seed barley; and his experiments were reported by him to the late Professor Johnston. He used diluted sulphuric acid before sowing the seed, with a very marked effect on the luxuriance of the crop. In August, 1845, he observed in a letter to the Professor, "the difference was very marked in all the stages of growth, and in the end the quantity per Scotch acre was eight bushels more on the land sown with the steeped than in that sown with the unsteeped grain."

My readers will feel with the reporter of these trials (and the farmer never had a more zealous friend than Johnston), that this was a very curious fact—an experiment well worthy of being repeated on other soils, in other districts, and on different varieties of barley. But this experiment is not the only one made about the same time, on the effect of acid steeps on the growth of corn. In the report of the annual meeting at Munich, in 1844, of the German agriculturists, similar trials are reported made in Silesia by Tinzmann. In these, barley was steeped for six hours in sulphuric or muriatic acids diluted with forty times their weight of water: about five pounds of acid per acre gave one-fourth more grain and straw. Steeping in pure water gave more straw, but a very slight increase of grain. The same quantity of acid diluted with

water, and sprinkled over the ground before sowing, gave very little increase. Arthur Young had long before this time arrived at the same conclusion.

When diluted with forty waters the sulphuric acid browned the outside of the grain, but did not prevent its growing well; it ought, however, for safety to be diluted with fifty or sixty times its weight of water. Tinznann also tried the sulphuric and muriatic acids upon wheat, oat, and vetches, and upon turnips and grass seeds; and in all cases he found the steeped seeds, especially when sulphuric acid was used, do better than the unsteeped. It was on soils which had been long in good cultivation that the effect of these acid steep was found by the German farmer to be most observable.

Half a century elapsed from the trials of Davy, and we find another chemical philosopher in 1857 cautiously repeating and extending these important experiments. "The idea," well observes Professor Voelcker (*Jour. Roy. Ag. Soc.*, vol. xix., p. 164), "of dressing seed with various fertilizing matters is not a new one. Several attempts of applying manure to the seed instead of to the land have been made, and the most preposterous advantages resulting from seed-manuring held out by certain men, whose interest it was to sell comparatively cheap fertilizing matters at an enormous profit. These attempts, as might have been expected, have proved complete failures. I allude to these attempts of manuring and steeping the seeds, because I do not wish to be suspected of entertaining for a moment the idea that the system of seed-manuring is based on rational principles. My sole object in engaging in the subjoined experiments was to ascertain if, by any chemical means, the germination of the turnip-seed could be promoted, and to collect additional evidence respecting the effect of ammoniacal manures on the germination of seeds.

"With this object in view, I made the following experiments with new Norfolk bell-turnip-seed.

No.

1. 100 seeds were soaked for 20 hours in distilled water, containing 2 per cent. of sulphuric acid.
2. 100 seeds were soaked for 20 hours in distilled water, containing 1 per cent. of sulphuric acid.
3. 100 seeds were soaked for 20 hours in distilled water, containing 5 per cent. of sulphuric acid.
4. 100 seeds were soaked for 20 hours in distilled water, containing 2 per cent. of sulphate of ammonia.
5. 100 seeds were soaked for 20 hours in distilled water, containing 5 per cent. of sulphate of ammonia.
6. 100 seeds were soaked for 20 hours in 3 oz. of

distilled water and $\frac{1}{2}$ oz. bone-ash dissolved in sulphuric acid.

7. 100 seeds were soaked for 20 hours in 3 oz. of distilled water and 1 oz. of bone-ash, dissolved in sulphuric acid.
8. 100 seeds were soaked for 20 hours in 3 oz. of distilled water and $\frac{1}{2}$ oz. of Peruvian guano.

The seed prepared in this way was sown on the 15th of May, 1857, in garden-mould in flowerpots. On the same day were sown also in flowerpots—

9. 100 seeds with $\frac{1}{2}$ oz. of superphosphate, made by dissolving fine bone-dust in 50 per cent. of brown acid.
10. 100 seeds with $\frac{1}{2}$ oz. of bone-ash, dissolved in acid.
11. 100 seeds with 1 oz. of bone-ash, dissolved in sulphuric acid.
12. 100 seeds with $\frac{1}{2}$ oz. of Peruvian guano.
13. 100 seeds with $\frac{1}{2}$ oz. of Peruvian guano, mixed with 1 oz. of soluble silica rock, finely powdered.
14. 100 seeds with $\frac{1}{4}$ oz. of sulphate of ammonia, mixed with $\frac{1}{2}$ oz. of powdered soluble silica rock.
15. 100 seeds, sown with 120 grs. of sulphate of ammonia and $\frac{1}{2}$ oz. of powdered soluble silica rock.
16. 100 seeds with $\frac{1}{4}$ oz. of Peruvian guano.
17. 100 seeds without anything.
18. 100 seeds without anything.

"The flowerpots containing these 18 experiments were regularly watered every day. The soil was constantly kept in a moderately moist condition, and the result observed from time to time."

The general conclusions arrived at from the result of these trials are thus added in the Professor's report—

"1. That the seed employed in the experiments was of good quality, 94 in one trial and 90 in a second, out of 100, having germinated.

"2. That turnip-seed unprepared and merely moistened occasionally, germinated more rapidly than the seed in all the other experiments.

"3. That very dilute sulphuric acid killed the seed.

"4. That a dilute solution of sulphate of ammonia killed many seeds, and retarded greatly the germination of those that survived. Thus two-thirds of the number of turnip-seeds were killed, and only one-third germinated. It will also be seen that sulphate of ammonia sown in considerable quantity with the seed also killed it, whilst in more moderate doses it greatly retarded the germination of the surviving seeds.

"5. That Peruvian guano, even in small quantities, had the same effect as sulphate of ammonia: hence the danger of drilling in turnip-seed or carrots with guano, even when previously mixed with ashes.

"6. That superphosphate of lime, instead of hastening, rather retarded the germination of turnip-seed.

"7. That superphosphate made from bones, and containing ammonia, is more liable to injure the seed than superphosphate made from bone-ash or mineral phosphates. Thus only 60 plants came up in No. 9, in which bone superphosphate was used, and 80 plants in No. 10, in which experiment the same quantity of bone-ash superphosphate was employed.

"It follows from these experiments—

"1st. That it is advisable to mix artificial manures, such as guano and superphosphate, with as large a quantity of ashes as is practicable, if the manure is sown dry, and to mix the artificial manure with much water if the liquid-manure drill is used.

"2ndly. That superphosphate of lime, especially when made from bones, does not hasten the germination of turnip-seed, but rather the contrary.

"I would observe, however, that when fairly up, the plants manured with superphosphate grew much more vigorously than the others, and soon were twice as big as the rest. Although superphosphate does not promote a more rapid germination of the seed, it is yet extremely useful in favouring a vigorous growth of the plant, thereby bringing the crop out of reach of the turnip fly."

These experiments certainly deserve to be extended (and other chemical substances have to be tried). It is no reason against success that we do not exactly comprehend the nature of the asserted beneficial action of diluted sulphuric acid on seeds. This kind of ignorance naturally precedes almost all discoveries in agriculture. The use of lime

and chalk as manures, for instance, would have been postponed to a very recent period, had the Roman and early British farmers waited for a scientific explanation of their action. When sulphuric, muriatic, and nitric acids, mixed with charcoal, were first experimentally applied by Arthur Young to barley in 1782 ("Annals of Agriculture," vol. i. p. 151, vol. iii. pp. 120 121), he had no knowledge of the action of the acids on the phosphate of lime of the charcoal—a result afterwards so well explained by Liebig. And when the great German philosopher did, sixty years after Young's trials were made, explain the result of the mixture, cautious old gentlemen shook their heads; and one of these gravely expressed his horror, in a note to one of our leading agricultural papers, at "the monstrous proposition" of applying sulphuric acid to the soil! Twenty years have not yet elapsed since this energetic tirade against the use of mineral acids on agriculture, and now more than half of the sulphuric acid of commerce finds its way into the farmer's service. We must, then, continue to experimentalize even in doubtful fields of research. Arthur Young used thus to carry on his inquiries. He always seemed actuated by the spirit of his contemporary, the celebrated Priestley, whom Davy thus so feelingly and instructively described in the introduction to his "Chemistry"—"He exposed all the substances he could procure to chemical agencies, and brought forward his results as they occurred, without attempting logical method or scientific arrangement. He possessed in the highest degree ingenuousness and the love of truth. No person ever discovered so many new and curious substances."

NOTES UPON SHEEP-FEEDING.

BY CHARLES W. HAMILTON.

There must always be a great difference of opinion as to the decision of judges at our cattle shows, and I should be the last to bring forward a mere opinion on the subject; but I think that the discussion of one case upon which I have taken pains to obtain accurate information may be of some assistance in future to the Royal Dublin Society in classifying, and their judges in deciding prizes.

In the schedule advertised for the 25th November, class 26 was for a pen of long-woolled wethers, not exceeding twenty-two months old; class 30, a pen of short-woolled wethers, not exceeding thirty-four months old.

Now, if this means anything, it means that a short-woolled sheep takes a year longer than a long-woolled sheep to fatten. As a short-woolled sheep-breeder, I

must protest against this inference, and express my belief (in support of which I am in a position to produce facts) that the distinction is founded merely in ignorance on the part of the Committee of Agriculture.

The only entries in class 30 were: Three Southdown wethers, born in 1856, and bred by Hugh M. Tuite, Esq., of Sanna; three Shropshire-down wethers, born in 1857, and bred by me. Mine were, therefore, a year younger; and as the instructions to the judges were to base their decisions on "the amount and quality of flesh, lightness of offal, and early maturity," I thought it desirable to compare the lots more fully than the judges who awarded the first prize to Mr. Tuite's wethers had the opportunity of doing, and so test their judgment. The lots were each weighed in the show-yard, and were exactly equal, viz., $4\frac{1}{2}$ cwt., or averaging

12 stones live-fasted weight each. They were bought by the same butcher, and at the same price, viz., £3 each. The dead weights were:

Mr. Tuite's three sheep—carcasses.....	315 lbs.
" " inside fat.....	48 lbs.
My own three sheep—carcasses.....	302 lbs.
" " inside fat.....	43 lbs.

So that by feeding a year more, his produced only 4lb. 5 oz. of meat, 1lb. 10 oz. inside fat, or about 3s. more of value on each sheep, an amount, as in this case, not sufficient to affect the selling price.

Now let us compare the cost of feed. Mr. Tuite's were fed in his park at Sanna until about six weeks before the show, when they were put on rape, but received no bought food whatever. Mine were kept upon pasture not above a-third of the value of his park at Sanna until July 25, when I began to give them as much oilcake as they could eat, and latterly half-a-pint of oats per diem. They were, therefore, for four months strongly forced. On the 1st May, 1858, I valued my hoggets at £2; they immediately afterwards gave me each 7lbs. of wool, which sold for 11s., and they then stood me for fattening at 29s. Although the South-downs which I imported from Sussex used to give me only from 3½ to 5lbs. of wool, yet, as I have no proof of what Mr. Tuite's sheep clipped, I will assume that his sheep in their hogget year were started shorn at the same value, 29s.; I will also assume what I believe to be pretty nearly the value of the year's average keep of such a sheep as 20s., and at this rate the cost of Mr. Tuite's sheep will have been £2 19s. My three wethers consumed in addition to the same charge, for

	£.	s.	d.
Pasturage.....	0	11	3
15 stone 1 lb. oilcake.....	1	0	9
2 stone 2 lb. oats.....	0	2	0
Each.....	1	14	0
Cost at May.....	1	9	0
	£3	3	0

I therefore got in nineteen months within 4s. of what Mr. Tuite got in thirty months, and if early maturity, the mother of the tripping sixpence, is the farmer's great object, I think I have put my sheep in the first place, though the judges put them in the second. As to the quality of mutton, that must always be a matter of taste; but I believe that though a saddle of five-year-old Southdown mutton (that aristocratical myth), from its acknowledged superiority, is a worthy prelude to such a bottle of port or 34 Lafite as may have lain in the cellars of Sanna for twenty years, doubling its price at compound interest, yet that the same compound interest will have worked up the mutton to above 1s. per pound, and if the butcher made no objection to giving 1s. per pound, I would keep my sheep on for him, not otherwise; and I also believe that hogget mutton is really superior to two shear, though inferior to three shear; and know that the London and Brighton butchers seldom get Southdown mutton to kill much older than twenty months, whatever they may subsequently call it, to please old-fashioned customers.

I am now going to tread upon more delicate ground,

though I fully feel how dangerous it is to draw conclusions from isolated experiments; but as the value of artificial food is a matter of such vital importance to the farmers, I think it may be useful to throw out the following observations, in order to lead others who have more opportunity to multiply and reason upon them more extensively.

The experience of the practical farmer has long ago convinced him that bought food does not pay for itself in the increase of beef and mutton, but that a manifest improvement takes place in pastures where sheep have been fed with oilcake.

The natural question for the farmer to ask is, how much of the cost of the oilcake consumed am I to charge to the animal, and how much to the pasture? In my own case how much of the £1 2s. 9d. paid for oilcake and oats, with the whole of which I have debited my sheep, ought really to have gone to the debit of the pastures, as compared with the top-dressing of guano which Mr. Horsfall proves to be so remunerative?

If we refer to the able article of Messrs. Lawes and Gilbert, "On the composition of some of the animals fed and slaughtered as human food" (proceedings of the Royal Society, June 17, 1858), we find the following conclusion from an extensive series of accurate experiments and analyses:—

"Taking first the proportion of each class of constituents stored up for 100 of the same consumed, it is concluded that in the case of sheep liberally fed on a mixed diet of dry and succulent food, the increase of the animals will, perhaps, generally carry off less than 5 per cent. of the consumed mineral matter; somewhere about 5 per cent. (varying according to the proportion in the food) of the consumed nitrogenous compound substance in the food; and lastly, that for every 100 of collective dry substance of food consumed there will be in sheep about 8 or 9 parts of dry matter in increase stored up." It is clear from this that out of my £1 2s. 9d. worth of food the sheep have had value in only 2s. 9d. What has become of the rest?

The average daily consumption of my wethers was, of

Oilcake	1½ lb.
Oats	0½ lb.

In the first experiment, which was made to determine the amount and manurial value of the solid excrement, one of the wethers was compared with a ewe, same age and size, which had never had any feed but grass; they were kept for 48 hours on a clean floor, and the dung was carefully collected as often as possible; it weighed for the

Wether	6 lbs. 7 oz., or 3 lbs. 3½ oz. per diem
Ewe	5 lbs. 15 oz., or 2 lbs. 15½ oz. ,,

The same sheep were subsequently placed in a sheep shed, the bottom of which consisted of spars, which enabled me to collect all the urine which passed during 24 hours; it was collected frequently, and carefully guarded against evaporation, and the amount measured in a glass vessel graduated for water (I do not make the slight correction on account of the specific gravity) was, for the

Wether	2 lbs. 11½ oz.
Ewe	3 lbs. 11 oz.

This, as well as other matters referred to, were all analyzed by Professor Apjohn, so far as to ascertain their manurial value, and from his report I subjoin the following extract:—"In wether's dung:

Water	58.96
Dry matter	41.04
	100.00

The dry matter is composed of

Organic matter	66.50
Ash { Insoluble in muriatic acid	15.30
Soluble in do.	18.20
	100.00

The 18.20 parts soluble in muriatic acid contained 3.72 phosphoric acid = 8.07 phosphate of lime. 100 parts of the dry dung gave 2.49 ammonia; extracting the money value of this from the phosphate of lime and ammonia, I find that

One ton when dried is worth	£2 12 2
Do. before being dried	1 1 7

Dung of the ewe—

Water	70.29
Dry matter	29.71
	100

The dry matter gave

Organic matter	65.91
Ash { Insoluble in muriatic acid	19.72
Soluble in muriatic acid	14.37
	100

In the 14.37 parts of ash were found 2.44 phosphoric acid = 5.31 phosphate of lime. 100 parts of the dung gave 2.51 ammonia. Money value—

Dry dung	£2 7 7
Dung before drying	0 14 1

The wether's dung, was, therefore (allowing for the quantity rendered), valued at 1s. 0½d., and the ewes 8½d. per cwt. The monthly value of the dung would be, in the wether 10d., ewe 6d.

The analysis of the urine was as follows:—"Urine of ewe, sp. grav. 1.009. It was strongly acidulated with muriatic acid, and then evaporated down, until upon cooling it was converted into a solid; the residuum was weighed, and found to constitute 2.609 per cent. of the weight of the urine; such amount of it (2.609 per cent.) was then burnt with soda lime, and in this way it was found to yield 0.542 per cent. of ammonia = 0.390 nitrogen. Urine of wether, sp. grav. 1.057; treated in the same way it gave a much larger residuum, consisting of 25.43 per cent. of urine, and this, when burnt with soda lime, gave 9.165 per cent. of ammonia = 7.45 nitrogen. The comparison gives—

	Sp. gr.	Ammonia.	Nitrogen.
Urine of ewe	1.009	0.542	0.390
Urine of wether	1.057	9.165	7.486

We then arrive at this conclusion, that the urine of the wether yields very nearly seventeen times as much ammonia as that of the ewe, and that using the ammonia as a measure, the value of the urine of the wether is to that of the best Peruvian guano in the ratio of 9 to 17."

The greater quantity rendered in this case by the ewe reduces the ratio from 17 to 12, and the value of the

urine would be per month, wether 4s., ewe 4d.; so that we have in ammonia and phosphate of lime a differential value in favour of the wether fed on oilcake of 4s. 1d., or 16s. 4d. out of the £1 2s. 9d., to give to the improvement of the land; and the corrected statement of the cost of the two lots going into the show-yard would be—

Mr. Tuite's	£9 19 3
Mine	0 7 8

The nine per cent. stored up in the carcass, according to Messrs. Lawes and Gilbert, will be valued at 2s. 6d. The exudation (which is probably added to the value of the sheep track) would, according to Barrall, as quoted by Mr. Horsfall, be one shilling's worth, leaving only 3s. unaccounted for, and this is probably owing to the exorbitant price of oilcake. At £9 10s. per ton, my account would have balanced.

I have thus reasoned upon the manurial value of the excretions to show that though the feeding of my sheep cost 4s. more than the feeding of Mr. Tuite's, yet that my gain was three times that sum in improvement of the land. I have my money to turn again, instead of losing a year's interest upon it; and besides, all the chances that the use of next summer's grass may give in; besides, I shall shear a hogget while he shears a two-year-old sheep.

Let us now take the differential weights. I have in nineteen months produced nearly as much mutton as Mr. Tuite has in thirty-one months, or, as the quantities were, as 105 to 101 nearly, and his increase was 3st. 6lb. per month, unassisted. I may assume that mine, increasing at somewhat of the same rate, 3st. 6lb. on the gross, owed 40lb. in 10lb. per month to the extra feeding, equal at the rate—

They sold for	£1 4 0
But the extra feed cost	1 2 9½

Money gained £0 1 2½,

unless we admit what the judges ignored—the great tendency to early maturity in the Shropshire Downs.

I have made these calculations on the results of the first experiments, which I believe to have been the best, as between a sheep wholly grass-fed and one fed on oilcake, &c. As, however, the result seemed so unexpected, I made a second trial between two wethers that had been fed equally on oilcake and oats, dropping the artificial food with one (No. 2), and feeding him on grass alone for three days previous to his being shut up for twenty-four hours. The urine alone was analyzed, and contained per pound avoirdupois—

	Sp. Grav.	Grs. Ammonia.	Grs. Phos. Lime.
No. 1	1.0428	252.80	3.92
No. 2	1.0057	33.12	1.76

The per-centage difference is not the same as in the other case, but three days was probably not sufficient to prevent the previous highly nitrogenized feeding from having told on the secretions of No. 2; but the experiment is the more satisfactory, as showing how completely the value of the excretion follows the quality of the food.

I had the oilcake also carefully analyzed by Dr.

Apjohn, and though he reports it as being only of average quality, it gave of

Water	12.80
Protein compound	26.18
Oil.....	10.50
Starch, lignin, &c.	43.42
Ash	7.10

100.

And the ash gave per 100 parts { 5.088 ammonia.
4.710 phosphate of lime ;
so that one pound of the oilcake produced of

	Gr.
Ammonia.....	355.60
Phosphate of lime	329.70

Oats, according to Boussingault, would contain—

	Gr.
Ammonia	154.00
Phosphate of lime	229.60

Now let us look to the quantities No. 1 consumed during the twenty-four hours he was shut up : 2lbs. of oilcake, $\frac{1}{2}$ lb. of oats. This was more than the average, as he ate little else in confinement. The consumption was, therefore, of

	Gr.
Ammonia	783.20
Phosphate of lime	774.20

The liquid excretion, taking the quantity as the same voided in the first experiment, would be of

	Gr.
Ammonia	687.30
Phosphate of lime	10.70

The difference in the ammonia is very nearly what would be accounted for in the quantity stored on, according to Mr. Gilbert, together with the small proportion voided in the dung. It is clear, from the former experiment, that the phosphate of lime can be equally well accounted for in the solid excrement, though, in this instance, the urine alone was analyzed as a check upon the former remarkable result, which I think it has fully confirmed, and the quantities were not again measured. I am not chemist enough to do more than point out the general bearings of Dr. Apjohn's analysis, but I think I have sufficiently opened the question for others more qualified to take it up, and shown the practical farmer that where he gives artificial food to his sheep, out of every £10 expended at least £8 15s. goes to the improvement of the land.

This will further lead to the conclusion, that where the manure made by cattle fed in the house is carefully guarded from waste, the value of one class of manure may be much greater than that of another ; and there is no doubt that its application to crops should be regulated accordingly, for there is *great waste* in giving to crops more than a *sufficiency* of manure, whatever that may be.

Having begun by a comparison between two lots of sheep belonging to different breeds—the Southdowns and Shropshire Downs—I wish it to be understood that I do not question the superiority of the former, fed upon their own dry and warm Sussex Downs, as to quality of mutton ; but in my own instance, and that of some of my friends who have imported and kept up flocks of

pure Southdowns, I have seen a great tendency to degenerate, arguing an unsuitableness to our climate ; and in this I am borne out by the observations made at the London Central Farmers' Club by Lord Berners, on the 6th Dec., 1858 :—

“ Mr. Bond had truly observed that we must look to the breeds both of sheep and cattle, and select those which were best suited for early maturity. Mr. Bond had referred to the Hampshire Down, a class of sheep with whose value he (Lord Berners) was fully acquainted, for he had tried them to a great extent. It cost him £600, however, to try them on his land in Norfolk, and he was glad after all to get back to Sussex. Subsequently he tried the Sussex Downs in Leicestershire, and the success he had achieved in Norfolk induced him to persevere with them twelve years in the former county, but the climate and soil proved unsuited to their development, and he had to give them up for the Leicester and the heavier breeds.”

It is for this reason that, although the mutton of the Southdown may be a shade superior to the Shropshire, yet I think the latter better suited to Ireland ; they are in mutton very much superior, and in wool and early maturity nearly equal to the Leicester. They flourish on the cold clays of Staffordshire, and I think I have amply proved their tendency to early maturity, a point upon which Lord Berners lays so much stress, and the judges of the Royal Dublin Society so little.

CENTRAL FARMERS' CLUB.

The following subjects have been selected for discussion during the ensuing year :—

FEBRUARY 7.—Arterial Drainage—including the state of our Rivers and Water-courses—proposed by Mr. J. A. Clarke, Long Sutton, Lincoln.

MARCH 7.—The Education, Discipline, and Introduction of the young Farmer to Life—Mr. R. Bond, Kentwell, Long Melford, Suffolk.

APRIL 4.—The Progress of Agriculture—Mr. R. Smith, Emmett's Grange, South Molton.

MAY 2.—The Advantages of Steam in Agriculture—how far they have been availed of—Mr. J. J. Mechi, Tiptree Hall, Essex.

JUNE 6.—What System of Cultivation upon Mixed Soils will, under present circumstances, be found most profitable ? —Mr. R. Baker, Writtle, Essex.

NOVEMBER 7.—The Growth of Seeds in alternate Husbandry, without the admixture of Trefoil or Rye-grass—Mr. J. Marshall, Riseholme, Lincoln.

DECEMBER 5.—The Composition of Different Varieties of Vegetables and Plants, and their respective Values as Food—Mr. J. C. Nesbit, Kennington Lane.

The discussions will commence at half-past five o'clock, p.m. Members unable to attend these meetings are invited to forward practical information upon them. Their letters will be handed to the introducer of the subject to which reference is made.

PREMIUMS FOR THE BEST MANURES.

THE HIBALSTOWE TURNIP EXPERIMENT.

There is still one branch of the business of the farm which has long been conducted in a very unsatisfactory manner. This is the further remarkable as it is a feature that of late years has been more and more developing itself. The progress of modern agriculture is as directly identified with the use of artificial manures, as with the employment of improved machinery or the extension of good stock. The trade has been gradually increasing, but at the same time by no means assuming that general tone of respectability and confidence it ought properly to possess. In fact, to this day the farmer, in commercial phrase, is a "shy" buyer. The greater the competition, only the greater would appear to be the roguery. If the manufacturer means right, it is not always that he can answer for his agent; while there are some notable instances where the imposition has been altogether wholesale. With some honourable exceptions, the dealing in manures is still a lottery, with the player or purchaser, as in the majority of such games of chance, of course the sufferer.

Many schemes have been devised for meeting such an evil. In the first place, you should adopt the great rule of all commercial transactions, and only deal with respectable people. Then you must not regard the mere cheapness, or rather the lowness in price, of the article supplied. Indeed nothing has been found to be dearer than cheap manures. Further, you must be very cautious how you credit testimonials, but read them rather as you would the puffs to quack medicines. The good men whose signatures you see may have been deceived, as they often enough are. Their experiments may have been tried with a very different sample to what the world at large could obtain. Many a reference has ere now denied himself. Above all, however, the buyer should have an analysis of what is sent him. Let some competent chemist tell him what it is really worth, and if not equal to its character let it at once be returned. But this is scarcely as easy a matter as it seems to be. The other contracting party will in all probability demur, or refuse outright to abide by any such opinion. A law-suit will hardly increase the profits of the venture, and so the farmer is placed on the horns of a dilemma—wanting and willing to buy good manure, but not knowing where to get it. Men of fair fame certainly allow their names to head the prospectus of many such a Company. Others offer their word for the good they have really derived from the use of certain sorts, and Professor Way, or Professor Voelcker, or Professor Nesbit, or Professor Anderson, are always available. Still, we repeat, the business is not altogether satisfactory, and we certainly require some other means to put it on a better footing.

The farmers of Lincolnshire, in their need, have gone back to a precedent. They know full well already

that any man in the line has always the best kind of implement or the best breed of cattle. It is naturally the same with the manufacture of manures. There is not an agent comes into the market but who represents the most respectable house, and has the most valuable sample to show them. But we want something more in these days, than a man's mere *ipse dixit* of his own worth and character; while we don't want to be drawn into lawsuits, or to have our Ways and Voelckers publicly out-sworn. Tell it not in the West Country, carry it not to the remote region of Barnstaple, and excite not with such a rumour the busy hives of the Ipswich, the Bedford, or the Leiston Works! But the farmers of Lincolnshire, instead of abolishing have extended the action of the prize system. They intend to have not only prize Shorthorns and prize Steam Engines, but prize Manures. It must be understood, too, there was no leading up to this, but that it has been a purely spontaneous movement amongst the farmers themselves, conceived and carried out by no greater machinery than the Brigg Market Ordinary. It has been well done, too. If, indeed, agriculturists will only properly organize similar tests of this kind, the chicanery of manure-making will soon become an unprofitable profession. Let them all learn how a consummation so devoutly to be wished is to be attained. When, then, Mr. Richardson, with his brother farmers to aid him, resolved on offering prizes for manures, he did not send round to the different manufacturers or to local agents for specimens; but he *took the sample to be tried from the bulk some consumer had still in store*. Here was a test, assuredly, in its very purity. There could be no questioning as to this being the sort of stuff you are prepared to sell at so much a ton? It actually had been; and the greater, accordingly, the triumph of those who now rank as the makers or vendors of the prize manures. We direct the most careful attention of our readers to the following report; for we really know of few movements of late that have promised to so directly benefit the practical farmer. The perseverance in and more general adoption of such a course will leave him no longer at the mercy of the Trade. Every dealer now will work with the knowledge that his wares may be thoroughly and publicly tested, and that the better they are the proportionately better will it be for his business. It is creditable to many firms having connections in Lincolnshire to see how readily they answered to the challenge. It is only by their continued willingness to do so that we shall be able to draw a line between the fair and unfair dealer. It is not every one that can hope to get a prize; but by such a means we shall soon know those that are really doing justice to their customers—the approxi-

mation of excellence between an actual winner and those who follow him. A golden rule in commerce is to offer only a good article. A few lucky hits may be occasionally made in less legitimate ways; but it is a simple truism to say that the better known a good tradesman is, the better will it be not only for the public, but equally for himself. How much more, or how much more readily, would the farmer buy, if he could depend on being honestly served? On the contrary, people gradually habituate themselves to do without many things that they cannot get good at a fair price; and so drink less wine, smoke fewer cigars, and spend less at hotels than they were once wont to, simply from their being so often taken in. We are not quite sure but the use of artificial manure was gradually falling again from precisely the same cause.

Altogether the Hibaldstowe experiment is a rare commentary on the abuses of the prize system. Whether it be proceeded with or not, we believe it already to have been the means of doing a great deal of good, in putting both buyer and seller becomingly alive to their own interests. The plan has already been taken up, in another part of the same county, under the auspices of the Sleaford Society, where a similar award has been made. We only wonder how long it will be before this kind of thing is found out to be all a mistake. When prizes for manures will not be needed. When farmers had better not be selected to judge of their merits. When these public tests will only be an annoyance and an expense to the great manufacturers, to whom we ought to go at once for what we want, without any inquisitorial proceedings of this kind. The men of Lincolnshire have, however, long been famous for a lead in matters agricultural, and this step will tell equally to their credit and intelligence.

The Hibaldstowe turnip experiment was determined last month, when the cups offered as prizes by Mr. Richardson were presented to the successful competitor, Mr. James B. Horner, of Lincoln, at the ordinary held at the Angel Inn, Brigg. Originally the prizes were advertised to be of the value of £5 respectively; but Mr. Richardson—the originator, or, at any rate, the worker-out of this movement—enlarged considerably upon his primary offer, and the result is that Mr. Horner has acquired the possession of two cups, the money-value of which cannot be far short of £30. But Mr. Richardson's liberality did not stop here; for Mr. Seagrave, of Liverpool, broker to the Phospho-Peruvian Guano Company, was also presented on the same occasion with a silver tankard of exquisite workmanship. The cups were manufactured by Messrs. Elkington and Co., of Birmingham, designed from an old Saxon cup, called the "Lover's Cup." Cup No. 1 bears the following inscription:—

"Hibaldstowe Challenge Cup, open to All England, awarded to Mr. J. B. Horner, of Lincoln, for the best one acre and a-half of common turnips grown on the farm of T. M. Richardson, Esq., with Odam's Superphosphate in competition with other artificial manures."

The second cup—the prize for the Swedish turnips—of precisely similar design, workmanship, and value to that given for the common turnips, bore this inscription:—

"Hibaldstowe Challenge Cup, open to All England, awarded to Mr. J. B. Horner, of Lincoln, for the best two acres of Swedish turnips grown on the farm of Mr. T. M. Richardson, with Phospho-Peruvian Guano in competition with other artificial manures."

The tankard, a very handsome piece of plate, has this inscription:—

"Presented by Mr. T. M. Richardson, on the occasion of the successful competition of the Phospho-Peruvian Guano in the growth of Swedish turnips on his farm at Hibaldstowe, to Geo. Seagrave, the broker to the Phospho-Peruvian Guano Company."

At two o'clock, the hour fixed for the ordinary, a company of nearly 100, including some of the most influential agriculturists of the neighbourhood, had assembled in the dining-room of the Angel Hotel. Mr. George Nelson, of Limber, the chairman of the ordinary, presided.

In the course of the evening, Mr. WILLIAM SKIPWORTH said he was exceedingly glad to see so many of his brother-farmers present on this occasion, which must be regarded as most important to all engaged in the business of agriculture. It was paying a well-merited compliment to Mr. T. M. Richardson, who had done the agricultural community of the county very good service by stepping forward and enabling them to test the qualities of the principal manures before the agricultural public. The manures put into competition for the Hibaldstowe experiment had, he fully believed, been most faithfully tested, and he was also fully of opinion that the experiment would be of great and intrinsic value to farmers. A good deal had been written on the subject of this experiment, which, in his opinion, would have been as well left alone. In one letter that he had seen published in a newspaper, the produce of 15 or 16 tons of turnips to the acre was considered to be small in the extreme; but it must be remembered that the land on which the experiment was tried was in a completely exhausted state, having been cropped in succession until it had no nutritious properties left it. That was as it should be. It was not wanted to test the manures on land in a high state of cultivation; for it would have been no test at all. He repeated that he firmly and fully believed that everything straightforward and honest had been done in the matter, and that the prizes had been justly awarded.

The CHAIRMAN proposed the health of the winner of the two extraordinarily handsome cups which now stood on the table before him. He (the Chairman) felt that Mr. Horner had honestly and fairly gained these prizes; but it might not be out of place for him (the Chairman) to say a few words by way of explanation of the origin and carrying out of the Hibaldstowe experiment. This originated last Spring, only two or three weeks before the time of sowing Swede turnips, so that it was palpable that the inuendos that had been thrown out, that time was allowed for the manufacture of a special manure for the occasion, were manifestly without foundation. He had heard this hint from one or two quarters, but he did not believe that anything of the kind had been done—by either one or other of the competitors. Another thing he had heard was—and he was sorry to feel that it was a duty incumbent upon him to repeat it—that Mr. Richardson had, in carrying forward this experiment, been actuated by a selfish motive ("No, no"). But he need scarcely say more than this, that every one who had the slightest knowledge of Mr. Tom Richardson would not for a moment believe that he could be actuated by a selfishly interested motive. And, really, he (the Chairman) thought they could have no better

proof of the disinterested spirit by which Mr. Richardson had been actuated in carrying forward this experiment than the two very beautiful cups now before him. It would be remembered that Mr. Richardson's original offer was two prize cups of the value of £5 each; that was, one cup for the best acre and a-half of common turnips, and one for the best two acres of Swedish turnips. But in order to prove beyond all shadow of doubt that he was actuated by no selfish motive, Mr. Richardson had far exceeded his original offer, and had also, in addition to the two cups, given a handsome silver tankard to the Phospho-Peruvian Guano Company; so that, instead of the two prizes of the money value of £10, as originally offered, Mr. Richardson had expended not less than £30. That, he (the Chairman) thought did not look very much like an interested motive. And besides that, he could bear personal testimony to the very great trouble Mr. Richardson had taken in this experiment, in order that it might be brought to a satisfactory conclusion. Mr. Richardson had been most painstaking in the matter, and had spared neither trouble nor expense. He (the Chairman) for one would not undergo the trouble and annoyance with which this experiment had been attended for double the amount of cost of manuring 20 or 30 acres of land. But they all, as farmers, were deeply indebted to Mr. Richardson for having come forward to try this experiment. They all well knew that since the introduction of a large number of artificial manures a searching and honest test was urgently required. That test had, he conscientiously believed, been applied in the case of the Hibaldstowe experiment. It had been tried on land exhausted by cropping, and that was the proper way to do it; for it would be of no use whatever to go upon land in a high state of cultivation. But however exhausted the land was, he must give his friend Mr. Richardson the credit that it was perfectly clear of twitch and filth. All such experiments must be attended by a large amount of trouble to the person who undertook to carry them out, as he had already intimated; and he (the Chairman) could assure that not for a much greater inducement would he be tempted to undergo what Mr. Richardson had done. With regard to the objections raised as to the manner in which the experiments had been carried out, he would remark that ever since guanos, &c., were introduced into this country, they had wanted a sound test as to their respective merits; and with a view of accomplishing, in some measure, this desirable end, the experiments in question had been set on foot. And in conducting these experiments they did not want land in a high state of cultivation, but the reverse; for the manures to be tested should be divested of all helps in every shape. Experiments made with artificial manures, assisted with farm-yard manure, &c., were no experiments at all. The Hibaldstowe experiments, as bringing into play the intrinsic value of the various manures, he looked upon as one of the best tests that had been carried out in this country for many years; he, in fact, had never heard of anything like it. He had long wished to see the matter taken up as it required to be, but he had wished in vain until Mr. R. came forward. He thought, therefore, they would agree with him in thinking that they were greatly indebted to that gentleman; and looking at the character of the judges, and the open manner in which the competition had been conducted, he believed there could be no charge of partiality or favouritism. In concluding his observations, the speaker, in presenting the cups, addressed a few highly eulogistic remarks to Mr. Horner, and urged him to go on in his endeavours to produce a good article, and in the end, he had no doubt, he would find for it an abundant sale. Be-

fore sitting down, however, he reminded manufacturers of manure that now that farming produce was so low in price, they must do their best to meet the somewhat, in consequence of these low prices, reduced means of the farmers. The Chairman then alluded to the advantages to the agriculturist derived from a judicious outlay of money in the cultivation, and concluded by giving the health of Mr. Horner, the successful competitor in the Hibaldstowe experiment (cheers).

Mr. HORNER, on rising to respond, said: It has always been my wish and desire from the very commencement of this experiment to see it carried out on the broadest principles possible, to have every well-known good manure in the contest, not even omitting bones dissolved or undissolved, Peruvian guano, farm-yard manure, &c.; and it is satisfactory to know I have stood the contest honourably and faithfully with all these, and have been tested and weighed in the analytical scale of Dr. Vöelcker, and am happy to say, not "found wanting." On these grounds, gentlemen, I conscientiously feel I am duly entitled to these two cups which have been so fairly and impartially awarded by our honourable judges, the first cup being for the heaviest and best one and a half acres of common turnips grown with Odam's manures, and the second cup being for the best and heaviest two acres of swedes grown with the Phospho-Peruvian guano. Gentlemen—The superiority of my manures has this day gained me a proud position in placing me as the successful competitor in both experiments, and what still adds greater weight and importance to this glorious success, is the honour, gentlemen—the distinguished honour of having these two prize cups presented by our noble chairman at this the renowned Brigg ordinary, which I consider second to none in intelligence, wealth, and good-fellowship. Now, gentlemen, let me tender my warmest thanks to Mr. Richardson for these two munificent gifts, and more particularly when I must know he has exceeded, far exceeded the limits of the prize advertised; but this, gentlemen, only accords with his usual liberality, and I am quite sure I shall only be echoing the sentiments of my brother-competitors, when I say we have during this experiment been most handsomely and most courteously received at his house, for which myself and brother-competitors feel we owe a debt of gratitude. Gentlemen, the great and main thing in this paper warfare that has been assailed and impugned on the character of Mr. Richardson, is that this experiment has been a mercenary scheme; this I deny *in toto*, and if it has been a scheme at all, it has been an honourable scheme of my own, which I can very well explain. It is now some nine months ago when I entered this room almost a perfect stranger, not even knowing Mr. Richardson; and finding that from the want of the merits of my manures being better known, I could not do so much business as I should like, I one day over this table, in conversation with Mr. Richardson, Mr. Brown (of Appleby), Mr. Hobson, and many other gentlemen, made this proposition to Mr. Richardson—that I would give him one ton of each of my manures, if he (Mr. Richardson) would give them a fair trial by the side of bones, Gibbs' guano, farm-yard manure, &c. In reply, Mr. Richardson said, "I tell you what I will do, I'll throw open a 26-acre field next to my house for public competition, and if you can grow swedes there you can grow them anywhere; the land has been heavily cropped and is perfectly exhausted, and just the very piece to try the merits of your manures." Mr. Brown fell in with the idea, and thought such an experiment would be a very good thing. Mr. Hobson also, with his usual cool, collected, and sound judgment, made these remarks, and said, "We keep trying the various artificial manures year after year on different soils—sometimes with farm-yard manure, or something else—and

never seem to come to any definite results; and I think one public experiment, as Mr. Richardson suggests, where the manures are to be applied alone, at the same cost per acre, without ashes or anything else, and on the same soil, and all done under the same management, is just the thing the farmers want. On the strength of these remarks from Mr. Brown, Mr. Hobson, and many other gentlemen present, Mr. Richardson said, "I will advertise the experiment next week, and throw it open to all England." I now think, gentlemen, what I have said is sufficient to exonerate Mr. Richardson from any scheme, beyond that of a great, grand, and praiseworthy public scheme for the public benefit. Gentlemen, agriculture must be progressive—must go a-head. It cannot stand still: it is the source from whence millions derive the means of satisfying their daily wants, and must, therefore, go on increasing in its results, in accordance with the increased demands which are made upon its resources; and it is to such enterprising, energetic gentlemen as Mr. Richardson, that we, the manure-merchants, the manure-manufacturers, and you, the farmers, are indebted, for keeping pace with the necessary progressive movements of the day. What has this Hibaldstowe experiment shown us? It has shown us that the well-incorporated, uniform, and well-manufactured superphosphate made by our friend Mr. Odams took the lead and ascendancy, for common turnips, over all other ammoniacal phosphatic manures, producing a weight of four tons per acre more than the lowest competitor. We also learn that the phospho-Peruvian guano has taken the ascendancy in the experiment for swedes, beating bones and Gibbs' Peruvian guano some two or three tons per acre; and as the time has now come when the great aim of the farmer must be to produce the greatest quantity of food for man, and that at the least possible cost, I think Mr. Richardson has, through the instrumentality of this Hibaldstowe experiment, made a great, grand, and progressive achievement in finding out those manures that are best adapted to grow the largest amount of produce per acre at the least possible cost.

Mr. FREDERICK RICHARD MARSHALL (who officiated as vice-chairman, in the absence of Mr. West), proposed "The health of the Judges—Mr. Hobson, of Kettleby Thorpe; Mr. C. Nicholson, of Stanwells; Mr. Fowler, of Kirton Grange; Mr. C. Nicholson, Mr. John Stephenson, of Bunham; and Mr. M. Maw, jun., of Cleatham." Mr. Marshall passed a warm eulogium upon the gentlemen whose healths he had proposed, for the admirable manner in which they had performed their arduous and important duties. Speaking from intimate acquaintance with Mr. Hobson and Mr. Charles Nicholson, he said, better judges for the experiment could not have been selected; for they were among the best growers of turnips in the county of Lincoln.

Mr. HOBSON responded. Mr. Horner had referred to a conversation which took place in that room with respect to the experiment which they had seen brought to a successful issue. It was suggested at that time that an equal amount of money value per acre should be represented in the contest, and he (Mr. Hobson) might take to himself the credit of that money value. Subsequently a wish was expressed to reduce the standard, and it was done; but he, nevertheless, was still of opinion that the amount he fixed in the first instance would have been better (Hear, hear). As to the manner in which the experiment had been carried out, he believed that nothing could have been more fair and just (Hear, hear). The land had no producing properties left in it beyond its natural capabilities (Hear, hear), and that was the only proper way in which to try such an experiment. Had manure been left in the land, it could not have been termed a fair test, but in this

case the land was perfectly bare (Hear, hear). It had been insinuated that some manure entered for competition had been specially manufactured for the purpose; but, really, looking at the very short time which elapsed between the competition being invited by Mr. Richardson and the sowing of the seed, he saw no reason for believing that anything of the kind was done by any one of the competitors. He had every reason to believe that the competing manures were taken from the bulk, and if there was any fault at all in the contest it rested with the manures themselves.

Mr. Matthew Maw and Mr. John Stephenson also briefly responded, expressing their belief that the experiment was a *bona fide* and honest test of the value of the different manures entered for competition. [Mr. Fowler was not present.]

Mr. HORNER rose and said, that in order to render the experiment as satisfactory as it possibly could be to all parties, he would suggest that the winning lot of swedes should be re-weighed on the 16th of February, and the result then announced.

The CHAIRMAN next presented to Mr. George Seagrave, of Liverpool, the introducer of the Phospho-Peruvian Guano into this county, the silver tankard which we have before referred to. He said the farmers were much indebted to the introducers of these manures; but he must again impress upon manufacturers the necessity of producing fertilizers at as low a price as consistent with adequate remuneration, in order to meet the present reduced rates of agricultural produce.

Mr. SEAGRAVE said: This guano has been applied at the rate of 13*l.* per ton, or, in other words, in the quantity of about 1 oz. to the square yard, in competition with the liberal application of other manure of very deserving high character. Under any circumstances, too great a compliment cannot be paid to some of the manufacturers of such manures as have been supplied in the case of the experiment in question, at the rate of price at which they have been entered, and upon which the calculations have been based. I feel convinced, judging from these analyses, that my native county can proudly boast of a fair and honest competition such as no other county enjoys; and I feel assured that the unvarying supply to the agriculturists of Lincolnshire of artificial manures, up to the standard of these analyses, will, instead of, as I am told exists, a "shyness between the buyer and seller," or rather "on the part of the buyer towards the seller," call forth a pleasurable greeting at every market meeting whenever the manufacturer, agent, or seller shall be brought into contact with the consumer. In addition to which, I am assured that the seller or sellers of adulterated manures in this district (if he or they have not already done so) will find the honest competition so hot for them, that they will have to repair to some less favoured district (which will be likely to prove more favourable to them and to their calling), where neither analysis nor guarantee is required: under such competition as I have just alluded to, the sale of spurious manures will in time be most effectually put a stop to, by the proof of comparative practical experiment and demonstration. And in order not only effectually but speedily to put a stop to such impositions, which are the true cause of the "shyness on the part of the farmer towards the seller of artificial manures," not knowing in whom he may place confidence, and on the principle of "once bit twice shy," and which shyness we must all look upon as the natural consequence—I say, in order not only effectually, but speedily to put a stop to imposition, Mr. Richardson has suggested a plan which, if carried into effect, would at once tend to attain the object in view, and thereby prove conducive to the interests of all concerned, by giving a substantial guarantee to the farmer, and I am sure would wonderfully facilitate the business of the

seller, as well as adding to his pleasure and comfort in his business negotiations. The suggestion referred to was to this effect, that the seller of every artificial manure in Lincolnshire, or rather at this market (with the exception of those samples which are now already in the hands of Mr. Richardsoo, and of which a careful examination has been conducted), should forward the sample of the manure he has for sale to Professor Vöelcker for analysis, at that at the time of sale he should give a written guarantee that the delivery of the manure should be in accordance with such analysis, subject to non-payment for same manure in the event of Dr. Vöelcker finding any material commercial difference in the composition of the bulk delivered. I say material difference, because it is well known that in the case of all manufactured compound manures some slight accidental difference (caused either by an unfavourable drawing of the sample from the bulk, or some slight difference in degree of the material not having in the instance of the sample drawn been uniformly chemically acted upon) may exist, and Dr. Vöelcker's great and renowned experience in scientific examinations and inquiry is in itself a sufficient guarantee of his giving a good and sound judgment in the matter. I think every one present will admit that the best test of the value of a manure is its chemical analysis—at least, I may safely assume as a fact, which does not admit of cavil, that the money value of manures can alone be determined by chemical means—there is really no other way of ascertaining the market value of a manure than by means of the chemist's examination of the composition, unless, indeed, the farmer himself acquires a sufficient knowledge of analytical chemistry to enable him to analyze his soils and manures, and I know of no good reason why respectable farmers should not be instructed in the theory and practice of that science which must be regarded as the true exponent of his art. No artificial manure should, in my opinion, be purchased by the consumer without previously obtaining an analysis setting forth its exact composition. Testimonials, without a guarantee of analysis, are all very well in their way, but are seldom to be relied upon. In numberless cases the most worthless manures have been palmed upon the unsuspecting farmer by means of specious testimonials. A correct analysis can alone be depended upon; and even this, in not a few instances, proves unavailing. The analysis may be correct, but it is practically of no value to the farmer unless he understands it: and not only so, but a true statement of the composition of a bad specimen may, to him, appear that of a good one; and he may purchase the bad under the impression that, as an analysis is given at all, it is as a guarantee of the genuineness of the article. Relying upon this very natural mode of reasoning on the part of the purchaser, the fraudulent dealer resorts to this audacious experiment in order to avoid being prosecuted for selling otherwise than 'according to analysis;' but the watchful care of Dr. Vöelcker, when sought for, as well as that of other chemists of high agricultural chemical attainments, will provide a sufficient protection to the purchaser (at least from being led into this trap); without which protection, so long as buyers are unacquainted with even the elementary principles of chemistry, so long must we expect this system of imposition to be pursued: let us hope, however, that this is a state of things which will not long continue. If fraud is abroad seeking for prey, science is on its track to discover and disarm it; and even the agricultural part of the community, though so widely dispersed from the great urban centres of scientific light, cannot long remain in ignorance of that science which must be regarded as the farmer's best friend and safeguard, and

the true exponent of his noble art. Many farmers are in the habit of purchasing various kinds of guano and other artificial manures for the purpose of testing their comparative fertilising properties. Now, experimenting in the field with various kinds of manures is, no doubt, highly desirable, and frequently leads to very important practical results; but you should first obtain the chemist's opinion as to the composition of the manures (supposing you not to be previously acquainted with them) before you proceed to experiment with a variety that may prove to be completely worthless for the object in view. Haphazard experiments in agriculture should be avoided by every agriculturist who desires to farm profitably. No doubt many of you gentlemen present know of curious facts in connexion with field experiments; one with which I am acquainted (as it bears distinctly on the point we have now at issue), may be worth mentioning. Several experiments were tried this year at a large farm with which I am acquainted, to test the comparative fertilizing value of guano and other varieties of artificial manures; and, as a check upon the experiments, a portion of the crop was not sown with manure at all, and it was found that the heaviest crop of all was that grown upon the unmanured plot. (Hear, hear.) So much for badly arranged field experiments as a test of the fertilizing value of manures. The soil of the field in which these experiments were conducted was so extremely fertile, that the addition of manure produced no sensible effect upon the crop. In the experiment at Hibalstowe, so judiciously conducted by Mr. Richardson, such cautions have been instituted as to insure on its basis the result being due only to the various artificial manures applied, by wisely selecting a field which had been thoroughly exhausted, and which alone was fitted for the object in view, viz., to decide upon the comparative merits of the various manures under consideration (which was the only and true object in view), not that of producing the greatest weight of bulk attainable under any circumstances. The subject of adulteration of artificial manures is one the importance of which, to the agriculturist, can hardly be over-estimated; and although the question has occupied, of late years, the attention of several very distinguished chemists, and has been frequently brought under the notice of the farmer, still, I think, further public attention to the existence of the wide-spread (and, in some counties, well organized) system of adulteration, which so unfortunately at present prevails, imperatively calls for active interference to suppress it. It is, indeed, fortunate for the cultivators of the soil, that chemical science furnishes the means of detecting adulteration of every kind, no matter how skillfully it may have been accomplished; but it is to be regretted that so few, comparatively speaking, avail themselves of the boon. I hope, however, that this apathy amongst those most interested in the matter will not be of much longer continuance, and that no "penny wise and pound foolish" considerations, on the part of the farmer, will cause him to reject the aid of chemistry, a science which has thrown so much light into every intricacy of his avocations, and which is ever available to protect him from fraud and imposition. The money loss to the farmer in the purchase of the manure is not all; indeed, the useless expenditure of money in the purchase of worthless manure is the least loss which the farmer sustains. His loss is far greater; his time, the rent of his land, and the crops which he should have obtained had his manure been genuine, are all sacrificed to the unscrupulous cupidity of the dishonest manufacturer of spurious manures, and the no less dishonest dealer in the same article.

Mr. STEPHENSON proposed "The healths of the Unsuccessful Candidatea." While he admired the fair and honest manner in which the experiments had been carried out, and was glad that the best man had won it, it must not be forgotten that it had only been just won.

Mr. PACKER, representing Mr. Smalley, of Stockwith, responded. Although the firm which he had the honour to represent was not successful in obtaining a prize in this competition, still he was not ashamed of the position they occupied in it. They had produced, with the manure for which he was the agent, a very good crop of turnips, and he would say this in justice to all the competitors, that two better fields of turnips could not be found in the county than those upon which the experiment had been tried. This had not been a good season for the turnip crop; but the produce in those two fields—the soil he it remembered having been exhausted of all but its natural producing qualities—was more than an average. (Hear, hear). The experiment had undoubtedly been a triumph for Mr. Horner, and the experiment would, in his (Mr. Packer's) opinion, be attended with permanent benefit to the agricultural community. The test, he firmly believed, had been most impartially carried out. The prizes just presented had been most fairly won. As an unsuccessful competitor, he should very much like all the manures of the unsuccessful competitors should be analyzed, and he for one was quite ready to stand the test, and should be glad indeed to bear the expense of the analysis. He thought if Mr. Richardson would be good enough to send samples of all the manures entered in competition to Professor Vöelcker for analysis—the expense being borne by the unsuccessful competitors—they should all derive considerable benefit. All, he thought, would agree to this proposition for their own sakes and for the credit of the firms which they represented. Mr. Packer then dwelt at some length on what were the valuable constituents in manure—*i. e.*, phosphate for turnips, and ammonia for wheat—and said the only way to ascertain what were good and what were bad was by analysis. He then gave the health of Mr. Richardson, to whom he considered they were all, both farmers and vendors of manures, greatly indebted for the way in which he had originated and conducted to a termination the Hibaldstowe turnip experiment.

Mr. FRANCIS PAGE rose to order. He was known to many gentlemen there as the representative of Messrs. Morris, brothers, and Geves, and he had, he thought, some cause to complain: though all the speakers concurred in eulogising the manner in which the experiments had been carried on throughout, the house of which he was the agent ran second in the race—a fact which would have remained unnoticed but for a passing observation from Mr. Stephenson. Had not they who came forward voluntarily reason to expect a just amount of consideration at the hands of gentlemen present? The fact had not been alluded to, and it surely deserved notice. He felt it a duty on himself, and justice to his principals, to put them in their right position before that company. He wished that one member of the firm had been present to take up the toast and do justice to its merits. The low price of agricultural produce, as the chairman had stated, called for as low a price as possible on the part of the manure manufacturers. That suggestion had been anticipated by the firm he represented, the price of manure having been reduced 10s. per ton.

Mr. WALESBY (agent for Batchelor's manures) declared, in the midst of much laughter, that the manures which he represented would always beat the Phospho-Peruvian guano.

Mr. T. M. RICHARDSON, on rising to respond to the toast of his health, was loudly cheered. He said, alluding to Mr. Packer's suggestion that the manures of the unsuccessful com-

petitors in the experiment should be analyzed, he would willingly give up the portions in his possession for that purpose. The subject of the adulteration of manures was a subject of very great importance indeed to the farming public, and thought it could hardly be over-estimated. He could give an instance of this from his own experience: he was in the habit of using a manure at £12 per ton; but he got it analyzed, and found that he was paying £12 for what in reality was not worth more than £3 (Hear, hear.) This had made him wary. He would not purchase a manure now unless he received a guarantee, and even then he should consider it to be his duty to consult the chemist as to the truth of that guarantee. They had just been told that fraud was abroad seeking for prey, and ready to victimise the unwary. Then (said Mr. Richardson) I must appeal to you, my young brother sportsmen, and more particularly to our gallant Captain Rattler, to prepare for the hunt. Meet at the cross-roads of Imposition—let slip the dogs of Chemistry—put Science on the track of fraud, and hunt it out, not only from the coverts in which it now lurks and lies concealed, but also from every covert throughout the agricultural districts; and in the open field of honest trading, run into this sly and fleeing enemy, and nail his brush to the farmyard door of every cultivator of the soil.

Mr. RICHARD RICHARDSON, of West Firsby, proposed the health of Mr. Odams, the manager to the Nitro and Superphosphate Manure Company. He (Mr. Richardson) was very glad indeed to be enabled to bear personal testimony to the worth of those manures, and the skill and scientific knowledge displayed by Mr. Odams in their preparation, for on a very recent occasion he (Mr. Richardson) had the privilege of going over the manufactory of the company, in Plaistow Marshes, and he was then enabled to judge for himself. From what he then saw, he was enabled most truly to declare that more genuine and valuable fertilizers could not be than those prepared under the superintendence of Mr. Odams. And they had a sufficient guarantee of the respectability and *bona fide* character of the Superphosphate and Blood Manure Company in the fact of the board of directors being composed of such men as Mr. Jonas Webb; and in the additional fact that the shareholders and directors themselves represented no less than 300,000 acres of land.

Mr. ODAMS acknowledged the compliment, and said it had always been his aim and study to produce for the company manures of real value to the agriculturist, and it would always be his endeavour to make one of the best manures out.

Mr. PRATT said it would be in the recollection of the chairman that upon Mr. Richardson's advertisement appearing in the papers, which brought about this trial, he (Mr. Pratt) with others attended this ordinary; but the anxiety of competitors was so great that no place was left for him; consequently those who could not get in this public trial resolved to send half a ton each to Mr. Geo. Skelton, of Hibaldstowe, and upon inquiry of Mr. Skelton this day, he (Mr. Pratt) had been informed by him that from his (Mr. Pratt's) manure he had the best crop.—(Abridged from *The Lincoln Times*.)

The AVERAGE PRICE OF CORN, per Quarter (imperial measure), in England and Wales, for the Quarter ending Christmas, 1858:—

Wheat	41s. 9j.	Rye	31s. 10d.
Barley	35s. 2d.	Beans	42s. 11d.
Oats	23s. 3d.	Peas	44s. 8d.

PRESENTATION AND DINNER TO MR. DONALD, OF LINSTOCK.

When, at the last annual meeting of the East Cumberland Agricultural Society, it was announced that Mr. Thomas Donald, of Linstock, after having assiduously and gratuitously laboured as Secretary for twenty-five years, had retired from that post, it was generally felt that some public mark of respect was demanded by his long and valuable services to the Association. Mr. Donald's high private character, and the wide esteem which his public spirit and integrity have secured, aided the movement, and many persons who were not directly connected with the agricultural society gladly availed themselves of the opportunity to testify their regard for his personal worth. With but little effort, therefore, a sum of about 150*l.* was obtained, and, under the direction of a committee, a massive silver salver, an elegant silver coffee pot, a silver claret-jug, and a gold watch and chain were purchased as suitable testimonials to remind Mr. Donald of the number of his friends and the estimation in which they held him. The presentation took place on Saturday, Jan. 15, at a public dinner in Carlisle.

The salver or coffee tray is oval in shape, and richly chased, having a scroll and shield in the centre, containing the inscription. The claret-jug—which is of the antique shape, and the coffee-pot, are both richly chased. The following inscription is engraved upon the articles:—

Presented to
THOMAS DONALD, ESQ.,
by the Members of the
East Cumberland Agricultural Society,
and other Friends,
as a Token of their Appreciation of his Valuable Services
as Honorary Secretary to that Society
during a period of 25 Years.
January 15, 1859.

The dinner took place at the Royal Hotel, where the large room was tastefully decorated for the occasion. On the end wall, surrounded by a border of evergreens, hung a large banner, bearing the motto "Prosperity to the East Cumberland Agricultural Society." On each side of this, and arranged at intervals down the room, were bannerets with armorial bearings. Other large flags adorned the walls, bearing such mottoes as "Our Queen and Country," "Success to Agriculture," &c., and the Royal arms furnished the other end of the room. The coffee-pot and claret-jug were placed on the salver, on the table before the chairman. Captain James, of Lothian Gill, presided, and John Birkett, Esq., of Broomhill, occupied the vice-chair.

After the usual loyal toasts were disposed of, the CHAIRMAN thus gave the toast of the evening: I believe I am now called upon to exercise the right which you have perhaps in too flattering a manner confided to me, in electing me as the organ of expressing your feelings towards an old friend. And I really was not aware, until I saw the long list before me, how embarrassing it was. Although I do not feel it embarrassing to address a public assembly when I have only my own feelings to express, I feel that on the present occasion my powers are not sufficient. I have not ability, and assuredly I cannot command sufficient eloquence, to express the feelings which animate each one of you, and the large body of subscribers—a list of whom I hold in my hand—who have thus intended to express their feelings of admiration for our friend

Mr. Donald, who, as the Mayor has rightly expressed it, is the hero of the evening. For a long series of years he has been the unpaid, the very active, and, I may add, the very patient servant of the East Cumberland Agricultural Society. The exact period of his services I am unable to state, except by looking at the very elegant inscription before me. His service dates back twenty-five years—long before I, although now going on for nearly twenty years' acquaintance with agriculture, had anything to do with it. Before I had anything to do with attending agricultural meetings it appears that Mr. Donald, who must then have been a very young man, was secretary of the Society, and the friends of agriculture then presented him with what was a very good specimen of the work of the time—a tea service; and I understand that this (holding up the coffee-pot) is the only article wanted to complete it. Why the coffee-pot was omitted before, I cannot say; but the merits of Mr. Donald at that time commanded only a tea service, and it is left for us to complete the service, and provide him with what all will admit to be a nice specimen as a work of art—a coffee-pot. But, gentlemen, I trust Mr. Donald will not estimate our respect by the intrinsic value of the articles presented, but consider them as a poor, inadequate, expression of the very high regard in which we hold him. Nor do we hold him in that high regard lightly; but for those qualities which will among all nations and in all countries command esteem. I confess it has struck me occasionally and I could never reconcile it to myself how he managed the discordant element that all of you know you meet on the show-ground. Long before this presentation I watched, and of course if I watched I found it out. I found that angry exhibitors, persons too late to enter, impatient judges, who had missed the train, and all the other difficulties, were overcome by the exhibition of good temper and tact. (Cheers and laughter). Now, gentlemen, tact is a thing which, like poetry, is born with a man, and our friend Mr. Donald is a very lucky man to be born the possessor of tact and patience. I think a lesson is to be taken from him, and if there are any in this room younger than myself, which I fancy there will be, I may be allowed to recommend them so to keep Mr. Donald in mind; and when they are spoken to, as I have heard Mr. Donald spoken to, in a hasty and petulant manner, let them take care not to answer too hastily. I believe this has been the secret of our friend—only to answer at the right time. I trust, however, the career of Mr. Donald is not finished, and that he will be an assistant at our Agricultural Society, although he ceases to be its gratuitous servant. I trust that after expressing our feelings towards him—something may have taken place already—I may venture to express a hope that when he rises to return thanks, he will inform us that he has resolved no longer to delay the period of settling himself in life. It is a serious and somewhat delicate point to touch on, but having lived in a healthy country, and being the father of ten children, if I can't venture upon it, who can? What is the use of a coffee-pot without a helpmate? I can understand the use of the other (the claret jug); for that a bachelor may use too well and too often. It only remains for me now, lamenting as I do my want of power in expressing your feelings, to present to Mr. Donald something that will remind him each day, when he puts his hand into his waistcoat-pocket,

that he unites in himself the concentration of the feelings of a very large number of friends, not by any means expressed by the number in this room, because it accommodates but a limited number, and there is a large number of subscribers who, from unavoidable causes, are prevented from attending here this day. If he will permit me to take the liberty, I will put it on, and I trust it will remind him that worth, virtue, and honesty are not always in this world, however inadequately, unrewarded. The Chairman then proposed Mr. Donald's health, which was drunk with great enthusiasm.

Mr. DONALD then rose and was received with loud cheers. He said—Mr. Chairman, Mr. Vice-chairman, and gentlemen, it has been said, and I think with some truth, that when the heart feels most the tongue has the greatest difficulty in expressing. And if I was ever placed in a situation where more than under ordinary circumstances I had an opportunity of feeling the full force of that truth, the present is that occasion. I feel, gentlemen, that merely to thank the worthy chairman for the very flattering terms he has been pleased to apply to me would be but a poor expression of my feelings. But be assured I will remember to the last day of my life the very flattering manner in which you have conveyed to me this valuable testimonial. The value, according to its intrinsic worth is great; but it has a higher value in my estimation, as it conveys to me in language which could not be misunderstood, that during the long time I have acted as secretary of the East Cumberland Agricultural Society I have met with your approbation; and shows to me in a way in which there can be no mistake, that I am in possession of your respect and esteem, which I value at a much higher price than silver or gold. Gentlemen, I have sometimes thought, and I assure you it is without affectation, that some one who could have carried more energy into the business than I was possessed of, would have made a more efficient servant in the interests of the society; but after the proceedings of this day I may perhaps be vain enough to think that I had formed a wrong opinion. We have sometimes heard of the want of public gratitude, but I have seen that when any man has had a just claim on the public he has never gone unrewarded. This must be encouraging to my successor, who possesses zeal and ability, and if to this he will add patient perseverance, when he retires from office at the end of five-and-twenty years he need not fear that his services will be forgotten. Gentlemen, during the long time I have acted with you it has been my fortune to be associated with four treasurers. First, there was the late Mr. Bowman, whom you all knew very well. He had been the treasurer for other societies before, and a more exact and painstaking treasurer could not be, and I have often wondered how at his great age he could manage the work. Then came the late Mr. Farish, than whom a more worthy man never lived. He was succeeded by the late Mr. Rome, a spirited farmer, and most active treasurer; but unfortunately, like his predecessors, his health and strength were not equal to the work he had before him. Gentlemen, we have now my friend Mr. Dalton. I cannot in his presence say all I would say about him; but I will say, and I believe I only express the feelings and sentiment of this company when I say, that I wish he may long live to discharge the duties of treasurer with credit to himself and benefit to the society. The benefit produced by agricultural societies is now so universally admitted that it need not be insisted on here. Whatever produces emulation and

competition will necessarily produce improvement, and we all know that many agriculturists think their own things best at home; but when they bring them to be compared with others, they are stimulated to further improvement. So with crops. They think their own best until compared with others, and then they are dissatisfied with the opinions of the judges. I have always found it would be more easy to be successful in gaining a prize if I had not anybody to compete with me. In green crops I had twice the good fortune to be successful, although Mr. Rome and Mr. Forster, of Moorhouse Hall, were my competitors. They had both very good turnips, and did not believe they had been well treated; but they came and saw my crop, and then they both caudly admitted that they were fairly beaten. Another year I had a crop, and, puffed up by my success, I again entered the lists with Mr. Rome as a competitor; but he, having profited by the experience of the former year, had put on the whole steam, and beat me, so that I have never since ventured to enter the lists again. Gentlemen, you are aware we have sometimes heard complaints by parties of the partiality of the judges. That the judges do very often err there can be no question; if they never erred, they would be more than human. No one had a better opportunity of forming an opinion of their judgments than myself. I have known them come and ask me to whom the animals belonged to which they had awarded the prizes; while, at the same time, they were accused of partiality. Gentlemen, it has sometimes even been hinted that politics had something to do with it; but I have no hesitation in saying that, so far as I was concerned, or the committee that managed the business of the Society, not a shadow of politics ever interfered with us. And when I look round this room, and see so many gentlemen of different shades of political opinion, I cannot but feel that I am confirmed in my statement. Our friend the Chairman has political opinions of his own; and as to my friend the Vice-Chairman, nobody has any doubt about his opinions. Though he and I differ always in politics, we agree in everything. This may seem a paradox to some, who are not aware that we agree to differ in politics. Gentlemen, I think we would have arrived at a strange state of things if gentlemen could not meet at an agricultural society, or at a meeting like this, without being soured by the demon of politics. Gentlemen, I can't say, in answer to our worthy chairman, that anything is settled in the way he recommended; but his kind advice, allow me to tell you, will encourage me to hope that the exertions which from this time I may set about will, before long, be successful. Gentlemen, for the very kind and liberal way in which you have treated me, I really cannot find words to express my feelings as I could wish. I cannot, indeed, tell you how I thank you. When I look at that splendid salver, I am inclined to say, as Cardinal Wolsey said to Henry VIII., "You have made me too great for my house." And when I look at that beautiful coffee-pot and claret-jug, I feel you have given me additional means of entertaining my kind friends, when you give me a visit; and I hope that, when you come, you will not say, "I hope it will be the last visit." When I look at this valuable watch, and see how time is flying, it will be a warning to me that time is on the wing; and every time I look at it, it will remind me of what I never can forget, the deep debt of gratitude I owe to my very kind and very numerous friends (loud cheers).

PRESENTATION OF A TESTIMONIAL TO MR. JOHN CLARKE,
OF LONG SUTTON.

At the tenth anniversary of the Long Sutton Association for the Prosecution of Felons, held Jan. 23rd, 1837, it was resolved to establish an Agricultural Association forthwith. This was immediately done, and Mr. John Clarke appointed Honorary Secretary; an office which he has now held for twenty-two years, with much benefit to the Society and the district. It having lately been determined to offer him some testimonial of his friends' respect, the anniversary of the above Association was chosen as the most appropriate day for its presentation. The Chairman of the day was Robert Mossop, Esq., who, in a very able and complimentary speech, enumerated many of the local objects which Mr. Clarke had aided by his efforts, as well as the Association with which he stood more immediately connected—concluding amidst the plaudits of a large assemblage by presenting the testimonial, consisting of a very chaste and beautiful ormolu timepiece, a splendid tea-service, and a massive salver, highly ornamented.

Mr. John Clarke, in acknowledgement, said, I beg, sir, to thank you for permitting us of the Long Sutton Agricultural Association the privilege of using this day for our purpose. I know you have always encouraged any useful project which could be brought forward at your meetings. From this meeting emanated our Agricultural Society, the Gas Company, the Corn Exchange Company, and many minor things, as coal clubs, and the like. I thank you most sincerely for the kind and appropriate manner in which you have on behalf of the subscribers and this meeting conveyed to me those beautiful articles of plate on the side-board. I esteem it a great honour. I believe I am the first individual in this district that has ever had such an honour conferred upon him: we have had testimonials presented, but they have all been of a more private or local character—from private friends, members of congregations to their minister, bodies of tenantry to their landlords or agents, fellow-parishioners; but mine is from the district, from the general public, which to me makes the honour greater. I am most happy to receive it through your instrumentality. To Mr. Prest and the Committee, I feel under great obligations for the trouble they have taken to do me this honour. I know what difficulties arise in collecting subscriptions: many are disposed to aid; but if an active committee-man is not at hand to receive the sovereign, it lies quietly in the purse, and the thing is passed by. I thank you for using such a wise discretion in selecting such beautiful articles, so useful, so ornamental. My prepossession was to build a model cottage; but I thank you for preventing me embroiling my hands in bricks and mortar. I thank you for acceding to my wish to have it in three pieces, because I wish to hand to each of my three children an heirloom, to show them in aftertime that their parent did once obtain the favour and approval of his friends and neighbours for efforts of a public character, and that it might stimulate them to activity and usefulness through life. I wish also to name another member of the committee—I mean Mr. E. Cole, to whom I am indebted as the proposer of this testimonial. I beg also to congratulate him on a similar token of approval awaiting his acceptance. I know, my dear sir, that we are now both marked men; you are to receive a testimonial for your private worth, your obliging and attentive business-

habits; mine is for public usefulness. I trust we shall not forfeit the good opinion shown toward us; but that we may each fulfil our stations with honour, and prove ourselves an example to others. To Mr. W. Skelton, our esteemed President, I am greatly indebted for his steady support, and the great encouragement and assistance he has rendered me throughout the whole period of the society's existence. It was by his help, and that of some few others, that in times of great agricultural difficulty, we were kept together. To the Stewards I have been under very great obligations, and there is one whom I desire more to particularize—I mean Mr. John Peele. We have acted together from the commencement for twenty-two years; we have acted harmoniously and laboriously. I thank him for his counsel; for his great liberality; for his determination to overcome and live down all difficulties. Recollect that in the depressed times all the other societies around us were given up—Wisbeach, Spalding, Deeping Fen, Bourne, Boston, Wrangle, Holbeach—all fell in, but Mr. Peele would never give up. To Messrs. Allenby, Booth, Horn, Neatheringham, and Mr. E. D. Skelton, I tender my best thanks. Others have done well, but you never had a class of Stewards equal to these gentlemen. They have duties, and they fulfil them. In judging allotments, drilling, and setting out work, and managing our large meetings, they merit your high approval—they do it admirably. To Mr. John Thomas Marshall I owe many thanks for taking the educational department, and greatly relieving me from many duties; for this Society has this novel feature in its operations—the education of the agricultural community, the labouring population. To the present meeting I offer my best thanks for your kind attention. I thank you for these expressions of your high opinion. I should think my mind sadly regulated if I could be indifferent to such manifestations. I know your public spirit. I know of no district having so many good institutions, or whose inhabitants are so ready to aid each other. And in these matters you do nothing by halves: your Society is unexampled for its comprehensive prize list; your little town you improve at all quarters till you have made it the pride of the low country; your Corn Exchange is a pattern to the whole country; and the testimonial you give is the most acceptable, the most splendid and useful it was ever the lot of any one in the district to receive. I have one more name, one gentleman whose name I wish particularly to bring before you; I mean my co-worker and colleague, Mr. John Swain. He has now been associated with me for fourteen years: a great part of that time as joint secretary: he has done nearly all the work—keeping accounts, collecting subscriptions, managing certificates, and most of the details of the Association—for which I beg to offer him my sincere thanks. Moreover, he is the treasurer and secretary of this testimonial fund: it is to his energy and management that much is due. I have ever found him a most useful and disinterested fellow-labourer, and I don't know one amongst us who makes himself more generally useful, and but for whose help I must long ago have resigned. I beg, Sir, to conclude by proposing his health, with best wishes for his prosperity.

In the course of the evening, Mr. Clarke gave an interesting sketch of his career, for which, however, we have not room this month.

THE FOOD OF PLANTS.

The ancients inquired, by very laborious researches, into the nature of vegetable growth; but the results were very unsatisfactory. The transmutation of air into the different bodies was held as an undoubted truth by Epicurus and Pythagoras; and Lucretius, in the beautiful poem, "De Rerum Natura," affirms the constant change of air into other substances which are resolved into air, and which is again decomposed into bodies by a continual and never-ceasing rotation. Anaximenes also believed that all bodies were formed of air, or of aerial matters. Among the moderns, Lawrence contended for fire, Helmont for water, Bradley for air, and others for earth and nitre; and this uncertainty continued till more recent discoveries found that liquids, carbonaceous, gaseous, and other substances entered into the food of plants, and that water and air are compound substances—the former consisting of two elastic fluids or gases, viz., inflammable air or hydrogen, and vital gas or oxygen, or the oxide of hydrogen, and in weight 1 + 8 of oxygen; and the latter of two gases, oxygen and azote, and small quantities of aqueous vapour and of carbonic-acid gas—this last substance being itself a compound elastic fluid, consisting of charcoal dissolved in oxygen. Tull thought that the earth reduced to very minute particles supplied the nourishment to vegetables, by attracting much moisture in that comminuted state; and that manures only acted mechanically in improving the texture and in crumbling the particles, and thus increasing the power of attraction. Duhamel adopted these opinions, and thought manures unnecessary; but he lived long enough to abandon that notion, and he finally concluded that no single material composed the food of plants. Succeeding philosophers have made many experiments on the growth of vegetables in different situations, in light and in darkness, and placed in substances of different qualities; and the results satisfied them that light and atmospheric air have great influence, and that water is essentially necessary to organized bodies, as without it no circulation of juices can be carried on, though it be only reckoned a vehicle, and not to constitute any part of the food itself. Ingenhousz contended for atmospheric air by many very ingenious reasonings, which have not yet been clearly proved or understood. Hassenfratz argued for carbon or charcoal being the chief food of plants, and derived from the soil by the roots, supplied to them in a state of solution or suspension from the brown sediment of dung after evaporation. This opinion was adopted by Kirwan, with the difference of supposing that plants derived carbon from the air by the act of vegetation, as carbonic acid gas is easily resolved into its two ingredients, oxygen and carbon. But common air has been shown to contain only a thousandth part of its bulk of carbonic acid gas, or, according to Lavoisier, none at all;

and carbon forms only one-fourth part of the fixed air itself. And it is doubtful if the brown mud of dung remaining after evaporation can be reckoned real coal without undergoing the action of fire; it may rather be called an extract, as it may be again diffused through water, or dissolved as it was before the evaporation. Saussure would lead us to believe that plants obtain their earths from the soil; for beans, supported by distilled water, yielded only one-third of the quantity of ashes afforded by those grown in the soil; while those fed by rain-water gave little more than one-half of the latter quantity.

Thirty-two ounces of dry corn contained earths and metallic oxides as under—

	Wheat.	Rye.	Barley.	Oats.
Carbonate of lime	12.6	13.4	24.8	33.75
Silica	13.2	15.6	66.7	144.2
Carbonate of magnesia	13.4	14.2	25.3	33.9
Alumina	0.6	1.4	4.2	4.5
Oxide of manganese	5.0	3.2	6.7	6.95
Oxide of iron	2.5	0.9	3.8	4.5

One hundred parts of ashes lixiviated gave as under—

	Silex.	Calx and Muritic.	Argil.
Wheat	48	37	15
Barley	69	16	15
Oats	68	26	6
Bear or bere	65	25	10
Rye	63	21	16
Potatoes	4	66	30
Red clover	37	33	30

Schröder seems to prove that a part of the earths must be derived from vegetation, even where plants are deprived of any opportunity of deriving fixed principles from the soils where they grow. He planted vegetables in sulphur and in the oxides of antimony and zinc, containing no earthy matter, and placed them in boxes, with free access of light and air, with dust and rain excluded, and fed them with distilled water. He found that the plants contained more earthy matter than the seed from which they grew, and which he had previously analyzed and ascertained the constituent parts. Plants growing in distilled water, and with free access of light and air, nearly doubled the portion of carbon they originally contained; but with little share of light, it was diminished from the latter quantity; and hence the plants must have derived nourishment from the air. But as they never perfect seeds, and soon decay, it is evident that air and water alone cannot support healthy and productive vegetation. Plants draw earthy matter from soils where no earths of that kind exist; as much as 65 per cent. of lime has been found in plants, of which substance no traces could be found in the ground; and silica also, though none existed where the plants grew.

It has been found, by experiment, that plants do not absorb solutions of saline substances indiscriminately;

it may depend more on the degree of liquidity than on any discriminating power in the root; but we are wholly unable to explain that so much greater a portion of water should be absorbed than of the salt held in solution. Saussure concluded that it does not so much depend on the earths which constitute the soil, as on the quantity of earths held in solution by the liquid part of it. So that earthy and saline matters existing in the soil, and being always found in plants, we can scarcely help considering them as a substance necessary to the growth of plants; but without manures, no earths, salts, air, or water will support their proper growth. Glibert mixed four earths—silica, alumina, lime, and magnesia—in proportions to constitute a fertile soil, and supplied the plants growing in them with water; but none grew till he applied water from a dung-hill. Lampadius planted vegetables in one pure earth, and supplied them with dung-hill water; they grew and contained the usual earthy matters, notwithstanding the total absence of any of them in the soil. Plants have been resolved by chemical analysis, but no satisfactory conclusions as to what substances they derive from the earth as nourishment can be drawn from a knowledge of the constituent parts of organization. If a plant be strongly heated in a close vessel, allowing only smoke to escape, the residue is always the same, and is called charcoal or carbon by the chemists; of this carbonaceous matter a considerable quantity is always found in garden-moulds and in rich lands, derived no doubt from the remains of vegetable substances of which the mould was originally formed. It is insoluble in water, and cannot enter in that state into plants; hence we may suppose that it is rendered acceptable to their pores by a variety of changes and combinations. Vegetable mould is a loose black mass, obtained from plants putrified in the open air without any mixture of animal matter; it causes plants to grow with great vigour, and must contain or constitute of itself a great source of nutriment. New countries owe their fertility to this substance. When exposed to continued cultivation it is dissipated, and the soil is impoverished. Two hundred grains of oak mould distilled, and the same quantity of undecayed oak, gave as under:

	MOULD.	OAK.
	Inches (Fr.)	(Fr.)
Carburetted hydrogen gas	124	116
Carbonic acid.....	34	29
	Grains (Fr.)	
Water containing pyroliguate of ammonia.....	53	30
Empyreumatic oil.....	10	13
Charcoal	51	41½
Ashes.....	8	0½

Mould, and the vegetables from which it is derived, give nearly the same results; but mould contains more charcoal than the vegetables, and more ammonia, and consequently more azote.

Plants contain but few elements in their construction and organization, and are chiefly composed of charcoal and aeriform matter. They give, by distillation, volatile compounds, of which the elements are pure air, inflammable air, coaly matter, and azote, or that elastic substance which forms a great part of the atmosphere,

and is incapable of supporting combustion. They derive these elements either by their leaves from the air, or by their roots from the soil; and the sap, which nourishes the plant, and is finally converted into substance, in order to add to its bulk by extension of parts, is derived from water or from the fluids of the soil, and is altered by, and combined with, principles derived from the atmosphere. The principles of vegetable matter contained by manures from organized substances are, during putrefaction, rendered either soluble in water or ceriform; and in these states they are capable of being assimilated to the vegetable organs. No one principle affords the pabulum of vegetable life: it is neither charcoal nor azote nor hydrogen alone, nor oxygen, but all of them together, in various states and combinations (*Davy*).

The fixed alkalis consist of pure air and highly inflammable metallic substances; but there is no reason to suppose that they are resolved into their elements, in any of the processes of vegetation.

Elastic fluids are by some thought to constitute the chief food of plants, and the principal cause of the fertility of soils. Carbon, being the only fixed ingredient in plants, is insoluble in water or in the acids of the soil, and only in combination with azote and oxygen. Heat is very favourable, as without its agency no substance can assume the gaseous forms.

Oils have also been supposed to enter into the food of plants, as some oily productions are found to be great improvers of land; but oils are not miscible with water, and must suppose the presence in the soil of lime, chalk, marl, or soap-ashes, to convert them into a transmissible state.

The earths are not convertible into the elements of organized compounds—carbon, hydrogen, and azote. They consume very small quantities of earth, found in their ashes, and are not converted into new products. They give hardness and firmness to the organization in an epidermis of siliceous earth, and strengthen and protect it from the attacks of insects and of parasitical plants. Soils and their bases, the metals with oxygen, are not altered in vegetation: they may be corrected by a modification of their earthy constituents, by probably affording a better receptacle for the absorption, retention, and giving off of moisture, and the means of useful and fertilizing combinations.

Experiments have been quoted to show that the soil exerts a powerful influence on the quality of metallic oxides contained in the plants; for, though the composition of the ashes differ, the quantity of oxygen contained in all the bases is the same, or an equal number of equivalents of metallic oxides. And hence the opinion has been entertained, that plants do not produce any inorganic substances, alkalis, or metallic oxides.

Carbonaceous matter, in all active manures, must be in a state of combination soluble in water; and lime also, pure or in a state of salt. Magnesia and alumina may be rendered so by means of carbonic-acid gas; and silica may be dissolved in water: and though we cannot comprehend the different changes and combinations, we may conclude water to be the prime agent. The pro-

portion of earthy matters in plants is considerably influenced by the soil on which they grow; but whether they derive the whole of these fixed principles from the soil, or form them partly by some unknown powers of vegetation, has not been satisfactorily ascertained. Some would lead us to believe that all the earths are derived from the soil; others, that a portion at least is derived from vegetation, as in the case of plants wholly removed from the soil. But plants removed from contact of the earth do not arrive at maturity, or produce fruit, and contain much less carbonaceous matter than others of the same kind.

Plants decompose common air, and change it into carbonic-acid gas, forming carbon for the use of the plant. In light, oxygen is given out by the leaves of plants, and hydrogen retained; in the dark, oxygen is inhaled, and hydrogen given out. But coal constitutes only one-third—or, according to Lavoisier, 28-100ths of carbonic-acid gas; and the atmosphere contains only a thousandth part of fixed air, or, as before mentioned, according to Lavoisier, none at all.

In Hassenfratz's theory the difficulty lies in accounting for the quantity of carbon that trees find in one place, as they have no locomotive powers to go, like animals, in search of food. But both that writer and Ingenhousz are candid enough to admit that both the earth and air may combine in affording materials for the growth of plants.

It has been long and very generally supposed, by vegetable physiologists, that "humus" and its modifications formed the chief food of plants, and that alkalis were necessary to promote the decomposition. The name of "humus" was applied to the vegetable layer, or mould, arising from the putrefaction of organic substances, the quantity and quality of it indicating the fertility or barrenness of soils. But, properly speaking, humus is only a particular portion of the vegetable layer in a certain state of preservation, and does not extend to the stratum of mould that has generally received that name; consisting of vegetable matters, partly decomposed, but not completely disorganized; resembling a plant without organization pervading and nourishing others. Humus being slightly soluble in water, it was supposed to yield materials capable of being absorbed by the roots of plants, and the soluble parts were called "humic acid," and the insoluble "humin," or coal of humus; carbon being, as usual, the chief constituent element. But it has been found that humus requires 2,500 times its own weight of water to dissolve it—a much greater quantity than nature affords; and the very trifling portion of alkalis in many soils would be insufficient to yield any great supply of carbon from that source. On lands that are regularly mown, humus increases, and yields as much carbon as manured grounds. It is thence conjectured that the air supplies the carbon, as it has been incontestably proved that plants imbibe carbonic-acid gas, retain the carbon, and emit the oxygen. Water is a prime agent, and the elements of it may be decomposed and assimilated by plants at the same time. From the very small quantity of carbonic-acid gas in the air, and of carbon with the gas itself, it

may be supposed that the vegetative process possesses the power both of assimilation and of augmentation. Experiments made by supplying carbonic acid and water to plants failed, because other necessary ingredients were wanting. The decaying vegetable matter, by converting the oxygen into carbonic acid, affords the first food to plants till the leaves are able to perform the functions of inhalation. The carbon is thus derived from two sources: from the humus in the soil in the first place, and then from the atmosphere.

Ammonia, in different forms, is a powerful promoter of vegetation, and is thought to afford the nitrogen to plants, being itself a compound of nitrogen and hydrogen; or, ammonia $17 = 14$ nitrogen \times 3 hydrogen. Ammonia exists largely in manures of various kinds, and in plants it forms several colours; it abounds in the last products of all animal substances, and in rain and in snow-water; the smell exhaled by the ground after the melting of snow most sensibly showing its presence. The use of gypsum, charcoal, and burned clay arises from their fixing and retaining ammonia; and oxides and ferruginous matters also possess that property. It has been supposed that manures act only by the formation of ammonia; but nitrogen, or the product of ammonia, exists sparingly in vegetables, and with the nature of that elementary body, whether it be simple or compound, we are, as yet, very imperfectly acquainted. Plants contain a great preponderance of carbon over the azote, and animal bodies the contrary; and pure vegetable substances are doubted to contain any azote. Such is the uncertainty that attends the most plausible theory on this subject.

It has been supposed by several eminent physiologists, that plants eject fæces like animals, and that the excrements are converted into humus by exposure and cultivation. It has also been supposed that the fecal exudations of one plant supply food to another that is of a wholly different kind, and that the benefits of alternate cropping are derived from that source. But no instance is known, in the animal world, of any one individual deriving its support directly from the excrements of another; it seems to be repugnant to the laws of Nature, until the substance has undergone many modifications, and has been converted by the process of assimilation into animal and vegetable food. The theory is only a modification of the old hypothesis, that plants have a power of choosing and rejecting, and that different plants require different food. The excrements are supposed to restore to the soil the carbon they derived from the humus during the early period of growth, and alkalis and ashes may hasten the decomposition; but it is still uncertain if the exudations be derived from the soil, or from some other source, or formed by the plant itself; and until that be ascertained no certainty can exist of the justness of the theory.

Experiment has not yet decided if soluble animal and vegetable matter passes unaltered into plants, and becomes a part of their organization. If it does pass, it must be by many combined and unseen agencies; and it is very probable that water, air, and earth, although they do not singly afford the food of plants, all of them

operate in the process of vegetation. It is probable that we are yet unacquainted with any of the true elements of matter; for general substances, that were formerly thought simple, have been decomposed, and the most recent discoveries are by no means sufficient to penetrate into the deep mysteries of organized life, and it is doubtful if the propagation of vegetables has been in any degree rendered more intelligible or easier of comprehension. The original vegetables—lichens and mosses—that grew on the naked decomposing rock, could have little other food than water and atmospheric air; and, though chemists yet regard carbon as a simple and uncombined substance, and have found it in water and in air only in a very minute degree, but by some supposed to be decomposable, we may very reasonably think that water and air are the chief ingredients of the food of plants; and, if the conclusion be true, it is more curious in speculation than in practice, for it is certain that no plants can be raised to perfection without the aid of vegetable mould. Plants growing in a rich soil must derive nourishment from it in some way; for if removed to one less fertile, they decay, and often die quickly. Sap is ascending and descending; rises in the spring to the leaves, where it is elaborated, and undergoes some change, and descends to every part of the plant, becomes a part of the substance, and adds to the bulk. Sap is also changed at the first entrance by the vessels of the roots; for grafted plants can derive from the common stock the sap peculiar to itself. But what that sap, or food, or substance is, we have not been able to discover, owing to the minuteness of the rootlets, fibres, tubes, and pores, which almost escape detection by the microscope; and it may be very reasonably presumed to be in a state of solution as it ascends the organs in a liquid form. But in what way, or by what peculiar operation, the soil and manures yield the food in a liquid, or in any other form, and become so highly conducive to the growth of plants, is a point of very difficult research, and all the conclusions yet formed on the subject must be regarded as matters of very doubtful speculation. Fortunately, the importance of being known seems much less than the difficulty of obtaining the knowledge; for, if we were in possession of the latter as amply as could be wished, it is doubtful if any useful result would be derived, or if it would not rather remain a part of the ostentation of science, containing most beautiful scientific truths, but totally irreducible to practice.

In the present generally received opinion of the action of manures, it is supposed they exert an influence in several ways—in imparting the matters they contain that are favourable to the growth of plants, and also by adding by future decomposition to the quantity of vegetable matter already in the soil, and thereby increasing the fertility by operating upon other matters in the soil, breaking the texture, and setting at liberty other ingredients, and forming new combinations favourable to the growth of vegetable life, and by producing changes and alterations in the constitution of the soil, and bringing it into a more proper condition for yielding food to plants, and also by acting partly in all the dif-

ferent ways now mentioned. Thus, it may be said that some manures afford nourishment only; others yield nourishment, and, by leaving an earthy residue, add to the bulk of the soil; and others, again, do not nourish in their own nature, but exert an agency on other substances, and convert them into food for plants; and there is probably no manure that does not operate in more ways than one. These supposed modes of operation are resolved into the mechanical and chemical agency of manures: the first, by reducing the texture, dividing the earthy particles, and rendering the soil more open and porous, and in other cases more firm and compact, and adding to it by decomposition; and the second operates by the chemical attraction and affinities which different ingredients brought into contact exert on each other and on the soil, forming new combinations, and producing æiform or elastic fluids by means of the heat generated in the soil during the operation of the chemical combinations—thus joining with the mechanical agency in producing a state of action highly conducive to the growth of plants.

The decrease in the quantity of produce on land by the ceasing of the action of manures may be accounted for by the chemical affinities having exhausted their activity, and every particle of the earth being at rest, and no more heat being generated to produce the elastic fluids. And as experience has ever shown that the benefits derived from the use of manures are generally in a direct ratio with the quantity applied, and with the character of the upper soil with respect to quality and depth, it may be concluded that the superiority of manures in the latter case arises from the greater quantities of each substance affording a greater number of affinities and combinations that promote the growth of plants. And experience has also taught that if manures of any kind be applied to any subsoil prepared as the upper soil generally is, no such fertilizing effects will ensue; that subsoils differ in quality, and that some are very pernicious to vegetation, and require long exposure, working, and manuring to dispel the noxious qualities. And it may be inferred that the failure in the action of the manures arises from the substances brought into contact having less chemical affinity, and consequently not forming the combinations that are necessary for the growth of plants, and that the upper stratum, or cultivable soil, has undergone a long series of preparations, which has fitted it for entering into immediate action with the manures applied to furnish food for vegetables; and the mode of that preparation may never be known. The action of manures, and the benefits derived from them, are much affected and modified by local circumstances and external agencies, and by a soil too wet or too dry, and by a climate being too dry or too humid; and as similar constitutional qualities in soils are rendered very different by these causes, many cases will find that manures are similarly affected, and give proportional results.

It seems evident that organic matter furnishes food for plants; and recent chemical analysis has found the impoverishing effects inflicted on soils by cropping to consist in a diminution of that substance, and not of

any of the earthy constituents. The insensible progress of fermentation and the suction of vegetables impoverish it, and deprive it of organic remains, and leave the metallic residue or earths, forming very poor soils, and ochres where the ferruginous principle abounds. The organic matter would seem destined to repair the losses of the vegetable kingdom, and the earthy residue that of the mineral; for there we find diamonds, spars, and gypsum, and similar productions.

The pure earthy part of dung is very small, and, after a perfect putrefaction, bears an inconsiderable proportion to the soil it was intended to manure. The great use of soils seems to be in affording a bed to plants, in which to fix the roots, and derive nourishment slowly and gradually by the roots from the earth and from atmospheric air. In order to account for the presence of carbon in plants, it is supposed that vegetables decompose carbonic acid at the same time with water, and absorbs its carbon; but this supposition has not been proved, though it has gained strength since the decomposition of carbonic acid combined with soda by means of phosphorus has been discovered. Others are of opinion that vegetables, earths, moulds, and water of dunghills furnish the carbon attenuated and even dissolved in water; that plants absorb it, and do not extract it from carbonic acid. According to this hypothesis, manures afford only carbon, and the water is nothing more than a saturated solution of this principle. To these data the theory of vegetation is at present restricted.

Four earths have been found in plants—lime and silica most abundantly, and magnesia and alumina in much less quantities. All the alkalies have been found in the fluids of animals: potash not very common; soda in all fluids combined with albumen; ammonia in urine, and during its decomposition. And of the earths are found lime, magnesia, and silica; and of the metals, iron in blood, and manganese in hair. None of the earths are simple substances, and animals have a power of forming them by the process of digestion. And it seems very probable that plants have a power of forming earths and other substances from their principles absorbed by the roots from the earth or from the atmosphere. Hence solution by chemical analysis of the constituent parts of the organization of animals, and our knowledge of the nature of the substances that compose it, have not given any information in respect of the food which should be supplied to them: they possess the instinctive power of choosing and rejecting by smell and taste, and thereby teach what articles are most agreeable to them, and consequently most suitable for promoting their growth. Any food they eat contains few or none of the substances found in their constituent parts: they must be formed during the process of digestion by many unknown agencies and combinations; and if an analogy be drawn between animal and vegetable life, it may be supposed that the food of plants differs as much as that of animals from the constituent parts, and that the latter are derived from the former by similar processes and combinations. If an animal be restricted to one kind of food, or to two, the growth of the solid parts

of the body and the secretion of the fluids will go on uninterrupted, and the animal will thrive and fatten. The kinds of food contain none of the substances found in the animal organization; and though some of the minor parts may differ something in quantity than if fed on a greater variety of food, yet all the principal parts are unaffected. Charcoal has been found the only fixed ingredient in plants, and that substance has been supplied to the roots without the least apparent advantage. If it could be applied in the form accessible to the roots of plants, it is not known that it would pass through the elaborations and combinations in the plant, and ultimately constitute charcoal in the organization. The case of an animal shows that whatever kind of common food is consumed, the necessary parts are formed; and it may be supposed that plants have similar power of producing the necessary constituent parts from various substances both dissimilar to each other and to the materials that form the composition of the plant. Of elastic matters there may ever be little or no control: they are generated by causes much beyond command or application; and of the solid substances that are applied as manures, it is not known what part, or if any part of them, passes into the plant as nourishment, what agencies they and the soil exert over each other, and what combinations they enter into with the atmosphere, by which they ultimately become so highly conducive to the growth of plants.

The expectation of gaining any knowledge of the matters which form the food of plants, and of a mode of applying those matters to the soil, from an investigation of the constituent parts of the plants themselves, must rest on a very uncertain supposition; for, in any case of similarity or analogy that exists in the natural world, no deduction of that kind can be made, and from observation and experience all the knowledge that is possessed on these subjects has been derived. If the veil were withdrawn with which Nature has enshrouded many of her works beyond the reach of our visual organs, and our eyes were permitted to roam over a field very probably for ever, and very justly, forbidden to man, the probability is that our practice might not be any way improved thereby. On the contrary, the attention might be diverted from principles that never fail, and wander in pursuit of an Utopia, probably never to be obtained by our utmost scientific research, or reduced to practice by any human skill. But on the other hand, it is very possible to use any advantages that may result from such investigations, without departing in any hurtful degree from the solid principles of practice. The combination of science with practice, so far as the former is capable of application, will ever constitute the safe mode of proceeding with every judicious cultivator, ever bearing in mind, and never for a moment forgetting, the influence of physical causes and of external agencies that bear on every such application, on which the whole matter hinges, which are generally overlooked, and over which human agency never can exert any control. From want of a due attention to the different circumstances of application, much misunderstanding and acrimonious disputation

has arisen, which, with a little more knowledge of the subjects on both sides, might have been avoided.

In the preceding observations on the action of manures on soils and on plants are embodied the latest opinions on the subject, the results of the scientific investigations of the most distinguished chemist (Davy) of our age, whose attention was turned to the specific object of applying the aid of chemistry to promote the cultivation of the earth. The results of his labours are stated by him with much philosophic candour and becoming diffidence; and though no improvements in practice have been derived from them, they have nevertheless greatly enlarged our knowledge on these points, and have shown that everything has been done that the best exertions of our scientific knowledge can do, and point out the path of investigation to future inquirers, who may by

some single discovery amply compensate for all former disappointments, accelerate and greatly advance the progress of the art beyond what might have been expected during a great number of years of ordinary advancement, and introduce a new era into its history and application. Such studies, though not attended with evident practical utility, as all human speculations from their nature cannot be so, are highly deserving the attention of rational beings. By laying open the wonders of creation they increase our reverence and admiration of the great Source of being, who supplies every created thing with the proper nourishment and in the most regular order and harmony, by ways and means beyond our finding out. On these subjects it would be presumptuous to be sanguine, and unphilosophical to despair.

PLOUGHING, PLOUGHS, AND PLOUGHMEN.

PLOUGHING.—This is one of the most important acts of husbandry in farm practice. Upon the due and proper execution of this process, this department of business, the prosperity and productiveness of the crop mainly depend. The efficiency of its performance is the true foundation of a good tilth. It is the primary moving of the soil to form the safe and proper seed-bed. It is the first process in common or ordinary cultivation, and when effectually done, saves much harrowing, and other subsequent working. Effective ploughing prepares the soil for thorough pulverization, so that it can be the most readily reduced into an equable and well-broken state to receive the seed. Correct ploughing will expose the greatest surface or amount of soil to the atmospheric influences, or to be wrought upon by harrows, and other working, so as to give friability and looseness in the first stage, and equanimity and consistency to the greatest portion of the soil subsequently, whereby the rootlets may be enabled to penetrate into it, and thus derive food in the greatest plenty. The best ploughing will provide best for the ultimate and partial consolidation of the soil, so as to form a firm, though open soil, for the healthy sustenance of the crop till it arrives at maturity. The true principle involved in the philosophy of good ploughing is the exposition of the largest quantity of soil to promote the disintegration of the ammonia it inherently contains, and that it may take it up more abundantly from the atmosphere by being thus broken up and reduced by subsequent working. If the ploughing is efficiently performed, it will safely bury many surface weeds, or it will cover up and cause to rot any matters or manures required to replenish the soil. The true and correct practice in ploughing, as ascertained by long experience, is to lay the furrow-slices at an angle of forty-five degrees, that is, the furrow must be about one-third more in width than in depth—or as 6 in. to 9, or 7 in. to 10, &c., &c. It is thus that the greatest amount of soil is exposed to weathering influences; besides, in this way it must, if properly done, lie close. No hollows, “no

hog-troughs,” but one uniform series of furrows in the best position for the harrow to work with the greatest effect and usefulness; and thus the most readily to secure the disintegration of ammonia and its subsequent deposit. Good ploughing, then, exposes most surface to the air; it provides best for subsequent harrowing, and also prepares it, when well-broken down, for better and more consistent consolidation, so that no hollows supervene between the surface and furrow sole. These important ends are requisite for the best sustenance of nearly every crop.

PLOUGHS.—I am not about to write an elaborate article upon this part of my subject: my limits will not permit me. I shall, therefore, merely give a few observations about ploughs. I have nothing to say about the old Kentish Turnwrest. It may be a useful implement, as being convertible into many other phases, such as the Skim, the Broadshare, the Scarifier, the Horsehoe, &c., &c.; but, as a plough, I look upon it as shortly to be “a thing of the past.” Its awkward, cumbrous, unwieldy construction can never allow it to hold a place amongst modern farm-implements.

In the same class I put the old Norfolk Gallows Plough; but it is not so convertible as the former. I am often at a fault when viewing it, on my occasional visits into that county—for I verily believe it is not to be found elsewhere. I wonder that the far-famed Norfolk farmers should persist in using such an obsolete implement. I grant readily that it can and does do its work; and so would any plough, in most parts of the county. It is one of those countries which our old and ever-lamented friend Henry Handley used to say might be ploughed “by two rabbits, with a clasp-knife.” The only legitimate conclusion that I can deduce is, that the Norfolk farmers continue to use it in memorial of their great patron and friend, the father of modern agriculture, the late Earl of Leicester, whom they all but adored. I also view it as speedily to be “a thing of the past.”

There are also many ploughs of local manufacture equally reprehensible. There are many swing-ploughs

yet made with short beams, short bodies, and short hales, or handles. A swing-plough requires to work easily on the balance between the hand of the ploughman and the shoulder and back-bands of the horses, or there is hard work somewhere. Now you cannot poise or balance a short, close-made plough with the ease and facility of one of longer make and longer handles. If in too deep, you have to press the harder to get it out; if too shallow, you must use a sudden and abrupt lift to put it deeper. These are giving way to longer and more easily-balanced implements. Nearly all the ploughing in Ireland is ploughed with short ploughs and short, stumpy mould-boards; consequently, the work is roughly laid, greatly broken, and at much cost in extra draught.

I also view ploughs made with wood beams, hales, and occasionally wood bodies, as being nearly as reprehensible. Most of this class have, however, been greatly modernized; and many excellent implements, of good pattern and model, are made, to be found almost everywhere. It is true that, so long as every mortice, every pin, and the wood itself, continues sound and good, the plough will work well and easily; but so soon as any part begins to decay or loosen, then the draught begins to accumulate; and the application of the dynamometer would satisfy the most incredulous that perfection does not lie in a plough partially made of wood.

I have arrived at the same conclusion, and consequently come now to the iron ploughs. These are fast superseding all the other kinds—and most deservedly so. Their manufacture has been closely studied, and perfected with the greatest care and skill. Their stability and durability are beyond all question to be preferred. Their general form and perfection of the various parts are such as cannot be retained in wood, nor cannot it be so uniformly attained—one model sufficing for all of the same class. I know not how to improve the turn-furrow of some of our iron ploughs. Those eminent makers, the Messrs. Ransomes and Sims, and the no less eminent firm of James and Frederick Howard, have the credit of achieving this. Now imitations of their ploughs are everywhere found; indeed, they must keep on the alert, for I incline to think that in some of our recent ploughing meetings they have been excelled; not in general adaptation and usefulness, but in one important point—I mean in lightness of draught. It was but slight, but it was the fact; and I call their attention to it—more especially as I am well aware, if improvement there is to be had, they will move the world to obtain it or achieve it.

I have often tried experiments to test the draught of wheel *versus* swing ploughs, and have satisfied myself upon that point. The new-made strong swing plough, of wood frame, &c., will generally give the lightest draught in good hands, owing chiefly to its being of less weight than of iron; but let it be worn, and put it into the hands of an inferior workman, and the difference is soon found to be very great. The addition of wheels is advantageous, as preventing irregularity in the tillings. The difference, however, is not in proportion to the difference in weight of the wood frame *versus* iron. The

iron ploughs that I have tested give invariably the most equable tillings, and, as compared with a worn wooden plough, considerably lighter, although the plough itself may weigh considerably more; indeed, I have placed myself on the plough body, but my additional weight did not give a draught of two-thirds my actual weight. Of course, I am supposing both the iron and wood ploughs to be as nearly as possible upon the same model: as for some of the short-bodied, ill-formed, mould-boards, the additional draught is astonishing. Those ploughs having a long mould-turner or mould-board, and shaped or inclined so that if a straight-edge is placed on the share at the point, and is drawn along from the point to the utmost length of the mould-board, it shall touch it all the way, will invariably be found to possess the lightest draught; at least this is my experience. And it is clear there is no extra lift or prising or pushing aside in any one part, but all is one even regular effort on the part of the share and mould-turner to pass under, lift gradually up, and as gradually to turn-over the furrow slice. Wherever there is extra friction there must be extra draught. There is generally in the common-made ploughs a fulness either in the breast of the share or in the breast of the mould-turner. This is supposed to give the first prise or lift, so as to cause the furrow slice to separate more directly from the furrow sole, and to be more easily turned. This is wrong, as it mostly has the effect of breaking the furrow, so that no mould-turner could then make it lie correctly, to say nothing of the extra draught.

PLOUGHMEN.—There is something like instinct in a ploughman. I have had men who never could learn to plough, whilst others take to it at once. I never could impress upon some men in what consisted good ploughing; so long as the soil was in some way or other turned over, they were satisfied. Now, if the plough put into their hands would, in spite of the ploughmen, execute its work in a proper manner, a great thing is gained. I am inclined to think that many of our firmly-framed iron ploughs, with wheels set under the master's eye, would enable him to employ many an inferior ploughman; and this is almost the only point I intend to name. The adoption of wheel-ploughs will make the master more independent of his men. Lads can manage them readily. There cannot be a doubt but that a first-class ploughman is a valuable servant upon a farm. His superintendence, his work, and example to others have a very good effect, and stimulate them to greater exertion and care. Good ploughmen are entitled to higher wages; hence if an inferior man with a superior plough can be made to do good work, the farmer is advantaged. I therefore would recommend wheel ploughs, most decidedly, for this purpose. Many ploughmen are unable to set their irons properly, and much indifferent ploughing is the consequence. A good ploughman who understands this part of his business is also a great help to others in guiding them in this particular.

THE NEW METHOD OF PLANTING GRAIN.

In a recent number of this journal, in reviewing the mechanism exhibited at the Royal Society's Show at Salisbury, we described the new dibbling machine invented by "Sigma," the *nom de plume* of a gentleman well known for his inventions in this department of agricultural mechanism; and proposed at some future period to notice at some length the "system" which the machine was designed to aid. This we now proceed to do.

"Sigma" terms his system a new one. It is not so, however: it is simply the old method of "dibbling" or "setting." But inasmuch as the mechanism which he employs gives infinitely greater facilities for performing the operation than any yet introduced, and indeed enables it to be performed on the large scale as expeditiously as it was formerly done on the small, and with much greater precision and economy, he deems himself entitled to give the system the name and dignity of "new." In order to detail the economical and productive advantages of the system, Sigma publishes and distributes to all *really interested* in the matter, with characteristic liberality, a pamphlet, the matter of which we shall take as the basis of our remarks.

The ordinary method of dibbling is thus described in the *Encyclopædia Britannica*: "The lands on which this method is particularly prosperous are—either after a clover stubble, or on which trefoil or grass-seed was sown the spring before last. These grounds, after the usual manuring, are once turned over by the plough in one extended flag or turf; at ten inches wide, along which a man who is called a dibbler, with two setting-irons somewhat bigger than ramrods, but considerably bigger at the lower end, and pointed at the extremity, steps backwards along the turf, and makes the hole about four inches asunder every way, and one inch deep. Into these holes the droppers (women, boys, and girls) drop two grains, which is quite sufficient. By this mode three pecks of seed is sufficient for an acre; and being immediately buried, it is equally removed from vermin and the power of frost. The regularity of its rising gives the best opportunity of keeping clear from weeds, by weeding or hand-hoeing." Although this process is by no means so precise and economical as the system introduced by Sigma, he nevertheless says that his experience of this, the old method of dibbling, with all its defects, shows that "all things being equal, whether the soil be rich or poor, light or heavy, drained or undrained, I have found 'set' wheat succeed better than when drilled or broadcast, merely because each plant has an even space allotted to it. * * I do not mean to say," Sigma continues, "that 'planted or set wheat' does not succeed better on some lands than others; but what I affirm is, that, everything being equal, of two pieces of land of equal size, one 'set' with wheat, the other 'drilled' or 'broadcast,' the 'set' land will produce a heavier and more healthy crop, and with straw

always standing stiff and erect through all weathers." To bear this statement out, Sigma institutes a short inquiry into the *rationale* of ploughing, or rather sowing wheat, by means of the "drill" and by "broadcast." The seed by the method of "drilling" is dropped in a continuous row, leaving no intervallic spaces for the plant to branch or tiller, the result of which is that this branching or tillering can only take place in the spaces between the rows, not between the plants in each row. This tillering, however, does sometimes take place in the rows themselves, but only at intervals where the plant has been destroyed, or where the machine has ceased its action and no seed has been deposited. In these lapsed spaces the plants "tiller," and assume the circular form, which is the natural one; and here, in these spaces, are always found the healthiest and finest plants. Again, in "broadcast" the plants are scattered unevenly over the surface, with no regard either to regularity or uniformity of space, or, what is worse, with no uniformity of depth; so that if one-half of the seed did not fail, that is, did not germinate, "the crop would be so crowded that it would never come to perfection; but luckily half is so deep that it becomes rotten." In ordinary practice we often see the advantages arising from thin seeding, or thin seeding the result of accident. On this point "Sigma" has the following suggestive remarks: "How many instances could I relate of farmers being about to plough up a 'miserable-looking piece of wheat,' so 'thin' that I have heard them say they despaired even of getting back their seed! On the approach of spring, the plants of what had been called 'a wretched piece of wheat' have stocked out, as it is termed; they have had room to grow in the circular form, or as nature intended wheat should grow. This wretched piece, to the surprise of every one, has become the best piece on the farm. But this is so common a case, that I have no doubt most persons can call an instance of this kind to their recollection. What a lesson ought this to teach us, and how few ever take advantage of these facts!" In this case of accidental thin seeding the seed would be very unevenly distributed, many square yards doubtless being altogether devoid of a single plant. Some notion, then, of the results may be gathered by supposing the field to have had the plants evenly dispersed over its surface, say "at the rate of two stools (each stool containing five or six plants) to the square foot." In "Sigma's" system, the principle is to deposit the seed at a uniform depth, allotting to every plant, or stool of three or four plants, an equal share of room, "so that it shall from its infancy be well fed, produce stout and healthy stems, and remain stiff and erect in all weathers." It is immaterial whether "one plant or five form a stool, provided the five grow up out of a small hole as a single stem, and form apparently one plant." All that is essential is that the wheat plants shall have room to assume the circular or

natural form, and not be interfered with by the too near approach of neighbouring plants. "Sigma's" plan is to plant from ten to twelve grains of wheat in each square foot of ground, inserting each grain at a depth suitable for its germination, so that the growth of every seed is secured.

With reference to details of practice, "Sigma" has some useful remarks. Of these we now present a *résumé*. The system should be carried out early in the season, the greatest success being ensured by doing this—say from the latter end of August to the first week in October. At this season three grains in each hole will be sufficient, the rows being nine inches apart, the intervals in the rows eight to twelve inches. The depth varies according to the soil; in light land one-and-a-half, and in heavy not deeper than one inch. The "plants will nearly touch in the course of two months, crossing in the ground, and are not liable to become 'winter bound,' for every stem is stout, stiff, and hard, and grows horizontally." As the season advances more seeds should be put into the holes; after the 1st of October five or six seeds to each hole—five or six to the half foot amounts exactly, in average sample, to five gallons per acre. "There is nothing to be compared with machine-planted seed," says "Sigma," "for regularity. If you seed early, and place the plants in stools (four, five, or six plants to each stool growing up out of a small hole as a single plant), at nine inches apart every way, you will find that before winter the plants or stools will become so bushy and circular that the intermediate soil will hardly appear. The plants will be three times the size of those 'thickly seeded,' having room to extend their shoots every way; the roots, likewise, having a longer time for growth, will be found, if examined, to have extended a great depth after their food, particularly if the soil be poor and well drained. Here it is not an unusual thing to be able to trace them five feet below the surface. The roots that extend sideways also, on poor land, seek their food at great distances, searching for inorganics, to stiffen the straw and stay the plants in wind and rain. To a crop of this description, where the land is so poor that the plant has to search far and wide through the soil for food, a little guano in spring has a most marked effect. This is my plan of growing wheat; my plants become giants, not pigmies, and bear a crop in proportion."

Dibbling on the ordinary system cannot be carried out on light lands in a very dry season, as the holes fill up as fast as the dibber is withdrawn. On the contrary, in a very wet season, on strong and stiff clays, the seeds in the holes cannot be properly covered up by the bushes which are drawn over them. By the use of Sigma's "corn planter," both these evils of the old system are completely obviated—in the first, namely on light lands in dry weather, because the making of the holes and the deposition of the seed are thus dependent on each other. To the under side of the angular seed-box, a row of from four to eight brass nozzles or tubes

are fixed, in the inside of which the steel dibbers work up and down by means of the handle. The instrument being jerked on to the ground, the nozzles penetrate into the soil as far as the bottom of the box to which they are fixed. The steel dibbers are then withdrawn, the action of withdrawal of which permits the seed to fall from the seed-box into the holes made by the nozzles; when the dibbers are made to descend, pushing the allotted portion of seed into its own hole. The seed being thus deposited before the nozzles which make the hole are withdrawn, the objection of the old system is completely obviated. Nor is this operation of the instrument an old one, as at first sight it might appear to be; thirty-four of the necessary movements can be made on the average in a minute, giving with a five-row machine 170 holes filled, and all executed in the most perfect manner. In wet weather, on strong stiff clay, the holes or water-cups, which cannot be well closed on the old system, do not exist when Sigma's instrument is adopted, inasmuch as the diameter of the holes is exceedingly small. On wet land the seed should never be deposited more than an inch below the surface.

Not the least recommendation of the instrument is that with it the work done cannot be "scamped:" even with the most indifferent attention given to its working, the seeds cannot fail to be deposited, and with the greatest uniformity of depth. The amount of work done by a strong lad or man per day is equal to one acre, and this amount is more easily performed than half the extent on the old system. The depositors, or "corn planters," are made to deposit the grain in rows of the usual width apart, namely, 9 inches; and if the intervals between the rows be also 9 inches, the stools all then stand in squares, which admit of every facility for hoeing. In using a machine with five depositors to make ten rows of corn on a 7 feet stretch, the depositor is in the first place brought close to the furrow; the operator then works backwards, depositing the seed in the rows at intervals of 8 or 9 inches, till the end of the field is reached, when the operation is reversed to the other end of the field.

To induce some of our readers to give the system a fair trial, we in conclusion, show (in the words of Sigma) the satisfaction that awaits them by so doing: "Few until they have tried it can form any idea what a crop of dibbled wheat is like, the seed being inserted at even distances, and at a proper depth; it totally differs from every other method, the vigour of the plants—not the over-luxuriance producing mildew, all flags and no corn—the efforts made by nature to fill up every space, and, when further advanced, the stiffness of the straw, resembling sticks, the length and weight of the ears, are interesting and instructive to observe."

To those desirous of knowing more of the contents of the pamphlet which "Sigma" has published, than the space at our disposal has permitted us to give, we may mention that it is obtainable at Mr. Kidgway's, the publisher, Piccadilly.

R. S. B.

THE AGRICULTURE OF INDIA.

In assuming the more immediate control of the vast stretch of country now known as "British India," and extending almost in one uninterrupted line from Pegu in the East to Kurrahee in the West, we have undertaken great responsibilities, civil and political. If there have been great short-comings heretofore in our government and management of the natives and of the country over which we have exercised rule for so long a period, there is the more reason now why our best energies should be put forth to improve the condition of the people, and to develop the indigenous resources of the vast territories extending through every climate, for which England has paid so dear. It is not our province to enlarge upon the political aspect of the question; but we can at least direct attention to the openings for British enterprise and the call for agricultural improvement. The bar of exclusion, which formerly shut out from India every European but the covenanted servants of the East India Company, is now removed, and Englishmen will be no longer restricted to the cultivation of indigo and sugar, but may now, with the improved tenure of land and the extended field of operations open to them, turn their attention to whatever seems best calculated to be remunerative and successful. A strong movement is making to people the hillsides and healthy localities of India with Europeans, and the extension of railways will enable operations to be carried on in the plains. In the Himalaya mountains, whose sides seem carved by Nature to an angle forbidding the exertion of the farmer's art, patient perseverance has triumphed over the difficulty, and the natives raise crops upon the acclivities, which enable them to subsist high up among the precipitous formations.

But it is by the introduction of English capital, English improvements and supervision, and the modern scientific practices, that the largest amount of benefit will accrue to India, and which must necessarily react on the mother-country.

Already we are largely indebted to India for rice, for fibres, for oil seeds, for cotton, for wool, and various other staple products raised in considerable quantities. But its indigenous resources are immense, and by the petty and ill-directed exertions of the natives have never been properly developed. If we have received, however, for many years these important supplies, and have also drawn from thence many new products for our fields, forests, and gardens, we may at least give something in return by our skill and energy in introducing new plants and improving the old-fashioned systems in operation. We have introduced from India many valuable coniferous trees, of which we might enumerate a dozen or two, including the Deodar, the *Pinus excelsa*, &c. Several of our cereals also have been drawn from the East, including the Bengal barley and the Nepal barley; the latter in 1817, from the

Himalaya mountains, where it grew near the line of perpetual snow.

Improved internal communication, a better land tenure, public works for irrigation, and moderate taxation will greatly benefit our Indian territories. The result of railway traffic among the natives has already far surpassed the expectations formed, and the third-class carriages are freely used by the Indians on all the existing lines; and these will do much to improve agriculture in the interior. Fruit and vegetables are even now cultivated as far as Burdwan, or 100 to 150 miles, for the Calcutta market. And cattle, sheep, fodder, root crops, &c., will all ere long be brought into the Presidency towns from the hills and interior districts.

One great obstacle to the employment of manures in the East is the prejudice entertained by the natives against meddling with ordure or excrementitious matters; and yet they sedulously collect and dry the cow-dung for fuel, and shape it into toys. The manure has to be applied by baskets—a tedious and expensive process, which a few carts would obviate. In India, the season of vegetation continuing throughout the year, the land might be occupied with an uninterrupted succession of crops.

No branch of Indian agriculture deserves more attention, or has obtained less, than that which embraces the cultivation of the grasses. Whether it will receive greater attention, now that British colonization may be expected to spread over the temperate parts of India, remains to be seen. So innutritious are the ordinary grasses of Hindostan, that hay has to be brought from other provinces; and the roots of the finer grasses are collected for saddle horses. Stock are, for the most part, fattened upon dry food, and grain twice a-day. The most common and useful grass in India is the doob grass, the creeping dog's tooth (*Cynodon dactylon* of Sinclair), which furnishes three-fourths of the food for the horses and cows. The country is by no means destitute of natural grasses, though it cannot compare in the abundance of this produce with milder climes; for Dr. Roxbrough enumerated nearly 250 species as indigenous to the country, some of which, if the seeds were collected and sown on any moderately friable and fertile soil, would make a good pasture. Lucerne (*Trifolium incarnatum*), clover, rye-grass, and spring tares, would all probably succeed in India. The seeds of many of the superior grasses might also be obtained from the Cape of Good Hope, and others with but little trouble from England. There is no doubt some of our very best pasture grasses could be successfully introduced in India, if part of their cultivation comprised a judicious system of irrigation. A better supply of green fodder would not only prevent the occurrence of the sweeping mortality which so frequently visits the cattle during the hot season, but

would keep even the well-fed in health. The maintenance of the horses of our cavalry, and a larger supply of mutton and beef, which will be required to keep pace with European settlement, render this subject of importance.

In Afghanistan several of the millets (species of *Panicum* and *Holcus*) are often cultivated for their herbage, which is dried and stored for the winter. Even wheat and barley are cut green before the ear has formed, and given to horses and cattle with advantage. This cutting is often repeated with barley; but if wheat is cut more than once the crop is injured.

The practical suggestions of experienced agriculturists may do much to improve the systems of husbandry pursued in India. The introduction of suitable implements—not, perhaps, the heavy and expensive ones used in England, where high farming is followed, but still something more effective than the rude sticks used for ploughs, harrows, rollers, drills, &c., for so long a time in India. A better rotation of crops and a better system of applying manure are essential, while the reprehensible practice of growing crops commingled should be abolished.

It is not uncommon to see the cotton plant, pulse, and the castor-oil shrub growing intermixed. In other districts, barley, peas, some one of the oil-seed crops, and safflower are often mixed with wheat. The usual mixtures in Bengal are—flax grown for the seed, and mustard; a kind of pea, lentil, and mustard; and barley or wheat with flax.

The breeds of cattle and sheep can also be greatly improved. The fine, powerful oxen employed by the Indian Government are a proof that proper food and treatment, and attention in breeding, will enable much more efficient animals to be kept for draught than the dwarfish little bullocks commonly used by the natives. Much has already been done to improve the fleece of Indian wool; but more can yet be done. We imported last year about nineteen-and-a-half million pounds of wool from British India, being an increase of more than sixty per cent. in the last four years.

With so many millions of acres available for the culture of plants, either suited to tropical or temperate regions, with cheap labour and with cheap land, there is no reason why an opening should not offer for many a spirited individual in some of the Indian Presidencies.

THE IMPROVEMENT OF THE SOCIAL CONDITION OF THE AGRICULTURAL LABOURER.

Chaucer says of his Clerk of Oxenford, that he was full of

“High sentence;
Sounding in moral virtue was his speech,
And gladly would he learn and gladly teach.”

Now we would remark, in continuation of our notes in our last paper, on the necessity of the *employed* doing his best to exert a good influence in his home and around his hearth, that in this readiness to learn lies his surest hope of being able to teach. This mutuality between giving and receiving, is not so obvious to many amongst us, after all; else why do we show a greater desire to teach than to be taught? The philosopher of old, on being asked how it was that he knew so much, replied that it was owing to his never being ashamed, in asking anything, to show his ignorance of it. Now, the best-informed amongst us must needs admit, if we are honest with ourselves, that we might have been *better* informed had we not too often been ashamed of our ignorance. By pretending that we knew, or at least giving no intimation that we did not know of it, we have lost many a golden opportunity of acquiring knowledge. Now the *employed* must, if he has a real desire to *teach* (and we have in our last paper attempted to show to him his high responsibilities in this matter) he must never be ashamed to be taught, or, by withholding the avowal of his ignorance of any subject, lose the opportunity of acquiring knowledge of it. Nor is this teaching to be derived from books merely, or by himself occupying the benches of a school. Many sage counsels may be dropped, and much sound information thrown broadcast by his employer, or even by the companion of his

labour, in the field while at work, or at the cottage-door while at rest or recreation. For all these things he should have a ready ear and a willing mind. He must cultivate the capability of receiving, as well as of storing up; of looking out for the good seed, as well as preparing his mind for the reception of it; borrowing a lesson from the labour at which he toils in the field—that the land, if left to itself, without the seed-corn being planted in it, brings forth only the prickly briar or the noxious weed; and that *if* sown, the seed cannot fructify to its fullest perfection till the land is cultivated and prepared for it: these two must always go hand in hand, preparation and reception. And, as much knowledge lies hid in books, let him wisely use such spare time as he has given him, in the cultivation of an acquaintance with their contents; nor grudge moreover a little self-denial: much will not, in these days of cheap literature, be required of him, a pipe or a pot of beer the less—to obtain them. But limited as his literature may be, there is always one book to which he can have access, which, whilst it inculcates “fergency of spirit,” no less forcibly enjoins “diligence in business”; and which, whilst it shows us how best to do our duty to ourselves, teaches how fullest to do it to our neighbour. Nor let the employed think that the result of all this self-reform and self-culture will only be advantageous as showing to others the influence of a good home example; although, if it did no more than this, it would be worth all the labour incurred in getting it. It will not end there; as it “grows with his growth, and strengthens with his strength,” it will exert an influence on his own material prospects, and, while it makes him

a wiser, it will also make him a better man—better in spirit, better in body, better in purse and in pocket. In truth, his self-culture—and self-dependence, its most valued fruit—are just the touchstones which change poverty to wealth, and enable a man to rise in the world. It would be easy to cite examples to prove this; but we deem it needless. The maxims of prudence—the current coin of those who have fought the battle of life and won it—and the results of experience, alike abound in truths which point to the worth and value, in a worldly if in no higher and holier sense, of self-culture, self-dependence, and self-denial, all three linked together in a bond of high utility and practical power. Nor let the employed be influenced by the belief that the employer does not wish his rise in the social scale. Many miserable minions of wealth there may be, who do not wish it; but, with more, the feeling exists that it will be a grand day for Old England when the employed shall raise themselves, or be raised, from the degradation of their vices to the dignity of their labour; when the ranks of the middle shall be recruited from the ranks of the labouring classes; and these fired with a new zeal, and animated with a new motive—a desire bright and ever brightening, because ever aspiring—to be as true and loyal to themselves and their destiny as they are useful to the community. We believe this; and he who would urge the labourer to believe the contrary, be he pot-house or platform orator, is in this thing the Devil's emissary, and lending himself to the Devil's "lie." This is plain speaking; but, in this matter, at least, the worth of the thing lies too near the heart of society to be passed lightly over, and not dealt plainly with. We are no advocates for using fine names to designate foul things; to cut and carve at them, round and shape them off, till we get rid of their angularities and protuberances, beautify their ugliness, and gloss them over and burnish them up, till they lose all outward semblance to their real selves; till vice almost comes to have a look of virtue, and lies and deceit the semblance of truth and sincerity. There is much good, believe us, reader, in calling things by their right names—a lie, a lie; and work, work: not the one truth, and the other play. The lack of this avowal of our belief in the real nature of things lies pretty closely at the root of much of our social evil—our sham-worship and our "opaque flunkeyisms," as Carlyle has it—and pretty closely, good reader, at the root of that social evil, the low moral and physical condition of the labouring classes, which forms the subject of our present papers.

Cultivating, then, the habits of self-denial and self-dependence, but ever with a trust in Providence and in His guiding wisdom—showing in his daily transactions with his employer, as well as in those with his neighbours, a high integrity, sound prudence, trustfulness, and charity to all and with all—the labourer will best be able to act a living example to all around him, and, ever learning, will best be able to be ever teaching, and thus his labour of toil will become a labour of love, as he sees his influence spreading around him for good, elevating his neighbours, and bringing fast to a wide-spread realization the wish of the poor man's poet, that—

"A virtuous populacc may rise the while,
And stand a wall of fire around
Their much-loved isle."

This great work of the education of the home, preceded by, as obviously it must be, necessary self-reform and self-education, we have hitherto considered as being carried on by the males amongst the employed, and these chiefly married men, who have families over whom they have to exert an influence, and homes which they have to adorn and purify. But they will require help-meets in this work—nay, from the very circumstances attendant upon their daily toil, they will be so much absent from their homes as to be obliged necessarily to delegate their power to another; and this other, who so fitting as the wife and mother to wield? The husband must be the head—the bond, or band, of the home; for such is the primary signification of the term "husband," which knits all the family together in the oneness of a common interest, and in the strength of love. But the wife must give the most frequent teachings, because she possesses the most frequent opportunities. Indeed, the truth is, that the education of the home is mainly dependent upon the mother. Fenelon says that "the education of women is more important than that of men, since the improvement of man is always their work." And another writer states that "the health and purity of the social system are placed under the immediate guardianship of woman." And we all know how the majority of great and good men have been indebted to the training of their mother. Seeing, then, the importance of her duties and the extent of her influence, it behoves the wife and mother to do all in her power to prepare herself for the exercise of this influence, and the performance of these duties. And to her will apply much, though in a sense more or less modified, of what we have already said as to the importance of self-culture and self-denial to the man. And it will only be when both together are actuated by the same right feelings, and live according to the same right principles, that they will be help-meets in truth to each other; the trust of the wife in the husband being met with confidence in the wife by the husband; the strength of counsel of the one by the loving obedience of the other; and all begetting alike obedience and love in the children; till, for the responsibilities of the family, they shall taste of its delights, and be gratified by its pleasures, and for the wise teachings of the hearth they shall partake of the pure sanctities of home.

The benefits derived from the "education of example," and the "education of the home." These naturally lead us to the "education of the school," in what direction this should lead, and in what manner it should be carried out. So much has been written on the subject in this and other journals, and with which our readers are doubtless familiar, that we are spared the necessity of going very deeply into its details. Whatever school education should consist of, it should *not* consist merely of the education of the intellect, to the exclusion of the education of the heart and feelings. So much stress has unfortunately been laid on "accomplishments," falsely so called, that in getting up the polish we have obtained it at the expense of the pith of

the man or woman. Our present system of educating, although it undoubtedly tends to the repression of crime—crime of the individual against the community—does not tend with equal force to the repression of vice—crime of the individual against himself. The highest cultivation of the head is compatible—and is, alas! too often found so—with the most hardened condition of the heart, and the most depraved and degrading vices of the body. If education, then, is to do good service to the community, we believe that it must not stop content with informing the mind with what is called “useful knowledge,” but it must “strengthen by exercise the powers of thought, quicken the love of truth, awaken a taste for beauty, cultivate the moral sense, and train in moral habits, and stop not short of imparting both a knowledge of the scriptures, and a disposition to believe and practise whatsoever they inculcate.” And here, as the most powerful end to the education of the school, comes in the education of the hearth and home. A writer, who has done much in elucidating the essentials of a good working man’s education, has some pregnant remarks on this point. He says that “virtues are habits, not belief,” and must be inculcated by example rather than by teaching, by training rather than by lecturing. A point of knowledge may be imparted by the persistent force of application, by repeated illustration, by line upon line, by precept upon precept “until at last the mind of the learner yields to their force, and becomes thoroughly saturated and penetrated by the principles in question.” Not so with the inculcation of moral habits and feelings. Proofs in favour of any one of these may be brought from the parables and precepts of every page, almost, of the New Testament, and examples of their power in life may be cited without end. Yet, while the intellect of the pupil yields a ready consent to those proofs, and acknowledges the truth of the examples, it is found to be a different thing to get them to apply them practically to themselves, and adopt them in their every-day life. The lessons of the school then, must be supplemented by the precepts and examples of the home, and the labours of the teacher aided by the authority of the parents. But it must not be overlooked that the education of the home must, if true progress is desired, be aided by the education of the school; that is, the kind of education there imparted must be of that practical stamp which will enable the parents themselves to make their homes happy and comfortable; that to the lessons of piety which they give to their children, they may add those of prudence and of integrity, those of industry and economy. And first in importance are the claims of the female to this kind of practical every-day useful education. We have adverted to the great influence which woman possesses over the welfare of man; and this influence is best exerted under the shelter of the family roof-tree, and around the family fire-side. But under the roof-tree must reign order and regularity, and around the hearth must be gathered the comforts which yield relief to toil, and those pleasures which lighten the labour of life. How best to secure to the female, whose future destiny is to be the wife and mother of the labourer, that edu-

cation which will be of true service to her in her every-day cottage life, is now engaging the attention of those educationists who see the importance of increasing home influence amongst the employed. It is little things which make up the sum of household happiness; and the converse holds equally true, that it is little things which make up the sum of domestic discord. How important then that the future wife, with all her cares and responsibilities, should be taught those little things which will lighten her cares and relieve her responsibilities! To this end it seems reasonable to suppose that that education will be most beneficial which, with the education of the intellect and the heart, combines instruction in common things; which teaches how best to make home comfortable, and to economise means and time; changing that which with improvidence would be the poverty of means, into that which with economy will be the provision of plenty; that education, in short, which will combine working with learning—that kind of working which will enable its possessor to change the habits of carelessness into those of comfort, the home of thriftlessness into that of thriving. Amidst the abundance of institutions calculated to elevate and qualify for the duties of life young women belonging to the upper and middle classes, there are none for those belonging to the lower ranks. The former can attend establishments, and be taught cooking and those branches of female education which enable them to throw a charm over the domestic circle; but the poor man’s daughter is entirely dependent upon her mother, and cannot therefore be expected to know anything beyond what her parent can teach. How little the amount of teaching of this sort which the mothers of the poor can give to their daughters is, let those say who know most of their domestic arrangements and of their every-day mode of life. To aid in this kind of teaching, it is proposed—and no proposition made in recent times bids fair to be so productive of good effects in elevating the social condition of the agricultural labourer than this—to add to the ordinary branches of knowledge imparted in the school-room a practical acquaintance with the duties of a well-regulated household; to give to each female a “knowledge of those common things with which she shall have to deal the whole residue of her life;” that she may be able to “light a fire, to sweep a room, to wash crockery and glass without breaking half of them, or clothes, to bake bread, to dress a dinner, to choose meat or fish or vegetables, and to know where to keep them when bought”; to know, in fact, the value of little, and appreciate the worth of common things; to know, and act moreover on the knowledge—letting it be a living faith rather than a mere dead belief—that the difference between money saved and money lost at the week’s end, is just the difference between the right and the wrong method of doing such humble things as peeling and boiling potatoes, kindling a fire and poking it when kindled, mending a worn garment and washing a soiled one, and numberless other things more humble still than these, and apparently more trifling. We say *apparently* more trifling, for this is just one of the lessons that the expectant wife

must learn—that nothing that is worth doing at all is or can be trifling; as sand makes the mountain, drops from the cloud or dews from the grass the rivers, so do little things make up the grand total of the duties and the privileges of domestic life, and that the doing of them rightly is just that which makes the homes of happiness, as the doing of them wrongly—or what is worse, not at all—the dens of discord. Further, the expectant wife must strive to arrive at an appreciation of the dignity of economy, and become convinced that there is more meanness in the waste which brings want, than the saving which brings security against it. It is not mean to be economical, or stingy to be saving, as is too often said by the poor while stigmatising the habits in these directions of the middle classes and the rich. We must get before we can give; to be charitable to others we must be careful ourselves. The poverty which comes about by want of providence deserves no pity, and the sorrow which arises from self-indulgence no sympathy. “Much food,” says the wise man, “is in the tillage of the poor; but there is that is destroyed for want of judgment.”

But in the cultivation of the utilities we must not—recollecting the fine distribution, in the material and moral world, of labour and rest, of food for the body and things pleasant for the eye, of the time to rejoice as well as the time to weep—neglect the cultivation of the beautiful. If the home of taste is not always the home of happiness, it goes far as a help in the cultivation of fine tempers and feelings, and adds to the amenities and pleasantnesses of social life. This aspiration after the beautiful in nature and in art, which all of us have, more or less defined, is implanted in us for high and holy purposes. We see this exemplified, in every scene around us. We have the corn and the coals for the sustenance and comfort of the body; but the flowers and their perfumes no less, to please the eye and cheer the spirits: we have the grass for pasture for our flocks and our herds, but it is radiant with flowers and redolent of sweet-smelling perfumes: the trees, that yield us timber for our ships, add beauty to the landscape; and the same breeze that wafts them on their errands of peace brings to us the breath of health and fans the fevered cheek: the sea, their mighty pathway, soothes us in its calmness with the melody of its murmurs, or raises in us emotions of the sublime with the thunder of its rushing waves. All around us gives evidence of this unison of the useful with the beautiful or the grand in the economy of nature, and affords us lessons how best we may carry out a like unison in the economy of our domestic and social institutions. Mr. Ruskin, who has done so much—of which the world will some day better appreciate its high value than it appears to do now—in the advocacy of the beautiful and the true—beauty in truth, and truth in beauty—has some fine and most suggestive remarks on this point. In explaining that we have warped the word “economy” in common language into a meaning which it should not bear, he points out that it means “the right management of labour”—labour rationally *applied*, and its produce carefully *preserved* and seasonably *distrib-*

uted—and quotes as the Wise Man’s description of the queenly housewife or the virtuous matron the following: “She riseth while it is yet night, and giveth meat to her household and a portion to her maidens. She maketh herself coverings of tapestry; her clothing is silk and purple. Strength and honour are her clothing, and she shall rejoice in time to come;” enlarging on this as a text, in language beautiful exceedingly, thus: “Now you will observe that in this description of the perfect economist, or mistress of a household, there is a studied expression of the balanced division of her care between the two great objects of utility and splendour—in her right hand food and flax, for life and clothing; in her left hand the purple and the needlework, for honour and for beauty. All perfect housewifery or natural economy is known by those two divisions, wherever either is wanting, the economy is imperfect. * * * * In private and household economy you may judge always of its perfectness by its fair balance between the use and the pleasure of its possession. You will see the wise cottager’s garden trimly divided between its well-set vegetables and its fragrant flowers; you will see the good housewife taking pride in her pretty tablecloth and her glittering shelves, no less than in her well-dressed dish and her full store-room; the care in her countenance will alternate with gaiety; and though you will reverence her in her seriousness, you will know her best by her smile.” This is beautiful writing, and no less true than beautiful; and conveys much that is, or ought to be, valuable to us in every-day conduct.

To enable the poor man’s house to have its well-balanced divisions of true economy, we see that it is necessary that its owners shall be well taught the utilities and the beauties of life, and have wherewithal (or the education will be but a mockery after all) to put them in practice—homes consistent at once with the cultivation of the delights as well as the decencies of life. Of what class or kind the lessons of utilities should consist we have already in our last article shown. Much of the education of the beautiful is comprised in ordinary scholastic education, where the taste is cultivated and the mind refined by intellectual training. Nor while advocating the necessity of a cultivation of the heart, as well as imparting a knowledge of “common things,” do educationists who see the advantages of this direction in education, ignore or think lightly of the value of *intellectual* training. On the contrary, they wish to see it carried out to its fullest capabilities, only insisting that this shall not be done to the exclusion of those other points which they conceive essential elements in the education of the labouring classes. They are not ignorant of the immense influence for good which an intellectual training exercises on the minds of the employed, in bringing them up to a level with those of the employers; for it is to be noted, as remarked by a keen observer, that in cases where there is a real sympathy of the heart influencing us in our intercourse with those beneath us in the social scale, there is often an impassable barrier “presented by a lack of sympathy of intellect.” And it is in this way that the utility of an intellectual education will act so powerfully in increasing

the bond of sympathy which in our first paper we dwelt upon. By both occupying the same platform, and by being able to traverse the same domains of thought, we shall best be able to understand each other—our thoughts, feelings, and motives—and “we shall all be drawn nearer to each other, by means which at the same time help to draw us nearer to the fountain of light and knowledge, of truth, and holiness, and love.”

And here we would for a moment pause, to point out one powerful means of *urging* the employed to avail themselves of such education as now in nearly every village and hamlet is happily placed within their reach; for it is a painful truth that they are amazingly indifferent to the advantage which a liberal education bestows upon them. This, however, is to be attributed to ignorance. Before we can persuade a man to take hold of the rope which we throw to him while plunged in the water, we must first make him believe that he is really in danger, and secondly that the rope is strong enough to pull him out. Now, in like manner as regards education, our first duty is to explain to the employed that he is plunged in a state of ignorance which is dangerous to his future success in life—that it is in fact a state of death he is in; and next, that education will not only raise him out of this condition, but in the surer footing it will give him when out of it, he will be able to advance to higher life and a more influential position. And to add urgency to this latter reasoning—perhaps, with most of them, as it would likely be with most of us, the most forcible argument—let the employers determine to give the *best* employment they have to the *best educated*; let the employed see that their power in gaining high remuneration will just be in proportion to the extent of their attainments; that education is, in fact, a necessary thing to be possessed of, as much so as a chest of tools, or a capability of doing the work of the trade they profess to follow. And if this plan is persistently followed out by employers, not long will it be ere the employed will perceive the advantages of education, and suffer no small amount of self-denial to come between them and its attainment.

We have already urged upon the employed the necessity of his ever learning; but this implies that he must be always in some way or other ever taught. Education to be beneficial must be permanent; and it is remarkable how rapidly the lessons of the school, however well grounded at the time, fade from the memory, if not perpetually renewed by re-study and continued dressing as it were. Man's mind in this respect is like the field, which, if allowed to remain too long unstirred, becomes overgrown with weeds, that completely overshadow the fruitful plants. To aid them in this after-cultivation and cleaning of the soil in which the seed has been sown, means must be thrown in the way of the employed of filling up his spare time by listening to oral instruction in the way of lectures on subjects calculated to be useful, as well as in providing him with the means of study by books in the reading room, or by means of itinerating libraries.

“Tell me how a man employs his leisure hours, and I will tell you what he is.” Tested by this standard,

how fearful must be the short-comings of our employed! If their leisure hours were simply wasted with following out

“All the tricks
That idleness has ever yet contrived
To fill the void of an unfurnished brain.”

the moral evil done would be bad enough; but where, to the addition of the waste of time incurred by the follies of the working man's leisure hour, we find a continuity of vicious indulgence and determined depravity, the evil which they suffer, and through them society, becomes in its effects so appalling, that it well behoves us to pay strict attention to the means by which they can be obviated. The nature of the leisure-hour employment is, to be sure, not to be wondered at, seeing that while we do everything to encourage the attractions of the beer-shop, by doing nothing to counteract them, we are hugely indifferent to all attempts to make the houses of the employed calculated, by the comforts which they possess and the attractions they offer, to win him to stay at his own fireside; and farther, while we do offer him any amusement, it is of the questionable character of the race-course, the low theatre, or the harvest-home and rural fair, with their too-often-found-concomitants of open vice and public profligacy.

But with the attraction of a well-arranged, healthy, and comfortable home, with its plot of ground, however tiny, in which the labour of love will raise vegetables for food and flowers for fragrance and delight—we have no fear but that, with these attractions, the employed will find amusements for himself and for his family. To this end, however, we must sooner or later become convinced of the necessity of providing the employed with time—time for education, and time for recreation. There “is a time to labour” and “a time to rest;” and miserable is the condition of the workman, and unsound the condition of society, in which the time for rest is swallowed up in that of labour. If it is true that, if “man will not labour, neither should he eat;” it should be no less true that, *if* he labours, he *shall* eat—not always true, good reader, in this boasted nineteenth-century time of ours. The laws of Providence, if we honestly work them out, and aid their application to the purposes of every-day life, are so beautifully adjusted to our social necessities, that, where labour is rightly managed, it always affords not only the necessities of life, but the delights of leisure and the health of rest. But if we go contrary to those laws, and mismanage our labour, then as a result we find poverty and the woes of want around us. “Wherever you see want, or misery, or degradation, in this world about you, there be sure either industry has been wanting, or industry has been in error. It is not accident, it is not Heaven-commanded calamity, it is not the original and inevitable evil of man's nature, which fill your streets with lamentations and your graves with prey. It is only that where there should have been prudence, there has been waste; where there should have been labour, there has been lasciviousness; and wilfulness where there should have been subordination.”

Labour thus placed on its right basis, and worked out in conjunction with the laws of mercy and justice,

no less than of truth and right, brings with it alike exemption from want, the luxury of leisure, and the recreation of rest.

But in this adjustment of the relation of employers and employed, which is necessitated, so that for a *fair* day's work the employer shall give a *fair* day's wages—not the poorest of fare for the hardest of labour, the least of leisure for the most of time—there should exist that mutuality of interest which we have all along insisted upon as necessary to be maintained between the employer and the employed. We have shown that of the three things which constitute economy the wise management of labour, the careful preservation of its produce is one. An increased liberality on the part of the employer, must be met with the increased care of the employed. We must learn to prevent want by the avoidance of waste; to ward off to-morrow's poverty by to-day's prudence, and to secure fortune by forethought.

Our much exceeded space warns us to conclude; but in what we have found space to say, the reader will perceive that our main object has been to show that much of the improvement of the social condition of the employed rests with himself; that self-reform and self-dependence will bring about many other reforms, which he is now wearily, and without them may we say hopelessly, waiting for. Nor less plainly have we attempted to show what the employer is expected to do, and we believe must do, before that elevation of the condition of the labourer, in which he is as much interested as the workman himself, can be carried out and fairly and fully inaugurated.

By adding to the attractions—attractions of taste as well as of comfort—and inculcating an appreciation of the sanctities of home; by educating the heart as well as the head, elevating the aspirations and refining the minds of the employed; by drawing closer the bond of sympathy between him and his employer, so as to realize much of the power—though working out in another way perhaps, the principles—of the patriarchal government: by doing all this, and thinking each of us of doing what we can, rather than waiting for others, criticising their conduct and scanning their motives, looking within as well as without, we may do much, if we do not do all, to get rid of the social evils which oppress the labour of agriculture. The reforms, or rather reform which we have pointed out, will go far to lessen the evil, if not do away with the necessity, for the systems of the “bothy,” the “bondager,” and of “field gang-work.” “Execute true judgment, and show mercy and compassion every man to his brother; and let none of you imagine evil against his brother in your heart.” This principle of true judgment and of charity, binding alike on the labourer and the master, followed out in every-day life and every-day duties, will tend to make the life useful and happy, and the duties well performed.

But much as the employed can do, and should do, in conjunction with the efforts of the employer, to elevate his own condition, there is much which the employer must of necessity do alone. Wealth, as Ruskin

terms it, is “the helm and guide of labour far and near.” Those who have it are “in reality the pilots of the power and effort of the State;” it is entrusted to them as “an authority, to be used for good or evil, just as completely as kingly authority was ever given to a prince, or military command to a captain.” Those who have it, he says, may stretch out their sceptre over the heads of their labourers, and as they “stoop to its waving,” he may command them to water the dry, and plough the desert places, or on the other hand to build a mound for him to be throned on, high and wide; to make crowns for his head, and tapestry on which he may place his feet; to dance before him, that he may be gay, and sing sweetly to him that he may slumber, that he may “so live in joy, and die in honour.” “Better far,” he says, “than such an honourable death, it were, that the day had perished wherein he was born, and the night in which it was said, There is a child conceived. I trust,” he continues in one of his glowing sentences full of thoughts that breathe and words that burn, “that in a little while there will be few of our rich men, who through carelessness or covetousness thus forfeit the glorious office which is intended for their hands. I said just now, that wealth ill-used was as the net of the spider, entangling and destroying; but wealth well used, is as the net of the sacred fisher, who gathers souls of men out of the deep. A time will come—I do not think even now it is far from us—when this golden net of the world's wealth will be spread abroad as the flaming meshes of the morning cloud are over the sky, bearing with them the joy of light and the dew of the morning, as well as the summons to honourable and peaceful toil. What less can we hope from your wealth than this, rich men of England, when once you feel fully how, by the strength of your possessions—not, observe, by the exhaustion, but the administration of them, and the power—you can direct the acts, command the energies, inform the ignorance, prolong the existence of the whole human race; and how, even of worldly wisdom, which man employs faithfully, it is true, not only that ‘her ways are ways of pleasantness, but that her paths are peace;’ and that for all the children of men, as well as for those to whom she is given, length of days are in her right-hand, as in her left-hand riches and honour.”

In the remarks which we have been thus privileged to lay before our readers, want of space has compelled us to omit the discussion of points which we have not even adverted to, but which at some future time we may find an opportunity of doing. At the opening of our present series of papers we claimed no higher position for them than as a medium for glancing at the subject merely, reserving a full review of its entirety for another period. We shall be glad if our sketches will induce some of our readers to fill up the details, and induce them to endeavour to make them of some practical worth—if the slight details we have given of what some men amongst us have thought, and are now thinking on the important subject, will set others thinking also, till the impulses of thought give life to the labour, and willingness to the work, which will best develop its projects, and aid its onward progress.

R. S. B.

THE JANUARY FEVER.

There are some men who always dread the 1st of January. The thought of it causes the turkey to disagree; the sauce to the Christmas pudding wants flavour; nothing, in fact, is right either within or without. There is a certain testiness of temper, accompanied by a nervous restlessness as the day draws on. The sudden entry of a servant, a ring at the bell, or a sharp rat-tat at the door arouses disquietude. There is a great indisposition to be seen in the haunts of men; long solitary walks or rides in lonesome neighbourhoods are resorted to, terminated by very late tea-dinners. The postman comes to be regarded with aversion; the housemaid with suspicion. The delivery of letters, once a welcome circumstance, is now a painful fact; and as though they contained a sealed doom, many are allowed to lie day after day unopened upon the mantel-piece. These are all symptoms of the January fever. We have known the complaint aggravated by such occurrences as the following:

MAID: "Please, sir, Mr. Jones has called, and will be thankful if you will settle his little account, as he has a large amount to make up to-night."

MASTER: "Confound Mr. Jones; I paid him last week."

MISTRESS: "Yes, dear, but was not that the account for the year before last?"

MASTER: "Last year's account or not, it's confoundedly impertinent to come to trouble a gentleman two weeks running. Tell Jones I'll look over his bill and send him a cheque soon."

[Exit maid.]

(Jones walking away. "Soon, eh? next year.")

MISTRESS: "I wish, dear, you had not got that hooded chaise, we could have done very well without it, as I told you, and now we have all the trouble of paying for it."

MASTER: "Well, it would perhaps have been as wise not to have ordered it, but the cart was very shabby; besides, Jones had just set up, and I wanted to encourage home trade; it's nicely made, and has got him many orders amongst our friends; and this is his gratitude. Confound him!"

MISTRESS: "But you see the carriage was sent in last January, so he has waited twelve months."

MASTER: "And if I had gone to old Barouch at —, he'd been glad of the job, and let the account run three years."

MISTRESS: "You left him, I thought you said, because he charged so high."

(The conversation changes.)

Mr. Jones, as will be seen, was a coach-builder, and a neat thrifty hand. His capital was small; his principles were good; he employed but little labour, and worked assiduously himself. He knew that the foundation of a good honest trade was to lay in a large stock of wood, to as to work up nothing but well-seasoned stuff.

"To be sure," as Jones said, "it was cheaper to use green, and many did a very large business with a very slender capital in this way; one might say with no principle at all; putty might cover a multitude of defects, and make a bad thing look cheap, but he would work with good stuff." And so he made the greater portion of his capital fast, leaving, like a wise man, a nice little floating sum to meet current expenses. A good and an obliging workman generally secures a fair share of patronage; and so did Mr. Jones. For two or three years his prospects were bright, but the fourth year, when he is introduced to us, he looks anxious. There's a deal of money out, £40 here, £30 there; £20 in that place, and £60 in another. Some has been due two years, nearly all of it twelve months; and men's wages have kept on, and housekeeping expenses have continued to soak up the little floating sum, until the day when Messrs. Timber's traveller is advised to him, and what is to be done? The half-year's account is somewhat heavy. His wife advises him to call and state his case to some of his best customers. Very reluctantly he collects a few of his bills, and takes his hat. It goes very much against the grain. "I'm more at home in the work-shop," he thinks. The lady who is looking out of the window of the second house upon which he has desigus, says to herself, "What an unusually long interval between the foot upon the doorstep, and the ring at the bell." And so it was, for poor Jones had been repulsed from the first house as though he had requested alms; his bill was taken, and the door shut in his face. He therefore pauses a little before he summons a second insult. "Well, here goes."

JONES: "Is Mr. —, at home?"

MAID: "No."

JONES: "When will he be at home?"

MAID: "Next week."

"Too late," sighs Jones, and proceeds.

At a few places he is successful. By some he is requested to call again; but not unfrequently his presence is the signal for a scene like the one we opened upon.

The day following Messrs. Timber's traveller appears as per advice.

TRAVELLER.—"Good morning to you, Mr. Jones. Business brisk? Got my advice, I suppose?"

JONES: "Yes I did."

T.: "Well, I'll look in after dinuer. You'll have your order ready, and then we'll settle the account."

JONES: "I'm sorry I can't be so punctual as usual; but I can't for the life of me get my money in. Though I was out all yesterday looking after it, I have only made up half the sum due."

Mrs. JONES: "And I do think it very hard, when it's our own."

T.: "Well, never mind, my boy; we will draw a two-months' bill on you, and that will settle a difficulty

many a better man than you has to settle in the same way."

JONES: "And suppose I don't meet it in two months!"

T.: "O, but you will. Tat-ta, be ready when I look in."

The bill was drawn, but whether Mr. Jones met it we cannot say. We know, however, that many bills drawn under the same circumstances are not met—that many names for the same reason figure in the *Gazette*, and that many men thus are doomed to ruin.

And this is not only true of Jones, but of good honest men in fifty different trades. Why, do we not read in this very 4th of January's *Times* an account of the Sultan's being mobbed by three hundred creditors, who had supplied the palace with food, and could not get paid? A deputation of three was admitted to an audience. No money was forthcoming; promises were given, and the majority of the three hundred within a week were in consequence sold up, and reduced to hopeless poverty.

The relation between the wholesale and retail trader on the one hand is very exactly defined—punctuality is the soul of that connection; while, on the other, between the retail trader and his customer it is unusual to recognize the existence of any relationship. The regular demand of the wholesale house is not to be trifled with; but when the retail trader seeks for the means to satisfy it, his customer oftentimes proposes pleasant games at Hide-and-seek, Bo-peep, and Tom Tiddler's ground. If a gentleman declines to pay, the course is clear; but if he promises to pay, and yet delays to do so, the course is not so clear. And the credit system of this day enables men who are up to the game to maintain a splendid appearance upon nothing of their own, save a prodigious stock of impudence. Many great shams of this sort have lately been caught and ripped up, displaying an emptiness past belief. Such men are found to glory in their shame, and exalt to a science the mean tact that averts a just claim. Timon has many faithful associates who ease their consciences with the following formula—Debt is exchange, and exchange is no robbery.

Far be it from us to charge the generality of those who are in the habit of running bills with any design to defraud or injure the tradesman. Nothing of the kind. But yet it seems to us that the fact of a bill just means this: when the articles mentioned there were ordered there did exist a present inability to pay for them; and if so, it becomes a question, particularly if they were articles of mere luxury, whether they should have been bought at all. If there is any difficulty in paying for them at the end of six months, without question they should not. The facility is so great, that people go on buying without thinking what they can afford; and for want of calculation or self-denial in this respect they imbitter their own days, and impoverish those whom their custom, if properly regulated, is designed to benefit.

We put it to our readers, whether it is honest to take long credit on articles sold for cash, so to make up the deficiencies of a small capital, at the expense of the gro-

cer, the butcher, or any other trader. This is not called roguery, but it is very much like it; and the "*home-trade*" would certainly be more thriving without such doubtful patronage.

There is one class of men with absolutely no excuse for this conduct. The farmer's is essentially a ready-money trade; and they are placed in a most favourable position to bestow the same benefit upon those dependent upon their custom. On the whole, we believe them to constitute the safest class, and the best paymasters in the world; but the pride of a large holding dims many a man's better judgment, who seeks in the credit system a means to avert the consequence of an error, and finds in it only destruction to his peace of mind. There is, too, a disastrous tendency to speculate in corn with other people's money. Mr. —, who put his sample into his pocket to-day, and determined to wait for "the turn," did not think, perhaps, of the sore shifts to which several individuals will be reduced, by having thus to wait for their money.

The 1st of January should be a day of joy and hope to every one; but to those who see in it only an accumulation to the heavy drag-weight of debt, that bears down their heads before the public gaze, from which they shrink, it may well seem to cry, "I come with renewed claim—sharp angry claim—no peace I bring thee."

There are many now suffering from this January fever, and in various degrees. Amongst them there are those who need our sympathy, and there are those who do not deserve it. Some are chronic long-standing cases, said to be incurable.

To those whose symptoms allow room for hope, particularly to those who have only begun to experience the remarkable uneasiness that distinguishes the attacks of this malady, we beg leave in our medical capacity to hand the following prescription:

PAY YOUR DEBTS.

--to which we append these directions.

Do not buy what you do not want. Pay cash for what you receive, if you can; and if you cannot, make a point of doing so before six months have run.

In case this advice is taken, we guarantee a cure, and can most positively predict a Happy New Year.

WINDOWS OPENED MORE WOULD KEEP DOCTORS FROM THE DOOR.—A very large quantity of fresh air is spoiled and rendered foul by the act of breathing. A man spoils not less than a gallon every minute. In eight hours' breathing a full grown man spoils as much fresh air as seventeen three-bushel sacks could hold! If he were shut up in a room seven feet broad, seven feet long, and seven feet high, the door and windows fitting so tightly that no air could pass through, he would die, poisoned by his own breath, in a very few hours; in twenty-four hours he would have spoiled all the air contained in the room, and have converted it into poison. Reader, when you rise to-morrow morning, just go out of doors for five minutes, and observe carefully the freshness of the air. That air is in the state in which God keeps it for breathing. Then come back suddenly into your close room, and your own senses will at once make you feel how very far the air in your chamber is from being in the same wholesome and serviceable condition.

THE PULPING OF ROOTS—ITS TRUE USE.

The modern system of reducing roots to a fine pulp before being given to stock for consumption, has now become general. It therefore behoves every stock-master to look closely into the subject, in order to ascertain its comparative advantages, and the best mode of preparing the food. It is unquestionably an expensive process, and the return of profit ought to be commensurate. I think to pulp roots for every kind of stock would not pay; but selections of stock may be made upon every man's farm, that would admirably answer for the additional outlay. So far as I have been able to ascertain the results of the pulping system, it is something like the following: All kinds of stock, including horses, are benefited by consuming this pulped food, as compared with it in any other state. Horses are more advantaged by using it in a fresh state, mixed with chaff. Cattle should have it administered in a slightly fermented state, and mixed with chaff, which is to be thoroughly incorporated and saturated with the juices or watery particles of the pulp. Sheep and lambs require its being divested of those watery particles as much as possible; hence the very process of pulping is desirable for this purpose, and then it should be thinly spread over a floor for a few hours, to promote evaporation. Pigs eat it readily, and in its fresh state, mixed with meal, to great advantage. Poultry prefer it fresh. Calves and young cattle should have it evaporated awhile, and then mixed with hay-chaff. These are the plain facts. Now let us look into the various methods of preparing the pulped food.

First, as food for horses.—The great danger in the administration of this food arises in the excessive quantity of water of which the mangold and turnip are composed; but particularly the former. In preparing it for horses, a convenient floor should be appropriated; the pulped roots should be mixed with fine chaff, and then be left to saturate or absorb the watery quality of the roots into the chaff. It will be ready for use in a few hours, and should then be sparingly given in the manger or boarded crib. Working-horses will require a little corn with the mixture; but young horses thrive well upon it, with straw or other similar food. The proportions for horses should be, in bulk, about two-thirds chaff to one of pulp. In preparing the food for cattle, two distinctions should be observed: Young cattle must partake of a larger porportion of dry food, *i. e.* chaff, or scouring will result. The proper mixture for fattening cattle will be about equal parts in bulk, *i. e.*, two bushels of chaff to two bushels of pulp; while for young cattle it ought to consist of three bushels of chaff to one of pulp, and in both cases it should undergo a slight fermentation. In feeding them, great care should be taken not to overdo the animals; and if any is not eaten, let it be taken away, and the crib left to sweeten till next feeding; otherwise the crib gets a nasty odour, and the animal will never lick it clean, or feed pleasantly out of it.

In preparing it for sheep, it will not be requisite to use chaff at all, although the better for the mixture; but simply to use such means as may appear desirable to extract from it those deleterious watery particles which cause looseness and scouring. For pigs the pulp will only require mixing with meal, without the addition of water. I think for fattening stock of all kinds, it should be fermented; the food undergoes a chemical change, and some improvement; saccharine matter is engendered; and if no further result is obtained, the process of digestion is commenced before the animal has partaken of the food. It has also been found that the majority of animals prefer the fermented to the fresh food. Cows are said to partake of this food without any deleterious effects to the milk or butter.

Fermentation.—This will commence immediately after the pulping, and in cold weather it will be about from twenty-four to thirty-six hours before it is quite ready for use; in mild weather about twelve hours' fermentation will suffice. The common practice is to divide a convenient floor into sections or compartments, and lay the pulp in three separate divisions, so that they may be carried to the stocks in succession, so that one day's food is always in hand; but for the Sunday I should mix the fresh pulped with the oldest fermented mass, so that both may be equalized. On no account should the fermenting mass be permitted to wax hot—merely warm. The fermentation of the pulped roots has the effect of turning a portion of the starchy matters into sugar; just, I presume, the very thing required to add nutritive value to the food. And the further admixture of chaff, similar dry food being well incorporated and saturated with it, adds still greater nutritive value to the heap, which is then precisely in that state wherein it is most readily digested by the animal, and from which it can derive the greatest aliment in the shortest time, thus leaving it additional liberty and time to rest and more quickly thrive. This admixture of dry food, as chaff or other solid food, is almost imperative, or looseness or scouring will take place, and disappointment will ensue. In very cold weather it is most desirable that the pulped food should be warmed by fermentation, and the mixture of chaff more liberal. It is perfectly compatible and true that a large feeding of cold roots, unmixed with dry or strawy food, cannot be beneficial to any animal in severely cold weather; it then tends to cause flatulency, colic, and indigestion. To pulp all the roots grown on the farm is almost impossible. Fancy crops of from thirty to fifty tons of mangolds or turnips per acre, upon a large breadth, being passed through our present pulpers! It would be extravagant, and nearly useless in many cases. For instance, common white-fleshed turnips are readily fed off by sheep: I should not undertake the expense of collecting and pulping this crop, although the sheep would in some respects be advantaged by it. I think it unnecessary expense, because cutting would do nearly as

well, and moreover store-sheep would thrive even if let alone to provide for themselves. The great thing is to suit the food to the stock, and the stock to the food; no one would think it best to give very costly food to inferior animals or breeding stock, as a rule. The selection of the animals or class of animals must be left to the judgment of the farmer. I would suggest that all kinds of young stock requiring a little extra nursing be included—young calves and stirks, cull lamb-hoggets, also aged ewes, and old cows. But the most important classes are those of animals requiring to be quickly fattened; for these classes the system has very great advantages, and it cannot be too extensively carried out, nor too carefully practised. It is what I would designate the "topping up" system, and I would bring all animals up to it by degrees; for instance, I would use a turnip-cutter up to a certain point or stage in the animal's fattening, and then commence with pulped food to com-

plete the process; or, on the other hand, in the case of animals as above, that require nursing, I would give them pulped food till fairly brought round to a healthy thriving state, and then give them cut food; this merely on the ground of expense. Milch cows will pay well for this extra expense; and what is better, the process of pulping appears to give off so much of the watery particles containing the peculiar flavour of the root as to prevent any ill effects or odour to the butter.

In concluding this short paper, I would say once for all, that pulping roots in the early part of the winter is unquestionably much to be preferred to cutting or slicing, and is as a general rule also far more advantageous, but it is more expensive. The great question therefore, in the every-day experience of the farmer, will be, to decide as to what stock he will give pulped food, and to what he would give cut or sliced food, and, further, what he will leave to provide for themselves.

THE STEAM-PLOUGH—ITS RISE AND PROGRESS.

Tracing a mechanical invention through its early history and first attempts, with a view of fixing the exact date of its birth, and determining who were the real parents, is something like searching into the origin of evil. You never can make out how it was that the first step was taken, or what suggested the novel idea. And if you meet with the originator, as you suppose, it is sure to turn out that similar schemes existed long before his, and that there actually is "nothing new under the sun."

The question, "Who invented the steam plough?" is one of this kind; but we think a far more practically useful inquiry just now is, not Who first tried and failed? but Who is at present able to give us the best realization of the old ideas, combined with improved new ones? However, though there are difficulties attaching to the settlement of priority of invention, it is sometimes possible to trace the progress of a single ingenious mind; and very interesting and instructive the history often is. Mr. Smith, of Woolston, has told us how, having devised a new mode of tillage—the fruit of much meditation and practical trial—he longed for some means of yoking steam-power to his implements; and caught the idea from witnessing the novel operation of the draining-engine at the Lincoln Meeting. Other experimenters had preceded Mr. Fowler and Mr. Smith; but that ingenious machinery—so cleverly combined, so beautifully simple, with its engine and winding barrels neatly built together on one set of carriage-wheels, its pulleys firmly anchored, and smooth-working wonderful wire-ropes hauling onward that immense implement hundreds of yards distant from the motive power—that machinery made steam culture a practicable matter in the eyes of every clear-seeing man of business. The Royal Agricultural Society of England's judges wrote: "The trial of these immense implements could not fail to awaken much interest in our minds. A small six-horse engine with comparative ease performed the work

of 150 horses, drawing so regularly that no oscillation was observable. 'Surely,' was our remark, 'this power can be applied to more general purposes.' We earnestly commend this idea to our engineers and machinists." "Applied to more general purposes"?—of course it could be. Here stood a portable engine, not in a yard, but in a spacious field; not beside a wheat-stack, but upon a piece of ground that wanted draining. No strap to drive a thrashing-box or mill, but spur-wheel gear, working strong coiling-drums, hung in a framing fixed to one end of the boiler. Why, then, any mechanism we like may be similarly connected with a common engine! And to move an implement, the engine need not travel, as we used to think was a necessity of the case, and a necessity nobody knew how to get over, on arable uphill and downhill fields—for there stands the engine puffing away in the corner. For pulling the plough, the toughest hemp hawser would be useless; it would wear out in no time: chain, again, wraps so jerkily on the barrel, and besides would lose all the power, in dragging so heavily along the ground. But that metal rope, quite flexible round the great pulleys, strong as you please, and lasting a long while where flints and hard limestones do not rasp it so much; that, made lighter for shallower operations and easier draught, is just what we have been waiting for. The anchorages are readily set down or removed; and with what a tremendous purchase they grip in their holes! how easy to make a slighter fixing, on the same principle, for ordinary tillage! And the huge implement, too—how steadily yet resistlessly it moves! What an unheard-of depth that massive coulter is penetrating! Why steam power might subsoil to any pitch, and could trench our lands like market-gardens! The soil trembles for yards on each side; the coulter and wedge-mole are making a little earthquake down below. Depend upon it, steam-subsoiling would loosen and shake, and let in air and rain-water, in a manner never thought

of before. Yet, no matter how profoundly the tool sinks, or how stubborn the mass of cohesive clay forced through, the workmen can steer in the requisite direction with that clever adaptation of the woodman's "gin," by altering the lock of the wheels. Could not some mechanist contrive a plough to go straight, while following at the end of a wire-ropé? Thus the draining engine was wondrously suggestive. And Mr. Smith, of Woolston, imbibed ideas which, instead of committing to print, he perseveringly carried into practice—with results the most astonishing and invaluable.

But let us look at Mr. Fowler's own course, as an inventor: that is, in matters which have come before the public in connexion with steam power field-work. And, indeed, every farmer now-a-days ought to be perfectly familiar with the principles of construction of the different kinds of steam-tilling apparatus, or he is apt to misjudge the reports of progress that reach him; thinking he knows the "steam-plough" pretty well, having seen it half-a-year ago, when, in fact, almost every month it is coming out with important modifications. We hope our readers will keep up their mechanical knowledge of what is going on in this important department of agricultural improvement; particularly as we find even our old correspondent the "Old Norfolk Farmer" inadvertently stating that "Messrs. Fowler's and Smith's systems are similar to each other in all respects, I believe, except that the former works with a plough and the latter with grubbers."

In the autumn of 1849, Mr. Fowler's attention was drawn to the great expense of laying drain-tiles in the ground; and he determined to substitute machinery for the manual operation, if it were possible. Lumbert's mole-plough figured in the "Annals of Agriculture" many years ago. The practice of mole-ploughing was common in some heavy-land districts; and it appeared to him that there would be no difficulty in making the same machine draw in some material to be left in the hole made, and thus form the drain. Mr. Saul, of Garstang, had proposed such an idea years before; but it still remained to be actually realized. It is not necessary to detail all the various experiments of the inventor's novice. All the tackle that could be procured was far too weak to answer the purpose. Chain and hemp rope were tried; but when strong enough, were found to be of so great a weight as to render moving about impracticable. Recourse was then had to wire rope; and in July, 1850, Mr. Fowler was able to bring before the Royal Agricultural Society, at their Exeter Meeting, a machine that would bury drain pipes made of wood to the depth of 2½ feet. The windlass was a travelling one, worked by horses going round and round—and propelling itself by winding along a rope laid out in the required direction anchored at the end. The drain plough followed the moveable windlass—the horses walking in a series of eccentric circles, or, more properly, spirals, and so gradually passing up the field. Into a description of the drain-

plough itself, the construction of the windlass, the contrivances for manufacturing the wood pipes, &c., we need not now enter. The great inconvenience in adjusting the rope to the length of the field, the difficulty of keeping it tight enough to cause sufficient friction on the winding barrel, and the wear and tear caused by the friction, led at once to the abandonment of this plan of windlass. A remarkably simple and easily portable capstan was then made. This, stationed on the headland, coiled the rope upon a drum, the vertical axis of which carried the four arms or levers by which the horses caused it to revolve. Two men in five minutes can raise and pack this windlass ready for removal; and when properly fixed, with its broad iron plate let into the ground and a strut set out at an angle to hold the machine upright, it is capable of resisting all the power of four horses working with a leverage of twenty to one. For applying horse-power to occasional heavy field-labour, such as pulling down forest trees, or removing cannon or stores over a difficult country, a more compact and effective windlass cannot be desired. The plough was also improved in form and capabilities. Experiments also showed that ordinary earthen tiles could be laid with ease and accuracy (which had previously seemed doubtful); and in the spring of 1851 the plough was perfectly competent to perform drainage on good cutting clay soils, in some cases four feet deep, as shown on Wormwood Scrubs, near London. But the principal fact demonstrated (as bearing upon the present subject), was the practicability of managing great lengths of wire rope in a field, with comparative ease—the plough being often drawn a quarter-of-a-mile from one fixture of the horse-power windlass.

In 1853 it was determined to apply steam-power to the draining plough. The first attempt was *not* that which our readers saw at Lincoln in 1854; but the engine, windlass, and plough were all combined in one carriage adapted to travel over the land. The winding apparatus was attached in front, and driven by gearing from the engine crank-shaft, while the plough followed behind—the rope being stationary, and anchored at the end of the drain. Thus, the usual habit of beginning with steam just where you began with horses, was adopted; but with a similar ill-success; for the travelling steam windlass answered no better than the travelling horse windlass, though for a different reason. The great weight on hilly land, and the impossibility of managing such a ponderous machine in the field, rendered it impracticable, and it was accordingly abandoned at an early stage. Mr. Fowler then decided to fix the engine and windlass in one corner of the field, pass the rope along the headland and round a pulley anchored at the head of the drain to be cut; a smaller rope being passed round another pulley at the bottom of the field, so as to be hauled out when the larger rope was being wound up, and thus be ready to pull the larger rope and implement back again when the drain was finished. This method worked very well, at once proving the perfect feasibility of applying steam-power to the purposes of

ordinary cultivation, and was exhibited at the Lincoln Meeting in 1854.

The next improvement consisted of a more powerful anchorage, in which two boards were hinged together, back to back, and placed in a hole 6 feet wide and 3 feet deep; the chain from the pulley tending to force the pair of boards open in the hole (like a pair of "tweezers" or "sugar-nippers" opening outwards); and these pressing against both sides, gave a very firm holdfast capable of resisting a pull of ten tons. This arrangement of tackle worked very well at first; but wire rope of the great thickness necessary to bear the greatly increased strain could only be used advantageously over pulleys larger than could be moved in the field—sheaves of a small diameter bending the rope so much that it would not last any great length of time. Accordingly, the system of leading the rope round pulleys was altogether relinquished; and an engine and windlass combined was made to move itself along the headland so as to come to the head of each drain in turn, and, there standing, have a direct pull on the plough without passing round any pulley. A winding drum was placed on a vertical axis underneath the boiler of an ordinary portable engine, and driven from the crank-shaft by an intermediate shaft with bevil gearing. When the rope was wound up, and the plough arrived at the engine, it was drawn back again to the bottom of the field by a horse, while the engine shifted itself onward ready for making another drain—this movement being effected by a small drum and a rope anchored on the headland. This plan is still in use; and a drain half-a-mile in length has often been put in by it from one fixture of the machine.

Everybody ought to be familiar with the mechanics of steam ploughing. Accordingly, we have given an outline of Mr. Fowler's progress with the drain-plough, as the foundation of our present success in windlass and wire-rope cultivation. The first form was that of a travelling windlass, actuated by horses walking round and round, while the machine slowly advanced along the fixed rope, dragging the implement behind; and then came a stationary capstan, worked by horses, with the rope led round a pulley anchored at the head of the drain. Steam-power being applied, it went through the same mode of operation: the engine being first made to travel in front of the plough, by winding up a fixed rope: then it was stationed in one corner of the field, and hauled the plough up the field and back again by two ropes led round a pulley at each end of the drain. And, lastly, going a step further than the horse-windlass had done, the pulleys were abandoned; the engine, with a coiling drum underneath, was made to stand at the head of the drain, pull up the plough, then move itself onward to the next drain, while the implement was drawn back again by a horse.

Very similar have been the successive stages of advance made by Mr. Fowler's steam-plough. And as we are noticing, on the present occasion, Mr. Fowler's machinery only, we shall be doing no injustice by passing over Mr. Haunam's trials in 1844, Lord Wil-

loughby's or the Marquis of Tweeddale's steam-plough, or Mr. Williams's experiments in 1852, and Mr. Smith's working of his cultivator with the windlass, &c., supplied to him by Mr. Fowler in 1855. This tackle consisted of an engine, and a windlass on a separate frame, in which two drums on a horizontal axis were driven by a belt from the engine fly-wheel; but otherwise differing only in strength from the windlass adopted in 1853 and 1854 for the draining-plough. These were stationed at one corner of the plot to be cultivated; and the rope, laid out in a triangular form, passed round three anchored pulleys, two of which were moveable, and shifted, as the work proceeded, into holes dug for the anchors to hold by. The first trial was with a scarifier, which it worked well, turning it round at the headlands with ease; this being accomplished by attaching both ropes to the front of the implement, so that it turned round of itself when the ropes began to reverse their pull. The next step was to consider the best mode of applying the newly-found power; and the much-despised plough, in its different modifications, seemed the most likely instrument for accomplishing this end. In using the ordinary plough, if turned in the same furrow, that one furrow is turned over one way, and the next the other way, leaving an open "drill" or "ridge;" and to make a number of furrows lie the same way, it is necessary to take the plough some distance along the headland before turning to go back again; but this plan is impracticable with steam-power, there being no means by which the implement can be moved along the headland, except by very cumbersome and delaying arrangements, or extraneous labour. The turnwrest plough, to be sure, laid all its slices in one direction; but to employ several such implements at once, in their common form, was out of the question. Mr. Fowler therefore had recourse, as others had done before him, to two distinct sets of ploughs, one "right-handed" and the other "left handed;" and, by a simpler device than any other inventor had then or has yet arrived at, he fixed the two sets of shares and mouldboards rigidly at opposite ends of a long frame, and balanced this frame upon a pair of large carriage-wheels. By this arrangement, when one set is in work, the other set is in the air; and the one are simply brought down, and the others simultaneously raised, for going in the opposite direction; and while there is weight enough to keep the ploughs in work (with the horizontal and low pull of the rope, instead of the angular uplifting draught of horses) there is not enough to cause that sledging pressure which in common ploughs augments the draught and injures the subsoil. The steering of the implement was awkwardly effected by a man walking in front with a long pole or handle to guide it by. A new form of windlass was found necessary; for previous experience in draining had proved that the crookedness of the fields, and the varying angles at which it was required to plough, in order to render the machine generally available, rendered it essential to mount the winding-drum on a vertical axis instead of a horizontal one; it being evident that a rope will wind on an upright drum from

any part of the field; but on a horizontal drum, the rope must either lead off always at right angles to the axis, or else be coiled on with much friction by a to-and-fro traversing winding apparatus. The windlass was accordingly made with two vertical barrels, with intermediate reducing wheels and a rigger driven by the engine strap. The engine and windlass were set down midway along one side of the field, and the ropes led off in an angular direction to two pulleys anchored one at each end of the work; these being shifted forward along the headlands for every fresh bout of the plough. The anchorages for these pulleys were then and still remain in the form of trucks or eart bodies, each having four sharp discs for wheels, which, cutting deeply into the ground, present a great resistance sideways to the strain of the ropes, but may be easily pulled forward through the soil in a forward direction. The large sheave or "pulley" was attached underneath, and the anchorage weighted with soil to hold it down in its place. The shifting of the anchorage was effected by a small wire rope laid along the headland, passing round an anchored pulley in the corner of the field, and then along the side of the field to the windlass, where a couple of small grooved rollers acting as a "Spanish windlass" were employed when required to pull the rope a few feet, so as to haul the anchorage opposite to the next line of furrows. In the year 1856, this machinery was exhibited at the Chelmsford Meeting, and also at Paris. By the latter end of that year a great improvement was accomplished. The supporting wheels of the plough were made to "lock": and thus a man, riding on the tail of the implement, could steer to a nicety by means of a small toothed rack, worm, and wheel. So perfect is this mode of steerage, that the plough may be directed entirely out of the line of draught, until the rope stands at an angle of one in two to the direction of the plough; and accuracy in setting the draught is no longer needed. The anchor-carriages had also been made self-moving, so as to save time in working.

Instead of the ropes from the fixture capstan being led off at an angle, as before, they were made to enclose the plot of land in a rectangle, thus requiring two additional anchors (that is, making four altogether), fastened down at the corners of the field; and as the draught-rope passes along the headland, it tends to draw the anchorage forward. All that was required was a mooring-chain behind the anchorage, to regulate how far it should travel at a time. But Mr. Fowler did not stop there. Hitherto a common portable engine had been employed, driving the windlass by means of a belt: but two anchors, two snatch-blocks, supporting friction-rollers for the rope, the windlass, the engine, and an extravagant quantity of rope, were tediously and expensively shifted from field to field; and the whole apparatus required to be simplified in order to reduce wear and tear, and liability to contingencies. Accordingly, in the early part of 1857, a windlass-frame was contrived, carrying an ordinary engine upon it; this was made to travel along the headland, propelling itself when required, by a small

barrel winding up a rope anchored a-head, opposite to one anchorage at the bottom of the field, the ropes passing simply side by side from the engine to the anchorage, working the plough to and fro between. At Salisbury Meeting, in that year, this arrangement of tackle was shown, the engine driving the drums by shafts and gearing, and being also locomotive, along roads and fields by actuating one of its broad-felloed carriage-wheels. Another form of combined engine and winding-drums was also exhibited, in which the machinery was "self-contained," or all attached directly to the portable engine boiler, without the boiler itself resting upon a framing. The anchorage propelled itself by a barrel and fixed chain, the barrel having a slow rotation given to it by a screw and worm-wheel, and subsequently by bevelled gearing worked by the revolution of the large sheave or rope-pulley. But though very successful ploughing was performed with this improved machinery in many parts of England, and winning the Highland Society's prize at Stirling, another form of apparatus was demanded for applying the steam-plough to the common portable engines already in the farmers' hands, in cases where the farmer might not be prepared to have his engine taken off its wheels and fixed upon a windlass; therefore, in the autumn of 1857, a windlass was constructed which could be temporarily connected with the engine (with its fore-carriage removed), embracing one end as in a pair of shafts—similar in principle to that designed by Mr. Williams. A driving-strap communicated motion from the engine fly-wheel to a rigger upon the windlass frame. However, in the spring of 1858, Mr. Fowler abandoned the use of winding-drums altogether; and instead, passed an endless rope several times round two grooved drums: thus obviating the wear and great crushing pressure of the rope in coiling many times upon itself, together with the irregular motion, which tended to breakage; and securing an equable smooth motion, and a "safety valve" slip of the rope under great and sudden strains from the impact of the implement against roots or stones. A short reserve of rope was carried upon two small barrels on the plough, which is let out or taken up according to the varying lengths of furrow; and sections of rope are added or removed so as to adapt the length engaged to different-sized fields. At the Chester Meeting this form of machine was worked, and also subsequently, with the greatest success, the windlass-frame being made to attach to or detach from the engine in a few minutes. At the same meeting was shown a remarkably light and compact form of windlass attached round the fire-box of a common portable engine, only one of the drums being driven by gearing, rigger, and strap. But still Mr. Fowler was not satisfied; and during the late Christmas Show-week, we had an opportunity of witnessing in operation at Stratford the same arrangement of two grooved drums permanently affixed underneath a common engine-boiler, by marvellously light and simple attachments. The driving-strap is dispensed with, and one drum actuated by a shaft and bevel-gearing from the crank-shaft;

and the entire weight, in addition to that of the engine, does not exceed three-quarters of a ton. A new mode of working and turning a grubber, scarifier, or paring-implement has also been contrived; and if simplicity of parts, easy portability, cheapness of first cost, and economy in operation are the great recommendations of any steam-cultivating machinery, Mr. Fowler need not

wish to make any further progress, beyond the extension of this last improved apparatus through the length and breadth of our land. Having done his part towards the solution of the long-standing problem, he must be gratified to feel that agriculturists are beginning to approve and appropriate his invention.

WHAT KIND OF CORN AND CAKE ARE THE MOST ECONOMICAL AT THEIR PRESENT PRICES FOR FEEDING SHEEP ON ROOTS?

At the Oxford Farmers' Club this question was introduced by Mr. OSBORNE, who said it appeared to him that a Club consisting of 400 members ought never to be without a subject for discussion, and, therefore, in the absence of one, he had ventured to introduce this, hoping that it would elicit from some of their leading practical men that information which was needed for the proper and profitable cultivation of the soil. In considering this question, he divided the community into two great classes—the producer and the consumer; the producer was the farmer, and the rest were the mass or consuming body, for whom the farmer provided. It happened this year that generally speaking, there was a short crop of beans, and the consequence was, they ran up in the market to something above the price of wheat, and up to the price of barley and other food, which went to the sheep-fold to produce good mutton and wool. In the great consuming body, the two largest customers were the baker and the butcher. At the present moment, the baker was liberally supplied with all he required to feed the increasing population, but the butcher was not so. They were supposed to know the price of mutton and wool, and the common remark was—"Bread is cheap, but how dear meat is." Now they did not want to pay 7d. per pound for mutton, but would prefer to have more mutton at a lower rate, and keep the bread a little higher than it was. They were bound, then, to keep this balance, looking at the present price of corn, which was less than £10 a load. Barley was much the same price as wheat, but beans were higher, and for that reason he was in favour of wheat for sheep, as it was well adapted for producing mutton and wool, for he found from tables, giving the comparative nutriment contained in various articles of food, and denoting the proportion of nutriment in every 1000 parts, that wheat yielded 950; peas (dry), 930; barley, 920; beans (dry), 890; and oats, 742—by which it would be seen that wheat took the precedence of all. With respect to peas, he had found that railway contractors fed their horses upon them, because they contained more nutriment than any other food usually given to horses, which fact served to confirm the accuracy of the tables which he had already referred to. Some persons had a great objection to give wheat to sheep, but he had tried it, and never found the slightest harm or loss from using it. He commenced by taking his sheep home, and starving them down till they became used to bran and water, and when that had gone through their system, then he used wheat. He gave them a pint, or 1 lb. per head, per day; and if they adopted the plan of starving them down to it, and preparing their system, they would find no loss, but if they did not do so, and threw in a quantity, some of the sheep would perhaps take a quart, which would do them an injury, while others would get none. Looking, therefore, at the present price of wool (£2 per tod), it was to their interest to grow all the wool they could, and if they could feed the

people with more mutton and less bread, they would be only doing their duty. With regard to cake for sheep, he believed that the best description of oilcake was the best and most economical for that purpose, and that if they did not use the best description, they would have to pay the penalty. At the same time, he was bound to say that when he gave his sheep a mixture of wheat, beans, and cake, they picked out the wheat, and left the beans and cake, clearly showing which they preferred; and, therefore, the less they went against nature in feeding sheep the better. Mr. Osborne concluded by moving, "That of all kinds of corn, wheat, at its present price, is the most economical for feeding sheep on roots, and of cake, the best oilcake for the same purpose."

The Rev. J. CLUTTERBUCK observed that in considering this question it was necessary to bear in mind the per centage of nutriment in different kinds of corn, as it was evident that one contained more than another. It was generally supposed that if they gave wheat to animals it would have a tendency to heat them, and, therefore, few gave it alone; it might be found necessary and advisable to mix it with other food which gave meat and muscle, for wheat gave bone, containing, as it did, phosphate of lime. The ashes of a large swede would lie in a man's hand, and consisted of phosphate of lime, of which animals were made, and substances of which they were made they would consume; and, therefore, it was necessary to consider what food was most consistent with the nature of the animal itself. There was nothing so nourishing to man as wheat, but it had been considered a sin and a waste to give it to animals; but they gave their pigs offal, which now it was very difficult to procure; and what nourished pigs would do the same for sheep, and, therefore, he saw no reason why wheat should not be consumed in this way as well as in any other. A friend of his, who had been remonstrated with for giving his pheasants barley, vindicated it by saying that he consumed the barley himself, for he ate the pheasants (laughter). If the feeding properties of wheat were so much greater than other corn they could afford to give a better price for it. Some parties objected to grow certain descriptions of wheat which was very productive, but, at the same time, was coarse; but if they could grow 6 quarters to the acre, instead of from 4½ to 5, it might not be a bad sort for feeding purposes. When he visited the Paris Exhibition, he met with some Algerian wheat, and he had found it, if not fine, at least very productive, and not a bad wheat for feeding sheep, for he obtained some of it, and had grown it; it came from the north of Africa, which used formerly to be the granary of the world. It was well known that they could grow corn in proportion to what they returned to the soil, and if they did not return to the soil what they took from it, it would soon be beggared. He had seen land where the subsoil was well calculated to grow corn, but it would not stand up, because it wanted strength in the first place. As they could not take

wheat out of the land without returning wheat to it, he thought that the best way was to consume the wheat on the land, and for these reasons he had very great pleasure in seconding Mr. Osborne's motion.

Mr. JAMES WILLIAMS, of Northcourt, said that the relative price of wheat to that of other food bore chiefly on this subject, which was confined to the feeding of sheep, which must consume roots; and, in order to have a healthful animal, which would yield a fair return for what it consumed, they must look to the effect of the food on the animal itself. Now roots alone were of a purgative character, a large per centage being water; and they wanted to correct that, and the best corn for that purpose had been found to be good old beans, not so much for the formation of fat, but for supplying that which was wanting in feeding on roots. In looking at wheat, they naturally inferred a tendency to scour, which was increased by the consumption of roots. He (Mr. Williams) had watched a flock for some months that had been consuming half a pint of wheat per day; they thrived quickly, and came very heavy to the scale, but there was a tendency to scour, and he had asked the shepherd if he continued to give them wheat, and he told him he was obliged to leave off the wheat because it accured the lambs, and for the last month he had given them clover hay and turnips, upon which they made the same progress; but he (Mr. Williams) doubted whether they did so well without corn as with it. They ought not, however, to look to the effect of any kind of food independent of other food. He had seen a very fine flock of 250, which made 70s. each, and they consumed 1 lb. of oilcake per day, and he had asked the party if old beans would not have been cheaper, but his reply was that, from his experience, oilcake was not only the safest thing to consume, but was cheaper than any other description of food. That was the experience of a man who farmed largely, and who produced most excellent crops. They found from experience that by feeding with new or old beans they lost sheep from congestion of the brain, brought on by indigestion, and thus it was a great question whether beans were equal to, or as safe as, oilcake, which did not produce that effect. He (Mr. Williams) had lambed 550 ewes, when he fattened the lambs with oilcake alone, but his experience with oilcake this year led him to give it up, for it produced a good deal of fever, and they did not progress so well as with split beans. One year he fed his lambs with peas, and he found they did best on old peas, which were not so apt to scour, or to engender disease, as new peas. Then came the question as to whether wheat was the most profitable article to consume for sheep, and, as far as his experience went, beans or old peas were preferable, as being not only cheaper and safer, but possessing equal feeding properties. He could not advocate using wheat alone, for, as such, he did not think it either the safest or cheapest, but it might be used in company with other corn. He disagreed with Mr. Osborne's plan of using wheat alone, and was of opinion that a mixture of one-third wheat, one-third cake, and one-third old beans, would be preferable, as the cake would produce fat, beans made muscle, while wheat would give strength to the general frame.

The VICE-PRESIDENT (Mr. James Walker, of Begbroke Hill Farm) said that, with respect to feeding sheep with wheat, he could not speak from experience, or adduce any facts in favour of it, because he had not tried wheat, but for some years past he had been an extensive consumer of oilcake, and the more he used it the better he liked it. The price of beans was

so near to that of wheat that he strongly upheld the feeding of sheep with beans on roots. Mr. Williams had spoken very favourably of oilcake, but he (Mr. Walker) had found it too loose for sheep in fold, and was in favour of a mixture of cake, barley, and beans. Wheat was intended for human nature, and was best suited for that purpose, and before he used it alone for sheep he should like to be informed, which Mr. Osborne had not done, on what number of sheep it had been tried, and what number of quarters of corn had been so applied? In the absence of that information, which ought to be given before any such conclusion were come to, he should move, as an amendment, "That a mixture of beans, barley, and cake, is preferable as food for sheep.

Mr. G. F. COGGINS, of Coombe, said that this was a subject which required years of practical experience to qualify a man to speak upon, but as he could not lay claim to that, he must confine himself to a scientific view of it. Mr. Osborne had thrown out some remarks on the relative value of certain foods with respect to the amount of nutriment they contained, notwithstanding which, he (Mr. Coggins) was prepared to prove that wheat contained less nutriment than beans, peas, or lentils, which latter contained more than peas, and next to peas stood beans. It was a well-known and ascertained fact, that food which contained the largest amount of nitrogen contained the largest amount of nutriment. Wheat was more adapted to the human frame, but in the practice of farming they must look to first principles; the farmer had to look to the nature of the food he has to use, and to get the best amount for his root crop. He must look to his basis for nitrogen and carbon, but nitrogen was the best, though he must have sufficient of both qualities. Swedes alone tended to scour, because they contained more carbon than nitrogen. Beans and peas formed the best investment of capital; oilcake contained a large amount of carbonaceous matter, and laid on a great amount of flesh and fat. Rapecake had been recommended by some, but it was nauseating to sheep. Wheat was intended as, and was very properly designated, "the mainstay of life," but it did not follow that it was the best for feeding sheep and beasts, for animals ate grass and roots, and preferred them to dry food. They might train an animal to eat any thing, but if they mixed wheat and beans he believed that it would be found a cheaper and safer food than wheat alone for sheep. The manure which was left by an animal constituted the largest profit, and they did not look so much to the price of mutton as they did to the value of the manure left on the land, and by giving beans it formed the manure for the cereal crop. It was no proof because some sheep picked out the wheat that they preferred it; and believing as he did, that a mixture of beans, barley, and cake, was preferable to wheat alone, he begged to second the amendment.

Mr. WILLIAMS remarked that if they took the price of beans at 4s. per quarter, they could get a ton of cake at 10 guineas, which would produce as much as five quarters of beans, whereas they could buy old peas at 38s. per quarter, which would compete with beans. At the same time they could not throw overboard cake, beans, or peas. He had consumed some hundreds of quarters of wheat, but what would feed pigs would not feed sheep, because they had not to contend against the purgative property of roots, which sheep consumed, but which pigs did not.

On a division, the amendment was carried, and the original motion was lost.

HEDGEROWS, TIMBER, AND GAME.

The monthly meeting of the Winfrith Farmers' Club was held at the Bear Inn, Wool, on Wednesday, the 17th November; and the subject on the card for discussion was, "The Importance of Removing Hedgerows, Timber, &c."

Mr T. S. JACKSON, of Rempstone, having been entrusted with its introduction, said: Mr. Chairman and gentlemen, it is probable that many, on looking at the subject for this evening's discussion, may think it of but little importance, and that it might be summed up in a few words by admitting there are a few trees and hedgerows in the country which certainly would be better removed; but, in order to give me a little more scope, allow me to call your attention to the following addition upon the card, the "et cetera." But first a few words about timber. I should be very sorry to give the impression that I am advocating the total annihilation of that magnificent work of Creation, for in many cases I am able to enter into the spirit of that good old English song—

"Woodman! spare that tree;
Touch not a single bough:
In youth it sheltered me,
And I'll protect it now."

I am quite ready to class them amongst the good creatures of God, providing they stand in the right place. Everyone must admit that a handsome bull, feeding in a pasture, is a good creature of God, but what would it be in a china shop? Why, in the wrong place, to be sure; and the sooner removed the better. And we must come to the same conclusion respecting thousands of timber trees standing upon the arable land of this country. I am not a speculating character; but methinks I should like just for once to launch out (if it could be done) and purchase all the timber standing upon the arable land of this country for what it is worth, and sell it for the damage done to the crops beneath, and doubt not it would quite put Mr. Hudson in the shade, although he speculated by steam. I hope our good landed proprietors will pardon my speaking a little plainly on the subject; but I must say they are apt to carry their heads rather too high when riding over their estates, admiring the spreading oak, the elegant ash, and towering elm, instead of looking down at the wretched crops beneath, by which the hopes of the husbandmen are blighted, and the food of the people destroyed. The loss is great when trees stand on the border of one corn field, greater between two, but greater still when standing in them, not only from the nutriment being extracted by the roots, but the breakage of ploughs and inconvenient dodging which must follow in the working of every other implement. When living in Herts it twice fell to my lot to ride over the county as one of the judges of root crops, and on both occasions it was quite distressing to see the havoc caused by timber. I remember making this remark to my colleagues: Would it not be much more to the point, instead of the landlords giving a prize to the tenant for the best root crop, for the latter to offer one to those landlords who had the least number of trees in their corn fields? We measured the distance injured by one ash tree, and mentioned it in our report at the annual meeting. To the best of my recollection the damage extended twenty-five yards from the trunk. A friend, on hearing the topic for this evening's dis-

ussion, was kind enough to measure the damage caused by three trees on his farm during the last harvest, and found that one oak, girthing 68 inches, injured the crop from 13 to 14 yards from the trunk—probable age of tree from 160 to 180 years, value from 40s. to 50s.; one elm, age and value much the same, injuring crop 15 yards from the trunk; one small ash, value from 12s. to 15s., extent of damage about the same as the oak. The crop was barley, something like five qrs. to the acre, but not more than one-third of that under the trees; and thus by putting the value of damage at only 4s. per tree for one hundred years, and saying nothing of the first fifty or sixty, it would amount to £20, and the value of the trees not more than 50s., making a loss of £17 10s. for each tree. In concluding this part of the subject, and advocating the fall of trees which are a curse and not a blessing, God forbid that I should wish to see this beautiful world of ours stripped of all its splendour; but I would say to those who have the power, plant more of your hills and dales, heath and waste land by the road side, which are not calculated for growing corn. It is true it will be a work of time for them to make much progress, but pray begin and do what your forefathers ought to have done, in order that the now bleak and barren spots might smile with gratitude to the hand of industry. I will now proceed to make a few remarks on planting, narrowing, and rooting hedgerows. It appears to be generally agreed that white hush, or quick, is the best to procure a good live fence, but still opinions differ as to the manner of cultivation; some preferring double rows, other single. As far as my own experience goes I should decidedly recommend the latter, for this reason: it is quite out of the question to expect a strong and healthy fence, unless kept clean when young, which is practicable on the single system; but it is almost impossible to dig between a double row after a certain growth. Some approve of the plan of cutting it down close to the earth the first year, but it appears to me better to let it remain three or four years, and then, when cut close, it will shoot stronger and make a much more bushy fence below. Having made these observations on planting, I will now endeavour to bring a few facts to show the evil arising from having too many hedges, and consequently many small fields, which is a loss that even the occupiers are too apt to overlook. In the first place it must be admitted that sun and air are most essential not only to produce but also to ripen the corn; in most cases that growing within a few yards of the hedge is less productive and of an inferior quality. Then, when cultivating the land, there is a great loss of time, in turning, for both men and horses; and, in order to obtain some idea as to the amount, I have, on several occasions when two ploughs were going, and one some little distance behind the other, walked close beside the latter, and made a mark with my foot directly the first began to turn, and another as soon as it fairly got into its work again, and found the latter plough to have gone sometimes 7 perch, and never less than 4. So by taking the average at only 5 perch (which I fear is below, when the master's eye is not there), and thus by placing two square fields adjoining, each 10 acres, the hedge between must be 40 perch in length, there is a loss of 5 perch on both, making 10 in width. Consequently, while ploughing the 20 acres they will have lost sufficient time to have ploughed 2½ acres, if the hedges had not been there; and of course the same with drilling, harrowing, rolling, &c.; and supposing the

width taken up by the fence itself to be one perch, there is a loss of a quarter of an acre of grain or roots. I am aware it may be urged that in many cases it is necessary to have an open ditch to carry off the water: but, unless there is a very great quantity, it would be much cheaper in the end to put in large pipes and fill up the ditch, instead of having the mouths of the under-drains constantly stopped by rats and moles, &c., and perhaps cost less to run hurdles across when required, than to have the expense of cleaning and trimming the fence. With respect to those hedgerows which are indispensable, I would allude to the importance of keeping them as narrow as possible without injuring the fence, and also of cutting down all weed^s before they seed. It appears almost useless for the farmer to endeavour to clean his land while the hedgerows are complete nursery beds for all kinds of weeds, full of seeds for the wind and birds to scatter over the field. The thought has often occurred to me that it might be wise for the different farmers in the neighbourhood to have a sort of thistle rate; and, if scarce of hands, and there are any able-bodied men, women, or children in the Union, have them out, and supply them with the weapons of warfare most suitable for destroying that flying little enemy which grows upon the waste places, belonging, apparently to nobody, but which is, in fact, calculated to injure every one who holds an acre of land within a mile or so, according to the strength of the wind. Having briefly alluded to the advantages of rooting and narrowing live fences in order to gain time or land, and to destroy weeds, there yet remains, perhaps, the greatest reason why every farmer should be anxious to thin out his hedgerows—namely, that they may not form a harbour for the worst enemies with which the British agriculturist has to contend; I mean those midnight robbers called rats, rabbits, and hares; and in placing them amongst the etceteras, Mr. Chairman, I trust it will not be running from my subject to advocate their destruction also. But the tenant-farmers may say, "We cannot do it because the landlord claims them as his property, being on his estate." What, belong to the landlord? Yes, unless he sells the right of shooting to some stranger (which is not unfrequently the case). If that be true, gentlemen, would that England did not groan under such a curse. Let us endeavour to dissect a system so unjust. Should any of your pigs stray into a neighbour's field, although liable to pay a trifle for damages, you could still claim them as your own. But how is it with the rabbits and hares? We will suppose that there are two estates adjoining, one belongs to Lord A, the other to Squire B; and upon Lord A's estate there is a beautiful field of wheat. To whom does that belong? To Lord A? Oh no, but to poor old farmer Patient; and when I tell you he has not only paid his rent for the land, but has drained, manured, chalked, ploughed, and sown it, you must agree that surely every blade ought to belong to him. Ah! but look! do you not see that hare or rabbit in yonder farm. Whose is it? Well, watch it a little; and towards evening, when most robbers are on the alert, it goes to this wheat field, and begins cutting its paths and making hall rooms (or bald rooms) in the ripening corn; and, after satisfying its destructive appetite, it travels on a little farther, and gets pretty near to Squire B's estate. To whom does it belong? Lord A of course. Well, it goes a little farther, and happens to stop just upon the boundary line of the two estates; and now who owns this valuable animal? Why, I suppose, the head would belong to the squire, and my lord could only claim the tail. It takes another bound, and then may turn round to my lord and say, "Touch me if you dare." And yet this is the kind of property which has caused so many husbands and fathers to be transported to distant lands. Now I am not a friend to poaching, believing those to

be cowards who would sooner poach than work; but, of the two evils, I would rather stand before the Great Judge charged with the sin of poaching than that of game-preserving; for, whereas the one is guilty of stealing what really belongs to nobody knows who, the other is guilty of encouraging that which is robbing the poor man of his loaf. Some people may say, "But, surely, a landowner has a right to keep rabbits and hares on his estates if he likes?" But that is not what I have been complaining of; it is that poor Mr. Patient has to keep them and not the landlord. But I will venture still farther, and question whether it is right for a gentleman, even on his own occupation, to keep such destructive creatures, which, by being permitted to roam abroad, destroy tenfold their own value; for on this principle it might be argued he had a right, if he liked, to sow all his land with weeds for the purpose of collecting them into one large heap, and applying a lucifer match merely for the gratification of seeing them blaze, and hearing the crackling sound of a glorious bonfire. But, would it not be a sin in His sight, who has said, "Woe unto him who withholdeth corn from the people?" There are also other evils connected with this system; for the farmer not only has to keep the game, but help to prosecute the poachers and then support their families. I regret to say it is not unfrequently the case that a respectable and industrious farmer is constantly annoyed by seeing a conceited, unprincipled keeper sealing his hedges and travelling his field as though he had more right there than even the tenant himself, and worse still, giving false representations to his employer respecting the quantity of game. Of course, in making this remark, I do not condemn the whole of that class; yet, I fear the honest straightforward gamekeeper is the exception and not the rule, for the temptation is doubtless very great to endeavour to obtain a handsome gratuity from gentlemen after what is called a good day's sport. Perhaps it will not be out of place here to mention a case in point. When my father, with a large young family, was striving to gain an honest livelihood, he was much annoyed by game. On one season in particular several acres of turnips were eaten close down to the ground. Upon the keeper being informed of it, he merely replied, with a sneer, that "he would have them pecked up, that they might make a clean job of it." When this remark came to my father's ears, he, of course, informed his landlord of it, and the result was an order to have them killed down. But, alas! they did not make a clearance either, for I remember hearing him say, after he had occupied the same farm for forty years, he would be upon his oath, he believed the game had done him damage to the amount of £2,000, and he had no doubt, could it be ascertained, that it was double that sum. He thought it most probable that the poachers had had more of the game than came to the landlord's share, and that many were led on from that to fowl stealing, and from thence into the sheep fold. I trust you will not for a moment suppose that I look upon the landed proprietors as the most cruel, hard-hearted people on the face of the earth, and the tenant farmers as everything lovely. As far as disposition goes, no doubt there are six to one and half-a-dozen to the other, and I trust the good sort prevails in both classes. Had the present race of farmers been trained in the same school and possessed the same privileges as the aristocracy, they too might have overlooked these great evils. Neither am I one of these headstrong politicians who would strip off the carriage-wheels, and unglue the delicate hand of our nobility, and who consider it a hardship to raise the hat and pay honour to whom honour is due. Nevertheless, I cannot go upon the principle of "love me, love my dog;" for, much as I respect many of those noble and worthy gentlemen, I cannot love their de-

structive vermine, and would recommend them to try the English heart of the tenant farmer, by looking to him to supply them with field sport in the shape of winged game, and am much deceived if many would not return home with as little powder and shot and a much lighter heart than they have a right to do under the present system. But I cannot conclude without attaching a great portion of the blame to the tenant farmers themselves; for instead of attacking the system as a body, in a proper spirit, they are too apt to try and heal the wounds by grumbling to each other and truckling to the keepers, by treating them, &c., and frequently making ill-natured remarks about their landlord, when in many cases he is not aware that they are injured, and would be most unwilling to treat any one unfairly. With regard to the system of game preserving, I can, in most cases, condemn it as worse than highway robbery, on this ground—that one who goes out to rob, may meet a better man than himself; but when the farmer (after a promise that he should not be injured) buries his capital in the soil, and then loses a great portion of it by the game, he cannot defend himself. Finally, let me say to the tenant farmers of England, instead of sitting grumbling over your fire-places, and letting your expressions go up the chimney—where they only end in smoke—come to meetings like the present. speak your minds, and

Be ye like the old apostles,
Be ye like heroic Paul:
If a free thought seeks expression,
Speak it boldly—speak it all.

Face thine enemies—accusers;
Scorn the prison, rack, or rod;
And, if thou hast truth to utter,
Speak, and leave the rest to God.

Mr. Jackson resumed his seat amid general applause.

Mr. LILLINGTON spoke of his diffidence to see gentlemen deprived of a legitimate amount of sport, and asked Mr. Jackson if he could suggest how this might be secured, and the farmer, at the same time, have his crops secured from "vermin."

Mr. JACKSON replied, that with respect to the ground game, he recommended that they should be killed.

Mr. RANDALL considered that the planting of waste-land with timber was a very desirable thing, and would not injure any one; the only question being, whether they could get the trees to grow in some situations, especially on the coast. With respect to raising young fences, he was not at all an advocate for cutting off the thorns. He had tried it, but thought there was a better way to go about it—that was, to take care of the fence till five years old, and then lay them down and bind them, especially on high land, where what they wanted was a good high fence. The only thing was, that they had to protect the young plants for a year or two; but the consequence was, that they could get up the fence better than any other way. Mr. Jackson had alluded to the damage done by trees in a certain position. Now a somewhat singular fact had come to his knowledge. A gentleman purchased an estate in Somersetshire, and the son finding that great injury was done to the crops by some of the timber, was anxious to have the trees cut down. The old gentleman, however, refused to give his consent, and the son entered into a calculation of the damage done by an oak since the estate had been in their possession, which he brought to about £900. No doubt he went to the outside in his anxiety to have the tree removed; but the old gentleman was so far convinced that he allowed the tree to be cut down, and it sold for £80, while it had actually cost him about £900. If he could have

his own way he should like a farm laid out in fields of about five-and-twenty acres, when the hedge-rows instead of being a nuisance would be an advantage, as affording great shelter to the stock. He deprecated the system of gentlemen half protecting the game, which was worse than going to the other extreme, and stated that this had been the means of throwing fifteen children and three women upon his parish at this very time (Hear, hear.) If gentlemen would only give tenants the privilege to kill ground game, rabbits, and hares, he was quite satisfied that every man of principle would be happy to preserve pheasants, and give good sport for winged game. If these things could only be viewed in a proper light it would do away with heartburnings and animosity between landlord and tenant, and lead to a better understanding.

Mr. TAYLOR said his opinion was that timber should never be allowed to grow in the hedgerows between arable land. He considered that the poor thin wastes might be advantageously planted with firs, but oak and elm required a stronger soil. As to rabbits, he wished every one was destroyed.

Mr. CLARKE observed that Mr. Jackson in his able address had begun as a hewer of timber, a leveller of hedgerows, and a destroyer of game, and upon these three points he (Mr. Clarke) had very little to differ with him. He once went to attend a sale in the Isle of Purbeck, and he could not help admiring the magnificent view from the sale yard; but, happening to carry his eyes right and left of Knowle, he observed that there were as many hedgerows as acres of land. Now, he quite agreed that it was essential many of these hedgerows should be removed, but it was also necessary that there should be some shelter upon all farms. As to planting fences, a plan he had seen answer admirably was to plant the quick in the side of the bank. It was put in two rows, and allowed to grow for three years, and then cut close to the bank; and the fence made in this way was so thick at the bottom that it would puzzle an old hare to get through. He was no advocate for ground game, and believed that if the damage they did were properly represented to the landlords, they would act upon a different principle than they did. But the fact was that it was the stock-in-trade of the keepers to profit as much as they possibly could by it. It was only the other day he happened to read in the *Times* that his H.R.H. the Commander-in-Chief had had a day's shooting at the Duke of Rutland's, and the quantity of game killed seemed almost incredible. Where such a stock of game was kept it must be most destructive to the crops, and most vexatious to the man who sank his capital in the land for his own benefit and the benefit of mankind at large; and such a state of things should not be allowed to exist. He believed that if they were not to grumble quite so much, but represent the facts in the proper quarter, they would get more redress than they did under the present circumstances. Were every farmer to make a rough calculation of the damage he thus sustained from these obnoxious "vermin," he was sure it would amount to more than was conceived. With respect to timber, it was very desirable that they should grow it both for useful and ornamental purposes; but fields and hedgerows were not the proper place, and it was impossible for a man to keep up his fence if the banks were encumbered with trees scattered here and there. He did not think the waste lands could be better occupied than by planting Scotch firs.

Mr. FOWLER, in reference to the question where timber might be grown, said they could not do better than follow nature itself. Look at the oak, and consider where it grows best. In strong heavy land. An old map of the Isle of

Purbeck showed that there was once there a very extensive forest; and there were many acres of land in that place which might be better planted with oak than left in its present shameful state. The elm required richer land; and there were many places in Somersetshire where it might be grown much better than it was here. He did not agree in recommending Scotch firs, but the larch firs, which he was sorry not to see cultivated, instead of the inferior descriptions. As to planting young hedges, he had had some little experience; but he always found the best way was to plant a double row, keep them well weeded, and cut them the second year, keeping them well sheltered with a good "frith" fence, as they required to be screened from the strong south-west winds. After they had got up a good height he should recommend them to be laid, and after that not to let them get up, but keep them well trimmed to a point in the middle, as it was the drippings from the branches above that injured those below. With regard to game, he thought that if gentlemen were to place the confidence in their tenants they did in their keepers, they would have a greater amount of sport afforded them, without the enormous expense they now went to.

Mr. READER said he should be very happy to have better hedges upon the hills than they could get; but, at the same time, if a man had a wide double hedge, which harboured rats, rabbits, and everything that they detested, he had better remove it at once and plant a new one, rather than try to improve the old one, as he was convinced it would be less expense in the end. In planting a young thorn-hedge he thought they must be governed in some degree by the situation. It was useless to attempt to get a fence on their hills, if they planted the thorns upon the bank; more particularly upon an old bank. He preferred planting in a ditch, and, instead of clearing out, to keep filling up as the thorns grew. They could thus get a better hedge upon the hills than by planting on a bank. He quite agreed that there was nothing like fencing them well, and getting them up as quickly as possible. With respect to timber, he was not troubled with trees in his hedgerows, as they could hardly get one to grow on his hills; and, if it did, the south-west winds would shear it very close without his troubling about it. He believed there was a great deal of waste land in this county that could be planted with great advantage, not only to Scotch firs, but in some cases to oak. He noticed that some years ago Dr. Bain planted some oaks upon clay at Hefelton, and they had grown exceedingly well. Where the land was not so strong they might plant firs, mixed with larch, which he understood was for some purposes quite as useful when it got old. He was told that if they got a good fir, charred it, and put it in the ground upside-down, it would last as long as some oak; but if put in the same way as it grew, it would not last so long. If timber was grown more upon the waste lands it would be far preferable to having trees upon farms, especially on arable lands. He also advocated the destruction of all gorse upon land where it could be converted into anything like arable land, as it was a great harbour for rabbits and rats. With respect to rabbits, he had nothing to complain of, personally; but he knew an instance of two adjoining parishes, in one of which the game was protected by the tenant-farmer, and there was plenty of sport, while in the other, where it was not protected at all, there was scarcely a hare to be found, and very little winged game, as they were all taken by the poachers. Now, the difference in the charge to the county for the punishment of offenders, and to the union for keeping their wives and families, was more than 500 per cent. between those two parishes. He thought that, if all the evils of the present system could

be laid before the landed proprietors, they would at once see the necessity for some alteration.

The CHAIRMAN offered a few remarks in support of the great damage done by trees in the fields and hedgerows. He liked to see trees in the proper place, such as ornamental trees in a gentleman's park, but they should not be in the corn-field; for the damage done was far greater than the value of the timber, ten times over. He also commented on the inconvenience of the old double hedges, which were so crooked that men could not plough or drill properly, and stated that his plan was to remove them and plant young ones parallel to each other, so that the drill would come square. He did not agree with planting fences in a ditch, but found his to answer best upon two "clods" and a "turn-clod." A plan which he liked was to put a few black thorns among the white thorns, two or three in a lug. The latter did not stand many years, and as they went out the black thorns would run along and occupy their places. He liked to see gentlemen have a good day's sport; but it was the rabbits that the farmers of this county had to complain of, and, if they were destroyed, he believed there would be double the quantity of winged game.

Mr. JACKSON afterwards made a few observations in reply, commenting on the many points in which the members of the club agreed with him, and concluded by proposing the following resolution, which was unanimously adopted:

"That all timber required for the use of an estate should be grown in plantations, a large portion of which may be raised on waste lands; that hedges for the division of lands should be according to the size of the farms, say from 20 to 30 acre pieces generally, and are a necessary shelter for stock; and that they should be formed of quick thorn, and be as straight and narrow as possible to form a fence against stock, without being a harbour for rabbits, rats, &c., one of the greatest annoyances the farmer has to contend against."

The CHAIRMAN then proposed and Mr. LILLINGTON seconded a vote of thanks to Mr. Jackson for the very able manner in which he had treated the subject, and the same having been accorded with acclamation, the formal proceedings of the evening terminated.

THE FARMER.

A farmer sat in his easy chair,
Drawn out 'neath the maple's shade,
Gazing the while on the verdant lawn,
While his laughing children played.

'Twas the sunset hour, his work was done;
And now that his toil was o'er,
He was resting his wearied form, beneath
The old tree at the door.

His eye glanced o'er the spreading fields,
O'er the meadow's green and fair,
And his heart was filled with gratitude
That God had placed him here.

Kind hearts were in that happy home;
Sweet children, glad and gay,
Cheered the good farmer's heart, and drove
His every care away.

This was the home of happiness,
Joy's dear aiding place;
Contentment beamed in every glance,
Shone forth in every face.

Oh! give to me the farmer's life,
Its joys and pleasures too,
And I will leave the town, with all
Its bustling scenes, to you.

RECENT IMPROVEMENTS IN, AND PRESENT PROSPECTS OF, AGRICULTURE.

At the annual dinner of the Hexham Farmers' Club on Tuesday, Jan. 11, Mr. Grey, in proposing "Success to the Club," said: Gentlemen, as to the subject of discussion, I need not turn your eyes back to the time—the time gone by, happily for us—when the country which we occupy, and which is so richly studded with farm buildings and with full stack-yards, and so well cultivated, was almost a barren waste. I need not refer to the time when the countries on both sides of the border were the subjects of devastation from one side or the other; when the fruits of industry were far too precarious to allow of industrious habits among the people; when cattle were carried away and crops destroyed by an invading enemy from the other side; but I shall just turn back the thoughts of those who are old enough with myself to recollect what things were about the beginning of this century, and direct your attention to the great changes which have taken place, the change which the farmer could not be blamed for not having anticipated, because what would have been the use of increasing your produce to such an amazing extent as it has been increased, unless there were people to feed, mouths to be filled, and money to pay for it? But I would rescue the farmers from the imputation of slowness in this, because, the moment the impulse was given, the moment remuneration was shown, the moment it was seen we had a population to feed which could afford to buy their beef and mutton as they do now, the farmer put the spur to the wheel, and he has been found to produce that which is sufficient for them. You will recollect, I dare say, gentlemen, at the time I speak of, when it was the habit to allow young cattle and sheep to go in a very meagre way upon very poor pastures; and after they had attained an age when it was fancied they might be matured and brought to market, they were taken up and fattened. Now, gentlemen, that won't do in the present day. We had then a scanty fleece of wool every year from the sheep, and when the sheep got to be two or three years older they were fed. But what is the fact now? On high ground you see that they are taken a year sooner than they were at those times; on low ground you can hardly say that a sheep is allowed to go till he is two years old. We should consider that a perfect waste. Sheep are brought to market at fourteen or fifteen months old, and you are deriving from sheep of that age as much wool as you derived from sheep that had gone two years longer, and occupied your ground more unprofitably. In the same way it is with cattle; and the secret of raising the greatest amount of produce, whether in beef or mutton, I believe to be this, that you never ought to allow the animal to be so pinched or starved as that it retrogrades in the least. You should keep it progressing from the first month of its birth, and never let it lose the flesh it has acquired, because if you have an animal losing for one month, it takes another month to make it up, and then a month more to bring it into a regular healthy condition. The secret, then, I believe is, and it is now pretty well understood, that from their birth forward the animals ought to be brought forward to the condition which they are intended to be in, without ever losing one day. And thus you see the practice of some of my neighbours, of storing their turnips in the fields in heaps, so that the hardest frosts that come will not make the

sheep have a hungry day—they have always fresh food to go to. In this way it is, gentlemen, that we find we have it in our power to supply to a considerable degree the greatly increased consumption of the people; but yet we do not find that this is overdone, for when I talk, as I do at present, upon the head of stock, I would just turn your view to the different prices which beef and mutton have maintained for a long period, as compared with other articles of farming produce. When I first recollect farming, the common way for a man to select a portion of his fallow which was best suited for turnips. That portion got all the manure which was made upon the farm; it was not so much as might have been, I am sorry to say, because we recollect the quantities that were lost, as the stubble of the field, as compared with now-a-days, when the machine cuts it so close that my friends that are sportsmen complain that a partridge cannot find a hiding-place from one end of the farm to another upon a stubble-field. Well, that portion of fallow received the whole of the manure; what was left, perhaps, got a little scanty dose of lime, and then it was expected to grow a crop of wheat. We know what kind of crops were grown; we know that, as compared with now, there was not above two-thirds, or perhaps, in many cases, not one-half, of the produce of corn. There was not, certainly, nearly one-half of the produce of butchers' meat which there is at this moment. Then with regard to wool. Look at the prices which wool is maintaining, and the desirability there is for the cultivation of that kind of stock which not only gives you the carcase at the end, but gives you an annual produce of wool. It is said, and may be said truly with regard to some farms, that it is impossible that the farmer can thrive with the average price of wheat at 40s. and below it. I saw it stated in one of our periodical papers the other day that the farmer would be ruined by the price of wheat. So say I, if there are farms which have nothing else but wheat to depend upon. This is the case, certainly, on some small farms of cold land; but it will hardly be the case, as it might have been of beef and mutton were at 4d. a pound instead of 7d. and 8d., and half wool been at 18s. or 20s. the stone instead of 36s., as we have had it formerly, or instead of 42s. as it is now; for, gentlemen, it may be of some consequence for you to know, and some consolation to those who have much to sell, that I know of one person who has been offered for his next year's clip of between 200 and 300 stones 42s. a stone, to be paid within a fortnight of his clipping it. I think there is a lesson taught by that, when I have directed your attention to the low price ruling for wheat and other grain, though oats and barley are not so depressed; but when I have drawn your attention to the low price of wheat and to the high comparative price of butchers' meat, I think this lesson meets you—and that you will take it to yourselves—that there are countries more favourable as to soil and climate for the production of wheat than our own; that wheat is an article which can be transferred from one part of the world or one part of the country to another, and is of small bulk as compared with its value, but that no one can injure or come up to us either in beef or mutton, or in the growth of wool. We have pastures for summer feed: we have capabilities for rearing

root crops, as you all know, to make up the supply when the summer food fails; and we have the opportunity, if we have the judgment, the skill, and the liberality to do it, to raise beef and mutton beyond any other country on the face of the globe. It is very astonishing to look to the statistics of France and of this country, and to see the wonderful difference between the amount that is produced in butchers' meat here; and there is this to console you in the prospect of it, that there is now such a consumption of this description of food that it will hardly be outdone in this country. For my own part, I think it has ruled rather as much too high as what has ruled too low for some time past. Since I recollect, it was hardly the case that the labouring population of this country were able to indulge themselves with eating butchers' meat at home. The father of a family thought himself very well off if he could feed one or two pigs, and exceedingly well off if he could maintain a cow; but you now see the butcher's shop in every village, and you are often liable to be trotted over by the butcher's cart dispensing joints of meat at every cottage door as you go along the road. Such is the difference in the way of living, and I am sure you will all rejoice with me in thinking that it is so. Then, gentlemen, since these changes have taken place in the improvement and in the increase of the quantity of butchers' meat which we are now able to take from our farmers to market, has not a corresponding increase taken place in corn? because the very thing that creates one gives a stimulus to the other. You manure your lands that you may rear root crops, and you use guano, bone phosphates, and every kind of combination which can increase the quantity. The quantity increased in that respect goes again to increase the manure in your foldyard. You have had the wisdom to adopt a very different plan of reaping your corn and harvesting it from that which prevailed when I first knew this county. At that time you might have gone into the fields and into the stubbles, where it would have taken you almost up to the knees, and you would have seen a proportionate amount of heads of corn scattered among it, and which could not have been saved in that slovenly mode of harvesting. I am glad to see now that from one end of the Tyne to the other you hardly see a field which, as I said before, would give cover to a partridge. Therefore the quantity of manure is not only increased in your foldyards, but you increase it also by the purchase of those foreign and adventitious manures which have had so great an effect in producing your root crops, and those root crops produce to you what all of you who have had experience in farming know is so profitable—than is, butchers' meat and wool. I should like to say one word in the cause of sheep-stock. There is a friend of mine here to whom I have talked for the last 20 years on the subject, and I am happy to say I have no cause to change my opinion, and it is this—that the wealth and success of a farmer may be pretty well calculated by the amount of his sheep stock. Sheep are said to be the animals with the golden hoof, that they enrich where they go, and that is true. They not only enrich the master, but the soil. Their manure has a peculiarly efficacious quality, and it is distributed throughout the land in a way very different from that which is left in patches by horned cattle; but there is this also, that while you have the mutton, probably as valuable at the end of the sheep's life as beef, it has given you, year after year, the fleece, which is of itself so important, and which, in the progress of the manufacture of this country, I think we have no reason to fear ever again seeing at a very disastrous price. After enumerating the improvements which had taken place in agriculture for the last 20 years, he continued:—If, I say, you look at these advantages in the

present day, you cannot but with me congratulate yourselves upon having the benefit of all these improvements, and you cannot but with me conceive that that progress is not yet at an end. We have no reason to think that the ingenuity of man is exhausted, or that the chemical combinations which science has brought to bear upon the produce of the land are at an end. We need not fear yet, or halt in our progress. We need not look, I think, with any doubt upon the time that is to come. We still have old mother earth to work upon, who has shown herself always grateful for our efforts; and you may rely upon it, though I shall not live to see it, there will be yet days of great progress and of great prosperity for the agriculture of this country. I look upon the farmer as the manufacturer of the food of the people, and you may compare him with the manufacturer in any other way; and if you look to the ancient mode of thrashing and reaping corn—to the time when a man, from early morn till dewy eve, plied his labour upon a board in a barn, and with two sticks thumped out most imperfectly, first on one side of the sheaf and then on the other—if you look to that process, and compare it with the expeditious and much more perfect one of the thrashing machine, whether by water or steam, or by the still inferior one of horses, which many men are compelled to employ, you will see there is a wonderful difference, not only in the operation, but in the intellect which is required to conduct these operations. The manufacturer of the food of the people bears an analogy to manufacturers of other descriptions. Some of you may recollect the old village weaver driving his shuttle from morning to night with his single loom, and then finishing a web after three or four weeks' labour. That time, however agreeable or arcadian it might be to look back upon, was not a condition that ever had been a happy one, or ever would be a productive one. We saw the result of it a few years ago in Ireland, and wherever the thing is attempted we shall see the same result; and why is it so? Because it is impossible upon a small scale to introduce machinery of an expensive character; and why is it so? and there is nothing now but expensive machinery, improved operations in agriculture, and division of labour upon a tolerably extensive scale, which can produce any result that is desirable in a national point of view. The object of the nation is not to load the country with an immense peasantry, but to raise the greatest amount of produce by the smallest number of consumers, and to have the greatest possible disposable amount of food for the ever-increasing population of our towns and manufactories. If we contemplate the increase of the population in this country as 360,000 a-year, we shall see that, unless from wars or emigration, all the efforts we can use will fall far short of supplying them with food. It is on this ground that I think that you must have farms of considerable extent if you intend that the progress of agriculture should go on. It is consistent in theory that it should be so, because on a farm of considerable extent, where all the arrangements are regular, and the operations are conducted with skill and good management, you have skilled hands needful for each kind of work. If you go to the farm of a man who has eight or ten horses, you see as regular a system as in any other manufactory; you see ploughs sent to make the drill rows, you see carts putting manure into these rows, and followed by another set of ploughs covering that up, and then comes the sow drill to put in the seed, and before night 10 or 12 acres are sown and covered in the most promising way; but, on the other hand, the poor man on a small farm, with a pair of horses and a hind, how is he to succeed? He makes a few rows in the morning, he changes all the harness of his horses, and puts them into the

cart, and gets his wife and daughters, or whoever he can catch, to help him to put in a little manure, and then he changes his horses again from the cart to the plough, and perhaps by working an hour or two over, he gets it sown with turnips; but all the time it was exposed to a baking sun, and it might be that unfortunately rain came and he was laid off altogether for a week. If you compare the probable success and cheapness of management of the one with those of the other, you will find that all the hard work, all the poor hoeing, all the parsimony employed—and which is all a poor man has to employ upon a small farm—is not at all adequate to the system, the arrangement, and the skilful operations of larger establishments. I have had through my hands a good many farms of different descriptions, and for the last three years, when I have had a small farm of £100 a-year or less to let, I have been obliged to take the same rent, or perhaps less than before; but, when I have had a large farm of £500 a-year, I have been able to realize a great advance of rent; and, if I have had a farm of £1,000 or £1,200 a-year, then I have had 25 or 30 per cent. advance. I do not say I rejoice in this, but it forces itself on my observation. The only liking I have for a small farm is that it affords a kind of stepping-stone to the industrious labourer to advance himself in society. I have seen instances of this, and I have been very glad to encourage it; but, whether we look to individual interest or the national good, I must give my vote for farms of a considerable size, where there is abundant capital to employ all the improvements and

implements known, and to purchase all the manures found to be advantageous, and to make that division of labour which is so essential to the good working of a large establishment. Under all progress and improvement it is our bounden duty to try to cultivate the minds of our men as well as to cultivate our land. It will be unnecessary to turn your attention to the fact that it is most desirable that we should produce that which the country offers the greatest home market for, and that which will at the same time be most remunerative. I know there is a way of reckoning upon wheat as productive and remunerative; it has been fixed upon to guide the commutation of tithes and various other things, but it is proved to be a fallacious ground for computing the prosperity of a farmer. I have heard many people inveighing against the low market price of wheat at the present moment, and saying, "How can a farmer thrive?" But there is a fallacy in this, and many of you will hold me out in saying that, notwithstanding the very low prices, the crop of this year is remunerating you very much better than the crop of the two former years did. Therefore the actual price is not a fair criterion of the profit which the farmer is making. But, again, if you turn to the remunerating prices that the farmer is receiving for both beef and mutton, I need not recommend you to pursue the rearing of beef and mutton, but more especially the enlargement of your flocks of sheep to the utmost extent they are capable of receiving, because this I do believe is the great object we must look to hereafter as the staple commodity of our farms.

BATH AND WEST OF ENGLAND SOCIETY.

FOR THE ENCOURAGEMENT OF AGRICULTURE, ARTS, MANUFACTURES, AND COMMERCE.

An important meeting of the Council of this society was held on Saturday, Jan. 15, at Waghorn's Hotel, Taunton, and was attended by upwards of thirty members. There were present—John Sillifant, Esq., of Coombe, Crediton (President), in the chair, the Rt. Hon. Lord Courtney, Messrs. C. A. Moody, M.P., T. D. Acland, F. H. Dickinson, J. Tyrell, J. Daw, E. H. Drew, T. Hussey, J. H. Widdicombe, T. Danger, J. E. Knollys, C. Gordon, jun., J. H. Cotterell, R. G. Badcock, John Gray, H. G. Moyses, C. Bush, J. D. Hancock, D. Adair, T. B. Morle, H. G. Andrews, W. E. Gillett, R. Smith, G. Langdon, S. Pitman, G. Poole, Jonathan Gray, W. Thompson, R. May, M. Farrant, and W. Wippell.

ABOLITION OF THE IMPLEMENT PRIZE SYSTEM.—Mr. Gabriel Poole brought up the report of the committee, setting forth the regulations made in the implement department for the forthcoming exhibition at Barnstaple; and Mr. Poole then moved that the implement yard be open for exhibition on Monday and Tuesday, the 30th and 31st of May next; that both the implement and stock yards be open to the public on Wednesday, Thursday, and Friday of the exhibition week, and that the charge for entrance be 2s. 6d. on Monday, Tuesday, Wednesday, and Thursday, and 1s. on Friday. Agreed to. It was also resolved, "That the council in abandoning the system of prizes for implements beg to record their sincere thanks to the judges of implements for their valuable services, which have in past years conduced so much to the welfare and prosperity of the society, and that a copy of this resolution be sent to the judges." A communication from the Mayor of Barnstaple (R. Bremridge, Esq.) was read, inviting the members to a banquet during the exhibition in that town. Mr. Sillifant, the chairman, was deputed to thank his worship for his kind invitation, and to intimate that the council would avail themselves of it on the Wednesday of the show-week.

PROPOSED EXTENSION OF THE EXHIBITION TO ARTS AND MANUFACTURES.—Mr. Thomas Dyke Acland introduced this subject in the form of a "memorandum" for the

consideration of the council. This document, which was very lengthy, described the success which had each year attended the exhibitions since the meetings of the society became migratory, and stated that the agricultural implements exhibited increased in numbers from 400 in 1852 to 1,100 in 1857. What was still more important, the practical character of the implements had steadily improved, and the attendance of exhibitors from a distance had increased from 16 to above 40. The increasing number of visitors, including a large proportion of ladies, had led to the exhibition of many articles not directly agricultural, with a view to their advertisement and sale; and in order to facilitate the disposal of the products of local industry or talent, it was now proposed to extend the exhibition of 1859 to agricultural implements, viz., in the mechanical department, scientific department, domestic or economical department, and an artistic department, &c. The memorandum having been debated at some length, it was resolved: "That a committee be appointed to carry into effect the proposed extension of the Exhibition to Arts and Manufactures, with reference to the memorandum prepared by Mr. Acland; that the undermentioned gentlemen do form such committee, viz.: Messrs. Sillifant, Acland, Walrond, G. Poole, Grenville, Moyses, Pitman, R. N. Grenville, Jonathan Gray, J. Daw, J. Tyrell, and T. D. Newman; and that Exeter be the place of meeting." It was also ordered that three shall be a quorum, and that all acts of the committee be reported to the Council at its next meeting, for their sanction and approval. Several members of the council offered handsome donations towards a special fund for carrying out the extension of the Barnstaple Exhibition to Arts and Manufactures.

NEW MEMBERS.—The following new members were elected, viz.:—Mr. Josiah Goodwin, Gazette Office, Exeter; Mr. Robert Gibbs, Dunster, Somerset; Mr. W. E. Elliott, Plymouth; Mr. Davie, Creedy Park, Devon; Mr. J. W. Sillifant, Coombe, Coplestone, Devon; Mr. Landrey, Holne Cot, Ashburton, Devon; Mr. Edward Hockin, Bude, Cornwall; Mr. H. Harvey, Fenchurch-street, London.

STEAM CULTURE.

SIR,—In my last letter I referred to the meeting of the Society of Arts on Wednesday evening, 8th of December, at which Mr. Halkett read a paper on the principle of his system of "Guideway Steam Cultivation." And having paid considerable attention to the subject of steam culture in general, and to Mr. Halkett's plan in particular, I am induced to give you my thoughts upon it.

It has appeared to me for some time that the agriculturists generally, including the Royal Agricultural Society, have mistaken the capabilities and the mission of steam power, as applicable to the operations of the farm. They have started with one idea only in cultivation—namely, *ploughing*—to which they have adhered; and the Society has endorsed the error by offering and awarding their largest prize for the best mode of accomplishing it. I look upon this challenge of the Society as calculated to lead the machine-makers upon "a false scent," which has not, and cannot, lead to an economical result. I will explain what I mean by a reference to the manner in which steam power is applied in other departments of industry. If, for example, we go into the workshop of an engine or machine manufacturer, what do we see? If you look up you will see a shaft or spindle running from one end of the building to the other, connected at one end with the steam-engine, and furnished throughout its length with a numerous series of wheels, to which are applied straps connected below with machinery of every description used in the manufactory, such as lathes, polishers, grindstones, cutting-machines, &c., &c. All these may be carried on, either simultaneously or as they are required, without any change or modification of the motive power, or any interference of one operation with another. Such is also the case in all the great manufactories in which steam power has superseded hand labour. Every operation is performed by the same engine, which, with all the moving apparatus, is so arranged as that any one operation, or *all* simultaneously, may at any moment be put in action. And *this*, I maintain, is the mission of steam power in agriculture as well as every other kind of industry.

Now, the specific challenge of the Royal Agricultural Society is the production of a machine for *steam ploughing only*; and I do not hesitate to affirm that it is impossible, from the very nature of steam power, for that operation to be performed economically, or with complete efficiency, upon any of the systems hitherto produced, unless it is Mr. Halkett's: to which I now beg to direct the attention of your readers, confining myself to facts, and leaving them (the readers) to judge how far it is capable of fulfilling the mission which steam power is destined, as I firmly believe, to accomplish in the cultivation of the soil.

Let me not, however, be misunderstood. In adhering strictly to the terms fixed by the Royal Agricultural Society, the three principal competitors—Messrs. Boy-

dell, Fowler, and Smith—have severally displayed great ingenuity, and probably, so far as the object in view is concerned, have applied the power of steam in the only methods in which it can be applied to a single and isolated operation, unconnected with any other mechanical aid. In this respect, perhaps, Boydell's system would be the most complete, were it not for its elephantine proportions, which bear so heavily upon the land; otherwise, with some alterations and improvements, especially in the mode of draught, it might be made applicable to the purpose, but certainly not economically so. For conveying heavy goods on common roads, in countries where there are no railroads, it is admirably adapted; and the facility with which it rises an incline of one in five is a quality that distinguishes it from its competitors, and renders it of great importance to governmental establishments, and will insure it that kind of patronage. Messrs. Fowler and Smith's systems are similar to each other in all respects, I believe, except that the former works with a plough, and the latter with grubbers. And here I conceive the Royal Agricultural Society has committed an injustice by the strictness of their terms, to the letter of which they felt themselves bound to adhere. Mr. Smith's was certainly the original one, and I suppose was as capable of working with ploughs as Fowler's. But because he adopted the grubbers, as more efficient with the same power, and *cheaper* than ploughs, he was deprived of his claim to the prize. Being both, however, adapted only to the performance of one operation, and not being economically superior to the common plough, they do not come up to my ideas of the important mission of steam-power. In addition to this, it must be confessed that they are a round-about method of accomplishing a simple operation; and the enormous friction upon the ropes used for the traction will always render it an expensive process. I therefore say, without any limitation or reserve, that neither of the three systems illustrates in a manner worthy of the public patronage the capabilities of steam-power, and what I consider to be its undoubted future mission in the cultivation of the soil. It remains, therefore, for me to describe Mr. Halkett's system, and to show how far it is calculated to accomplish that mission by effecting an economical, beneficial, and, above all, entire performance of the whole round of operations of husbandry, from the ploughing of the land to the housing of the crop.

The "guideway" system consists, in the first place, in laying down the land with a series of permanent rails—in the same manner as on a common railway, only at the distance of from 30 to 50 (or more) feet from each other. Secondly, a machine or platform of strong timber, reaching across the intervening space between the rails, rests upon them on eight wheels, and is propelled forward by steam-engines, one being placed at

each end of the frame work directly over the wheels. Thirdly, to the lower part of this platform are attached the implements of husbandry of every kind, as they are severally required for the cultivation of the soil, such as ploughing, subsoiling, grubbing, scarifying, harrowing, rolling, drilling, dibbling, hoeing, hand-weeding, watering, distributing liquid manure, mowing, reaping, &c., all of which it professes to perform in the most exact and efficient manner. Any one who understands the inevitable precision which a railway gives to the movement of whatever machine or carriage is propelled upon it, will be able to judge for himself how far a plough or any other implement of husbandry, when fixed to the platform, will realize this important exactness. The fact is, when once fixed, the plough or other implement may break, but it cannot otherwise deviate from the line marked out by its connection with the rails on each side. This is correct in the case of all the implements of culture; and Mr. Halkett can hoe within *half-an-inch* of a row of plants without touching them. Fourthly, boxes or carriages are placed, when required, upon the framework of the machine, for the conveyance of manure, marl, clay, &c., on to the land; and for carting the produce, whether roots or corn, off it to the homestead, or wherever it is required to stack them. I ought to state, that at the headland are placed rails, at right angles with the others, and on these is a carriage placed on a level with them, so that on arriving at the headland, the framework runs at once upon this carriage, and is, by it, shunted to the next line of rails; or it may be taken to another field, or home to the farmyard, by means of rails laid down for that purpose. The whole of the operations are performed without the foot of man or beast, or the weight of any part of the apparatus employed, pressing upon the soil, which is left by them in a state of tilth equal to that of a market garden.

I feel that I have given in the above sketch a very inadequate description of the Guideway system; but such as it is, it will convey to the minds of your readers a tolerable idea of the way in which Mr. Halkett professes to cultivate the land. It is impossible in the compass of a letter to enumerate all the advantages held out by the patentee; nor can any description give so good and clear an idea of its working as a visit to Mr. Halkett's establishments, either at Wandsworth or Kensington, where it may be seen in operation at any time. Many gentlemen, both scientific and agricultural, have visited them; and it is due to Mr. Halkett to state that some who went thither strongly prejudiced against the system were fully convinced before they came away of its entire practicability and economic character.

I shall next consider the pecuniary part of the question, which was the chief objection urged against the system at the meeting on Wednesday evening. First, as to the rails. Mr. Halkett states that he is ready to lay down a farm with rails, at 50 feet intervals, if of wood *creosoted* at £10, and if of iron at £20 per acre. This certainly appears at first sight to be a heavy outlay, and to a tenant farmer, unless under a long lease or tenant-right covenants, an insuperable objection to the

system. On this account it was looked upon, by those present, rather as a landlord's than a tenant's question. This, however, does not affect the ultimate result to both landlord and tenant in regard to the profitableness of the system; and when the large saving in the cost of cultivation and in the increase of crops is taken into account, the objection will appear less formidable, especially in a country in which, in a very few years, £400,000,000 sterling have been expended in effecting an entire change in the locomotive habits of the people, by which they can now travel at four times the speed, and at one-third the expense they formerly did. In drainage too, from £10 to £15 per acre is fearlessly expended by tenant farmers at the commencement of a 21 years' lease, at the end of which he estimates that it will have paid him double that outlay; or if the landlord has drained, the tenant has no objection to paying him an additional rent adequate to the repayment of the principal in the period of the lease. I could instance many similar cases, in which a large outlay of capital on apparently inadequate objects has proved profitable to all parties concerned. The fact is, the farmer must in future come to look upon the farm as a manufactory, or at least with the eye of a manufacturer, and its various operations as capable of being conducted upon mechanical and economic principles as a cotton or any other textile manufactory. Enlarged ideas require to be disseminated amongst both landlords and tenants on this subject. They must learn that *frugality* is not economy, but that the more money is judiciously expended on the land the greater will be the produce and profit. I have long been convinced that when the farmers of England become fully indoctrinated with really economic principles, and carry them out in their practice, no foreign nation will be able to compete with them in the price of corn, any more than they now can in that of cotton, woollen, and silk fabrics. Many of your readers will think me "a fast young man" in these matters; but I assure them I am what I have always styled myself, an "Old Norfolk Farmer," who for nearly three-quarters of a century has watched the progress of agriculture, and witnessed changes which are fast tending to the result I have here foreshadowed. But I must beg pardon for this digression, and return to Mr. Halkett. The following are the items of his balance-sheet, showing the economic difference between the present, and his, system of culture.

Suppose a tenant hires 1,000 acres of land on a lease of 21 years, to be laid down with wood rails, at £10 per acre. Whether the landlord expends the money or the tenant, the interest on capital and depreciation in its value is estimated at 10 per cent., which is £1,000 per annum, or £21,000 for the whole term. If we reckon the simple interest at 4 per cent., it gives £400 per year, or an aggregate of £8,400 for the whole term, leaving £12,600 for repairs and depreciation.

With respect to the machinery and implements required for the new system, Mr. Halkett sets them against the present outlay for horses, waggons, carts, ploughs, &c., &c., which he considers amount to fully

as much. The balance-sheet is therefore thus drawn up :—

Capital required for stock, £2,500.		
Locomotive cultivator, with 25-horse power engines and shunting machinery complete, £1900, and implements £300, at 15 per cent.	330	0 0
10 trucks, £300, at 8 per cent.	24	0 0
Coal at 20s. per day, 250 days.	250	0 0
Engine-driver 4s., man 2s. 6d., boy 1s. per day: 313 days	117	0 0
Five constant labourers.	155	0 0
Labourers for hand-work on the crops.	50	0 0
	926	0
Interest and depreciation of rails.	1000	0 0
	£1926	0 0

Statement for a farm of 200 acres of well-tilled land, given by a valuator, and confirmed by a farmer :—

Capital for eight horses, four ploughs, harrows, &c., £500, at 15 per cent. for interest and depreciation	75	0 0
Horse keep	245	0 0
Four carters, at 12s. per week. £124 16 0		
One horse-keeper extra.	31	4 0
Three labourers	105	6 0
	261	6 0
100 acres of coru-hoeing, 4s. per acre.	20	0 0
Cutting 50 acres of corn, 8s. per acre.	20	0 0
	£621	6 0
Multiplied by 5, for 1000 acres	5	
	£3106	10 0
Deduct £50 for saving on machinery on a large farm over a small one	50	0 0
Farmers' present field expenses.	£3056	10 0
Cultivation by steam.	1926	0 0
Difference in favour of steam	£1,130	10 0

This is equal to 11 per cent. upon capital for rails ; and, when added to 4 per cent. already allowed, gives a profit of 15 per cent.

The above is the economic working of the system ; but this does not comprehend all, or the greatest source of profit. Mr. Halkett calculates that by the superior cultivation of the land and the absence of all unnecessary pressure on the soil ; by the facility of watering, irrigation, and continual stirring of the earth, a much larger produce will be obtained, especially with deep culture and the distribution of liquid-manure. A vast number of advantages are gained by the adoption of this system, as set forth by the patentee, which will all tend to increase the produce, and which he sums up in the following terms : " I have ploughed, subsoiled, harrowed, rolled, used the clod-crusher, the Norwegian

harrow, drilled seed dry and with liquid manure, hoed the crops, used the scarifier, reaped corn, carried crops, carried water, watered crops over the surface of the ground and plants, and watered upon rows of young plants or seed (to economise water or liquid-manure), drilled seed between rows of standing plants, and performed the new operations of the comminutor, weed-root extractor, and artificial-manure distributor, underground watering between rows of standing plants, and ploughing by night. The following hand-operations are also performed with much greater facility to the labourer, economy of time and cost, and greater regularity than can have hitherto been performed, namely, dibbling seed, transplanting, hand-weeding, cross hoeing, and taking off crops, &c., without in any case treading on the ground or spoiling rows of growing plants interlined between other rows."

One great advantage this system will have, perhaps its greatest, over every other yet invented, is the power of concentrating the operations upon a given time or space. Horses will tire, but a machine never ; and by a relay of men, Halkett's system may be worked upon as well and with as much precision and effect in the darkest night as at noon-day ; so that a farmer can avail himself of a favourable time to get in his seed or plough his land ; whilst, on the other hand, no weather, except *hard frost*, need stop the operations of the guide-way cultivator, the entire absence of pressure by the foot of man or beast rendering the state of the land of no consequence to the operations of the plough.

In conclusion, I beg to say that the above account is taken from Mr. Halkett's paper, which has been endorsed by the opinions of some of our most scientific as well as practical men ; amongst whom I find Professor Wilson, of Edinburgh, Mr. C. Wren Hoskyns, Mr. Alderman Mechi, Mr. Edwin Chadwick, Mr. Robert Scott Burn, and many others. And last, though not least, Mr. Smith, the patentee of the steam cultivator, has offered to give £50, if other gentlemen will subscribe an adequate sum, to test Mr. Halkett's system by laying down a farm on his principle.

I now leave your readers to judge of the merits of the plan. But, whatever may be their opinion on that head, Mr. H. has assuredly the merit of having been the first to comprehend, and adopt the true and full mission of steam power in the cultivation of the soil, and, still further, of having brought his system to a practical bearing.

Yours, &c.,

AN OLD NORFOLK FARMER.

London, Dec. 14.

THE CROSS-BREEDING OF SHEEP.—COTSWOLD AND OXFORDSHIRE DOWNS.

At the last meeting of the Botley and South Hants Farmers' Club, Mr. JOHN TWYNAM, of Winchester, delivered a lecture on "The Cross-breeding of Sheep." He commenced by stating that the experience of late years had fully proved that the sheet-anchor of the cultivator of the soil was the green-crop system—crops to be converted into

manure by the depasturing of cattle alternately between those and pulse. That the next important consideration which presented itself was the best mode of converting them, and the animals the most fitted to accomplish it ; and that, in reference to at least three-fourths of the arable land of this kingdom, the sheep stood forth as the most prominent

indispensable agent for that purpose. The lecturer then entered into the history of the modern sheep, and to the varieties which experience had proved to be the best adapted for the requirements of the present day, namely, the Southdown, the Leicester, the Cotswold, and the Hampshire Downs. Amongst the finer qualities, the Southdown held the foremost rank where the taste of the epicure is to be consulted, old mutton required, parks to be fed; or on arable lands of a dry subsoil, in a warm locality, these sheep might graze with as great advantage as any other. They would also do well long distances without injury, making a close bite on short herbage, but in the winter season were not so good proof against our fickle climate in exposed situations. The Leicester, for grazing purposes, on rich pastures, where no folding was required, the temperature warm, and weight of carcass, with early maturity in view, were perhaps to be preferred to all others, especially when they remembered that this breed had partaken, with other breeds, of the improvements of the day; for they no longer found them as in the days of Bakewell, beautiful indeed in symmetry and high in blood, but too often like so many rolling tallow-tubs, fit more for the chandler's than the butcher's shop, and partly covered with two-thirds of its present weight. There was now a better intermixture of muscle or lean meat with fat, by which the quality of the mutton was much improved, and the fleece was a third heavier, without having suffered any deterioration in quality. The Cotswolds, in former days, were of a large, yet rather coarse-grained carcass, with a heavy fleece of wool, possessing a good proportion of lean, more hardy than the Leicester, by judicious crossing with which they have been much improved, arriving much earlier at maturity, yielding a fleece of finer quality, scarcely diminished in weight, and adapted to the same purposes to which the Leicesters alone had hitherto been devoted, with the additional advantage of retaining with the cross their original hardier nature. The produce of the cross is styled the "improved Cotswold," bred chiefly in the counties of Oxford and Gloucester, from the hills of which latter county they derive their name. Acclimated on this elevated part of the kingdom, and feeding on pasture far inferior to the rich herbage on which the Leicesters are in the habit of grazing, it is to be expected that they would be characterized by a disposition to improve when removed into former soils and fuller keep. I have known them wintered on the arable soils of Hampshire in the open air, with hay and turnips, only become superfluously fat; while other breeds, fed on the same food, side by side, have barely sustained themselves in store condition. In describing the character of the Hampshire Down, which also prevails over a great part of Wiltshire, we must bear this point continually in mind. These counties, from their open fields and system of 'arming, are peculiarly adapted for store or breeding of ewes, and a rearing of such a description of lamb as will suit the feeders who come to their great fairs in the summer for the purpose of purchasing, with the view of bringing them out the following spring as well-fattened mutton for the London market. The aim, therefore, of the Hampshire and Wiltshire breeds is to combine size, quality, aptitude to arrive at early maturity, and a heavy fleece of good quality, with a constitution sufficiently hardy to undergo the process of consuming the green crops and folding on the ground where they go, thereby leaving a full dressing for the crop of corn which is to follow. Now, it will be at once apparent that the task of forming, as it were, an animal in which shall be combined the necessary qualities for these

several purposes, requires the soundest judgment and constant care, and is attended with many difficulties. The better points of different breeds require to be fused into one mould; and this daring exploit—for daring it was declared to be by a public bigoted to old customs, and prejudiced against the smallest deviation from the beaten track of their ancestors—has been made with signal success by many of the more enlightened flockmasters of these counties. They saw population had so gained on the heels of production, that a greater weight of meat was annually required to be grown; that, simultaneously with increase of number of sheep, they bethought themselves that to improve the symmetry, increase the aptitude to fatten, and arrive at heavier weights, with the same food, might be quite as economical a mode of supplying the increased demand, as to effect it solely by the increase of numbers. They had before their eyes the parent-breeds of the matchless Southdowns, Leicesters, and improved Cotswolds. These, in their separate state, were unfitted for the system of arable-land farming, as well as for the description of carcass which has the "call" in the market at the present day. To meet the requirements of both, an amalgamation was decided on; and the result was a carcass of mutton exhibiting the early maturity of the Leicester, the muscle of rich lean of the Cotswold, and the superior grain of the Down—a carcass "ripe" at fourteen months old, instead of at three or four years, as formerly. From this admixture, assisted by the original Hampshire breed, which was founded about the beginning of the present century, on (the then prevailing breed of the country) the old horn-ewe and Sussex ram, the present new Hampshire breed was formed. No long pedigree of what is called "purity of blood" can be claimed by any Hampshire flockmaster: but he has the satisfaction of knowing that it is the admixture he has made which constitutes the value of his stock; for neither of the parent-breeds from which he derived it can claim comparison with his own for the union of qualities necessary to form the most useful and best-adapted sheep for the profitable consumption of his green crops, or so satisfactorily to meet the demand of the consumers of mutton or of wool (Hear, hear).

Mr. BLUNDELL had noticed, in going through the Royal Agricultural Society's show, that a class of sheep increasing in favour very much indeed was the Oxfordshire Down, which were something like what had been recommended by the lecturer to-day; and they had assumed such a decided character, that they might be styled a distinct class of sheep; and they had received the cognomen of the "Oxfordshire Downs." This was important for all of them to know, so that they might be induced to purchase them.

Mr. SPOONER remarked that the shorthorned breed of cattle, and new Oxfordshire and improved breed of sheep, were familiar examples of the benefits of judicious crossing.

Mr. JAMES WARNER bore his testimony to the advantage of a cross in sheep. He had had crosses from sheep of all sorts; but he thought that the lecture of Mr. Twynan would elucidate some improvements. Those sheep which he bought crossed with the Cotswold thrived better, and paid him more, than any other.

Mr. TWYNAM, in reply, said that the Hampshire and the Cotswold would be far better than the Shropshire. With regard to the Oxfordshire cross, the greatest breeders of them were the Messrs. Druce, Mr. Hitchman, and another gentleman, whose name he did not recollect, who came to his house in 1836, took home some of his Hamp-

shire Down sheep, found it worth while to pay attention to the cross, and, having persevered, had brought them to perfection. They would acquire an advantage, if they purchased a new ram; and they would have one-fourth more twins than if they had kept exclusively to their own stock.

Mr. J. BLUNDELL proposed, in order to reduce their discussion to a practical result, "That this meeting is of

opinion that careful and judicious cross of sheep offers to both the breeders and graziers the best prospect of profit, and, at the same time, the best supply of mutton to our consuming population, and an increased supply of wool to the manufacturing community."

Mr. J. TWYNAM seconded the proposition, which was unanimously carried.

THE IMPORTS OF AGRICULTURAL PRODUCE.

A remarkable improvement has recently been made in the annual statement from the Board of Trade, which is deserving of special notice. Hitherto we have had no official data of the special imports into London, except what might be gleaned from the brokers' circulars and the records in the commercial journals. The last-published annual return, that which supplies the figures for 1857, besides giving the total imports for the United Kingdom, also specifies the separate imports of the leading and staple articles into the several ports. Hence we are able to draw some comparisons and deductions which may be found useful to our readers. The statistics, we may again observe, apply to last year (1857).

Commencing, then, with living animals, we find that the bulk of the live stock we import—and these are not very extensive—come to London. Out of 65,648 cattle imported, 41,635 came to London; and of 177,207 sheep, 161,543 were for the Metropolis.

Of the cured provisions and foreign dairy produce the direct imports into London are considerable, as may be seen by the following figures :

	Kingdom.	London.
Bacon and hams, cwts.	366,934	107,916
Beef, salted, ,,	150,940	69,369
Pork, ,, ,,	88,732	58,812
Lard, ,, ,,	182,860	16,549

Liverpool receives the chief quantities of direct imports of American provisions, but large quantities find their way to London on arrival.

Of butter we received in London 337,147 cwt. out of 441,606 cwt., the total imports. Of cheese 180,496 cwt. out of 393,323 cwt.; of eggs, 215,270 out of 634,093 cubic feet. The total number of eggs was upwards of 127,000,000.

Of foreign grain the aggregate imports into London were 2,618,243 quarters, out of a total import of 6,847,726 quarters; and of pulse 95,255 quarters, out of 465,674 quarters, the total at all the ports. The specific quantities of each was as follows :

	Kingdom.	London.
Wheat, qrs.	3,437,957	630,878
Barley, ,,	1,701,470	568,851
Oats, ,,	1,710,299	1,418,514
Peas, ,,	159,899	32,779
Beans, ,,	305,775	62,476

The imports of Indian corn and flour from America are chiefly at Liverpool and Irish ports. Out of 1,150,783 qrs. of maize, but 31,664 came to London; and of 2,178,148 cwts. of flour and wheatmeal, only 456,779 cwts. were received here.

The imports of rice are pretty equally divided between London and Liverpool; for 1,680,739 cwts. came to London, and 1,734,449 to Liverpool.

Of agricultural seeds much the largest proportion out of the entire imports come to London. Thus 82,843 cwts., or about half the cloverseed, arrived in London; 235,976 qrs. out of 1,051,113 qrs. of flax and linseed, and 110,459 out of 220,495 qrs. of rape-seed.

The bones for manure, &c., come chiefly to Hull, Liverpool, and London, and in pretty equal quantities. Out of a total import of 63,951 tons, 9,384 tons came to London. Guano, another chief fertilizer, is chiefly imported into the Thames: out of 288,362 tons total, 182,096 were for London. Nearly half the oilseed-cake, 46,212 out of 99,265 tons, was received in London.

Taking now a glance at some of the chief raw materials of commerce, we find that out of 966,212 cwts. of raw hides 517,056 cwts. were imported to London; and of tanned hides in the same proportion—3,000,000 out of 5,664,000 lbs. Out of 1,210,347 cwts. of tallow received from abroad, 814,750 cwts. came direct to London.

Liverpool is fast equalling London in its direct imports of wool. It has always had the monopoly of the import of the South American sheep and alpaca wools, but of late it has been drawing to the Mersey a large share of the Australian wools. Much of the wool is, however, sent to London, to be disposed of at the metropolitan wool sales. The total imports of sheep's and lambs' wool into the United Kingdom last year were 127,390,885 lbs.; of which 69,961,286 lbs. came to London direct, and 41,247,359 lbs. to Liverpool; while of the total alpaca wool (2,359,013 lbs.) 2,126,686 lbs. went to Liverpool, and but 133,903 lbs. came to London.

Timber, another large and important article of import, is chiefly divided between these two great ports, although London has the preponderance. The total quantity received from foreign countries and our colonies last year was 2,494,964 loads, in the log and split; and the proportions in each port were as follows :

	London.	Liverpool.
In logs loads	204,027	187,564
Sawn or split ,,	391,175	223,177
Staves ,,	49,508	21,823
	644,710	412,564

These are the principal articles of import. We

have merely selected those specially interesting to the agriculturist, in order to place at his command, for reference, facts and figures which may have an important bearing upon his dealings. The comparison in minor articles of import would have carried us too

much into detail. We may observe, in conclusion, that the farmers of Scotland imported last year 24,006 tons of guano, and 18,663 tons of bones—an evidence that they are not neglecting the improvement of their soil.

REARING OF CATTLE.

In Great Britain, where animal food enters so very largely into the general consumption of the inhabitants, no part of the economy of farming demands a more earnest attention than the rearing and fattening of the animals that are used for that purpose. A detailed statement of the most approved mode of managing cattle may not be unserviceable.

The calving season commences in January, and continues till June, the earliest dropped calves being always the best, and maintaining a superiority throughout the season. So soon as it is dropped, the calf is rubbed dry by straw in hand; an egg is crushed and passed down its throat, and it is carried to a single apartment, in which it lies undisturbed for some hours. In the mean time, the teats of the cow are stripped by the fingers of the hand, in order to discharge the first milk, which is reckoned to be unwholesome. The calf is then introduced and sucks a moderate quantity, and is again returned to its apartment. The sucking is performed thrice a-day: at six o'clock in the morning, at noon, and at six in the evening. The cow-house and the calf-pens are adjoining, and afford convenience by that position. The calf is led by a rope or halter on the head, and when it is sucking, the end of the rope slung longitudinally for that purpose behind the cow. Two calves suck one cow, and are placed one on each side.

So soon as the calf is able to chew with its mouth and to masticate, bruised oil-cake is placed in a box in a corner of the apartment, which food the animal very soon learns to chew, and it has a very nourishing effect. Another box contains a lump of chalk, which the animal licks, and it is found to be very useful in correcting the crude acidities of the stomach. A rack is placed on the sub-division of the apartments, and in it are placed clover and vetches, which the animal soon learns to eat. One rack thus serves two calves.

The calf continues to be fed and sucked in this manner for three months at least, when it will be grown strong and fit to be removed to an adjoining grass-paddock, which must be rich in pasture, well sheltered, and provided with a regular and ample supply of fresh-water, and a roomy shelter-shed. An orchard suits well for this purpose, the shade of the trees is grateful and the grass is tender for the young animals under the shade of the trees. At the end of sixteen weeks the milk is gradually withdrawn, and if the grass in the paddock be scanty, cut clovers and vetches must be given daily in racks, and in a fresh state. The shelter-shed must be well-littered and kept dry.

Sucking the dam is very much preferable to giving the milk to the calves by hand from the pail; for by

exposure the volatile gases of the milk escape; and in the process of sucking a quantity of saliva is engendered, which is necessary for the proper digestion of the milk, and for the secretion of nutritious juices. The appearance of the animal at once shows the great difference of the two ways of rearing; the suckled calf being ever sleek in the coat, light in the offal, and of a thriving and animated appearance. The animal that is fed by hand is heavier in the paunch, slower in growth, and of a generally more unthrifty appearance.

By the month of July the earliest calves will be able to be removed from the weaning paddock to the pasture field, which must be rich and well sheltered and watered. They remain there till the end of October, when they are removed to the farm-yards, where they are put into yards provided with shelter-yards, and about six or eight animals in each yard, into which fresh straw is put daily, and the feeding crib is frequently moved from place to place in order that the dung may be equally made, and get the same trampling and consolidation in every part of the yard. Fresh tops of turnips are given them to eat daily; and in the early winter the tops of mangel wurzel are added. The smallest sized turnips go with the tops, and form the food of the animals during the first winter, when the teeth are weak and the mouth is delicate.

In the first part of the month of May the grass is most generally sufficiently grown to afford a bite to pasturing animals, and at that time the young cattle, now about one year old, are removed to the pasture-fields, which must be well fenced and provided with a shelter-shed and an ample and constant supply of fresh-water. The gates and fences must be made very secure and impenetrable, that no damage may happen to the cattle in trying to escape by leaping the fences, or effecting a passage in any way. The shelter-shed, large and roomy, is an indispensable requisite for the purpose of protecting the animals against the scorching heats of noon-day and the cold storms of wind and rain that occur in autumn and in the early part of winter. No part of pasturing economy is more necessary.

About the end of the month of October the declension of the herbage and the increasing inclemency of the season render it necessary to house cattle, and they are removed from the fields to the farm-yards, and there arranged for the winter in smaller lots than during the last winter, as the size of the animals has increased: six or eight beasts are sufficient in one yard. Fresh straw is given them daily in a wooden crib, latticed in the sides and bottom, and frequently moved from place to place. The mouths of the animals being now strong

the bulbs of the turnips are given to them to eat, the tops and roots being cut off before they are removed from the field where they have grown. This operation is performed by a sharp sickle in the hands of persons employed for the purpose. Longitudinal cribs, made of latticed planks of wood, are placed in the yards, in which the turnips are laid every morning by break of day, and where the cattle eat them undisturbed. The mud and filth are very carefully removed by the shovel every morning before the fresh turnips are deposited. The eating of the roots is finished by the time when darkness sets in, which prevents any accidents happening to the animals, from choking or hoving, during the night. The water is supplied to each yard in cast-iron troughs, which are fed by pipes, with ball-cocks, leading from higher ground, or from elevated casks, to which the water is raised by a force-pump. One trough of five or six feet in length supplies two yards, by being placed across the subdivision walls. The troughs require to be cleansed out occasionally, in order to remove the earthy sediment that falls to the bottom. This purpose is effected by a plug-hole in the end of the trough, by which the watery sediment escapes, to which it is driven by a brush in the hand, and assisted by the trough being placed with a gentle inclination to the end which contains the plug-hole. The troughs are most convenient when the sides are shelving.

The young cattle are treated yearly in the manner above described, till the third winter, when the animals will be three years and a half old; and then the fattening process commences. The animals are arranged by the 1st of November in the feeding-yards, in lots of two, and not more than four together; it being a universal rule that, the smaller the number of animals that feed together, the better they thrive. Accordingly, many most eminent writers have recommended, and many very eminent practitioners have adopted, the mode of confining the animal "singly;" but the most general practice is, two or four together. The yards must be dry, have a good shelter-shed, and a regular supply of water. Cattle eating turnips *ad libitum* do not drink much water; but it is better that they have the liberty of taking or refusing it. In these yards the cattle are supplied daily with fresh turnips, and in quantity as many as they can consume, so as not to leave any part to be wasted or reduced to a loss. Fresh straw and hay are given daily in the cribs. In the spring, in February and March, one feed of oilcake is given daily, which hastens the process of fattening, and improves the quality of the dung, by enriching the excrements of the animal. The space of three months may be stated, at a general calculation, as the time required to render an animal that is treated in the above manner fat or fit to be slaughtered. But very much, if not all, depends on the grazing state of the animal; for, if it comes from the pasture-field to the feeding-yard in a "lean" state, double the above-mentioned time will be required to bring the animal into even a medium state of maturity. Hence arises the necessity of keeping the animals "always" in a forward, fresh condition

during the years of their early growth. When a more ample supply of food is given to an animal in this state, the fattening process commences immediately, because, all the parts of the body being kept in a full state, an instant readiness is afforded to the accumulation of additional fat and fibre. But if the carcase is lean, and wanting in the necessary quantity of muscular fibre and offal to render the parts immediately susceptible of enlargement, a time and a quantity of food are required to produce that state of body, which are often very improperly included in the time required for fattening, but which belong most exclusively to the grazing period. Hence the justice of the remark, that cattle should be fed gradually from their birth upwards.

The age of four years has been fixed as the most advantageous time for cattle to be fattened and sold. The animals that are most forward in condition will be ready in February, when the sale will commence, and be continued regularly till May, in single animals or more from the stalls, as they become prime for the butcher. If any animals remain in May, that are not fit to be slaughtered, they are sent to the field to graze, and are sold during summer, as they become ready, under the name of "grass-fed" beef.

In the mode that has been now detailed, the rearing and fattening of cattle becomes a systematic manufacture of vegetable food into fat and muscular fibre, by means of the chewing and digestive organs of an animal. To please the taste of these organs, and to afford them the nutriment that is most proper for the required purpose, constitute the whole art of the process now described. The foundation of the system lies in the young calf having an ample supply of the mother's milk, continued till it arrives at an age sufficient to enable it to live and thrive on other food. The after treatment must be kind, always to promote the onward progress of the animal. It is a very common mistake with rearing of cattle, to pinch the quantity of food, in order that they may be reared at little cost, and a more erroneous idea cannot be entertained. An animal that is stunted in growth, during its infancy, is never able to recover the natural vigour; the carcase never swells into bulk, nor enjoys the lubricating essences, nor the nutritious juices, that are necessary to promote the activity of animal life. A more destructive practice cannot prevail in any department of agriculture.

It is a very common practice to give the calves, by hand, the milk that has been drawn from the cow, and held in a pail or bucket, from which the calf soon learns to drink. A pinched allowance is also given them in order to save milk, for the purpose of making it into butter and cheese. But if these articles are imperatively required, the making of them need not be attended with the starvation and abuse of the young animal; for it only remains to appropriate a certain number of cows for the purpose of suckling the calves. House the other part for yielding milk for the dairy. This method answers both purposes, and removes the evil that results from uniting them, whereby the one defeats the purposes of the other. From whatever cause it may arise, the fact is certain, that calves fed with milk, by hand from

the pail, never thrive so well, nor become such fine animals as others that are suckled, even though the quantity of milk allowed be most ample, and to the full satisfaction of the animal. It is wholly useless to search for theory, when the fact is so evident and certain.

The second essential requisite for the profitable rearing and fattening of cattle, is the proper accommodation during summer and winter, during the different periods of their age and growth; for if an ample supply of nutritious food be necessary to supply the wants of nature, and to advance the healthy maturity, shelter and warmth are not less necessary to promote the development of the proper effects of the food which the animal consumes. During the period of suckling, the calf is confined in a single apartment of ten feet by four, or thereabouts; which single confinement prevents any annoyance by the animal going and sucking the ears or navel of the other, after sucking the dam. A door from the passage opens into each apartment. The floor is wooden plank, very closely pierced with auger holes, which carry away all moisture, and afford a dry bed for the animal. Short straws or chaff are the best litter. In the grass paddock, whither they are removed from the pens, a shelter-shed is indispensable, and an ample supply of good fresh water. The summer pasturage must be luxuriant; the fields all well watered and fenced, and provided with a shelter-shed opening to the four quarters of the heavens, and thus affording shelter from every direction.

The winter accommodation requires very particular attention. The supply of juicy food must be ample, but not nauseating; the littering of the yards must be very frequent, in order to keep the yards dry; and the sheltered shed must be roomy and warm, with the bottom sloping outwards, to prevent the water from standing within the shed. It is advantageous that the cattle eat the food under cover, which protects both the animal and the food from the inclemency of the weather. This purpose will be very easily and conveniently effected by roofing over the whole area of a farmery, like the terminus of a railway. It promises to be a valuable improvement of modern times, and places the animals, and every other thing, under cover. It prevents the heavy rains from injuring the dung, and the hot scorching suns from drying and withering the surface of the strawy materials.

A very important question has been long agitated in the agricultural world, and is yet very far from being settled, whether cattle are best fattened in open yards provided with shelter-sheds, or by being tied in stalls in a roofed house? In the case of store or keeping cattle the question is very easily solved. A freedom of moving about in the yards is necessary to promote the growth and healthy state of the animal; and the unlimited contact of fresh air very much advances the fruitful progress of animal life. In the case of fattening animals it is asserted that cattle fatten more quickly when they are confined in a warm temperature, and that the secretion of fat is encouraged by the animal being deprived of the power of any movement by reason of being tied to a stake. But the flesh of animals that live and are fattened in a warm temperature is always found to be loose and flabby, and wanting in the firmness and consistency that are imparted by a moderately frigid quality of the atmosphere. A number of animals tied in confinement are always breathing the contaminated gases; and the advantages to health are known to be very great of respiration being performed in a large volume of air. The feet of cattle tied in stalls become soft, and the animals get lame and unable to perform any travel. The feet of cattle fed in yards keep sound, and the flesh is much firmer, and is very easily distinguished by the eye and the touch of experience. The animal is fattened as quickly as when tied in a house, when the proper care is used in erecting the yards and sheds, and when the necessary attention is employed in keeping the yards dry and the animals comfortable. Less labour is also created than in removing the dung from the feeding houses. But on farms of any considerable size both methods may be very usefully employed; the animals of the more unruly nature may be tied in the house, and the quieter may be put in yards, and not more than two together. The objection to feeding in yards generally arises from putting too many animals together, and then one is disturbed by another going and pushing it about. When cattle having a thick coat of hair are tied in a house to be fattened, an advantage may be obtained by clipping the coats, in order to promote a freer perspiration, and to remove from the skin the itching and uneasiness engendered by the close covering of the hairy integument.

ON GUIDEWAY AGRICULTURE;

BEING A SYSTEM ENABLING ALL THE OPERATIONS OF THE FARM TO BE PERFORMED BY STEAM-POWER.

THE SOCIETY OF ARTS.—WEDNESDAY, DECEMBER 8, 1858.

T. D. ACLAND, Esq., in the Chair.

Mr. P. A. HALKETT read the following paper:

In bringing the subject for this evening, "Guideway Steam Agriculture," before the members of this distinguished society, I feel that it is incumbent upon me to give as full a description of the plan and machinery

as possible; but as the details are numerous, and I shall not, in the space of time allotted to me by your kindness, be able to enter into an explanation of all its parts, I hope that I may be permitted to refer members desirous of further examination of the subject to that which was published last year, namely, a letter to the Secretary

of the Royal Agricultural Society, which appeared in your Society's Journal, to the published accounts of the system in the professional papers, and to the reports of a meeting at Freemasons' Tavern; since which time, however, some very important improvements have been invented, and, amongst others, a new system of guideways by which the cost per acre may be considerably reduced, and a new cultivator suitable to small holdings.

My invention, comprising a system of permanent way which is fixed to the ground, renders me unable to exhibit for competition at the annual shows of the Royal and other Agricultural Societies, and the amount of publicity which it would in consequence obtain, is lost; but I may truly say, that notwithstanding this, there is a fast growing opinion that the system which I bring before you this evening is the one which, in all respects, best fulfils the wants and expectations of the agricultural community upon the subject of steam-cultivation.

The great advances which have been made by Messrs. Smith, Fowler, Romaine, Boydell, and others, in ploughing and breaking up the land within the last year or two, have schooled the mind to the possibility of steam being eligible for use in the field, and prepared the agriculturist to expect a system that shall perform more than one operation.

Another important change has taken place in the mind of the public, relative to the source from which the profits are to be looked for in steam-cultivation; this arises from the belief that the commercial advantages gained by Mr. Smith and Mr. Fowler are not so much in the less cost of the operations themselves as in the increase of crops resulting from those operations, and in some collateral economic advantages to which I will refer again; but it is this better cultivation and consequent larger amount of produce which is the most important consideration to hold in view, and the point in which I maintain that my system has its greatest strength; and I may say, without fear of contradiction, that there has not been a competent judge, who has seen my operations, who has not given it as his opinion that much larger returns will be obtained by my system. Let us for one moment look at the question of profit by means of produce, and profit by saving on labour, and it will be seen in which direction the most is to be expected; in the one case let us suppose produce to be increased, merely for illustration, 50 per cent., or from, say, £8 to £12, and in the other let us suppose the cost of field-labour to be £3, and to be decreased in the same proportion, namely, to £2; in the one case a profit will be made of £4, and in the other of £1.

Present produce £8, increased to £12. Profit £4.

Present labour £3, reduced to £2. Profit £1.

There are three ways in which we may expect that steam may prove beneficial to us—first by a saving upon labour. It is in this direction that the endeavours of most inventors have been turned, and it is for that only that the Royal Agricultural Society has held out its premiums to inventors. In their prize sheets the words ran thus: "For the best steam-cultivator that shall turn over the soil and be an economic substitute for the

plough and the spade." The second way is by an increase in the produce—and the third both advantages combined. My system is conceived in the last, but its forte lies especially in a much better cultivation with a view to a larger amount of produce.

I will now, as shortly as I can, describe the system and the large machinery applicable to extensive holdings, and from which, as in the case of the manufactory producing goods at a considerably cheaper rate than the cottage loom, we may expect the most important commercial advantages. I will then describe the smaller cultivator, on a perfectly different construction, and for which I have very much to thank the engineer, Mr. Grafton. Although it will not carry out the operations at so small a cost as the large cultivator, yet, by its being applicable to small holdings, it will enable land to be laid down with this system which before could not be thought suitable for it; and I will, when describing the prominent subject of the invention, the guideways or rails, invite your attention to a system of rails which was not brought before the public last year, and which will reduce the cost of the system by one-half per acre what it then was calculated at.

The diagram (Fig. 1)* will convey some idea of the guideway system of steam agriculture. This invention consists in the application of motive power to the cultivation of the land, by attaching the implements required for the various operations of ploughing, scarifying, sowing, hoeing, reaping, or other operations of culture, beneath a travelling-carriage, which moves on rails placed in parallel lines across the fields to be cultivated, by which the implements are always kept from swerving to the right or left of the line of onward motion, and the friction of the machinery is considerably reduced.

The gauge or space between the lines should be as wide as possible, consistent with the practical application of the travelling carriage or cultivator, in order to diminish the cost of rails by reducing the number per acre, as also the extent of space occupied by the permanent way. The width between the lines I have in use upon my land at Wandsworth, or upon the piece of ground at Canning-place, Kensington toll-gate, is thirty feet but there can be no difficulty in extending it to fifty or more feet.

At right angles to those rails along the headlands, separate railways are made on a lower level than the former rails, and upon each headland railway a carriage is placed, the top surface of which is on a level with the field rails, and upon this the cultivating machinery moves, and is transferred sideways from one set of rails to another; or home to the steading, where it may be used for barn operations. Supposing, then, the ground between the two first rails to have been operated upon, the machine is propelled on to the headland carriage, and by it transferred or shunted in the manner that car-

* This was a view of a farm laid down with guideways, showing the cultivator ploughing; a number of trucks taking off produce; the headland rails upon which the cultivator is moved from one set of rails or from one part of the farm to another, and a level crossing at the road, to enable it to communicate with the adjoining fields.

riages are shunted on railroads, to the next breadth of rails, down which the cultivator proceeds, and so on until it has passed over all the land to be cultivated.

The methods I have adopted for laying down the rails, varying in materials, &c., according to circumstances, are as follows :—

A trench is cut fifteen inches at the top down to the subsoil. This is filled with burnt clay ballast or concrete, and on this are laid the angular-shaped bricks, and the earth is then covered over nearly to the top of the rail. Angle irons, 17 or 20 feet in length, are laid on the top of the bricks. These are fixed down at the ends by strap-pieces, and secured by bolts to bricks in the subsoil. The angle irons are not secured to each other so as to form one continuous length, but are left unconnected at certain distances, in such a manner as to allow for the expansion and contraction resulting from the temperature.

To test the rails, I worked the cultivator backwards and forwards over a portion of them thus constructed as often as would have been necessary in cultivating a piece of land for ten years, and no movement or alteration of the materials took place, nor had any part to be repaired. Occasionally, when the machine travels over the ground, a brush is made by self-acting means to deposit a coat of tar over the surface of the rails, thus giving effectually at a small cost a preservative coat to the iron.

In this system of rails, well adapted for clay districts, the materials being very durable, the percentage for renewals will be very small. In fact, the system may be considered of an almost indestructible character.

The surface of the iron rail being angular, the tires of the wheels of the cultivator have angular grooves, into which the rail fits.

In the new and cheaper system to which I have alluded, as being applicable to small farms, a trench is cut and filled with ballast, as before described; upon this are placed sleepers, twelve or fourteen inches long, and formed of pieces of branch-wood, called "lop-and-top," cut up and split. Upon these are fixed the rails, which are constructed of creosoted timber. This system is well adapted for a wood district, and may be cheaply laid down.

When land is very highly rented, as in market gardens, the rails being placed upon posts or small piles of wood, driven two or three feet into the ground and subsoil, a less loss of land occurs than in the other system, for the land may be deeply cultivated close to the rails; but this arrangement is more expensive than either of those just described.

The space taken up by the rails is of necessity so much taken off from the cultivable soil of the farm. This, however, is comparatively insignificant in amount; for, taking the foundation of the rails at two feet and a-half, it is only the one-twentieth of the land—a loss of about two shillings per acre, taking the rent, &c., of the land at 40s. But, after all, the space of land lost is much less than in ordinary cases, with the open furrows between stetches; besides which, no farm roads are wanted, as everything required is taken on to or from the farm by the agency of the guideway machinery.

It may at first be supposed that a practical difficulty lies in the maintenance of the permanent way from analogy with existing rails, and the keeping intact the width of the gauge; but it will be seen that there is a vast difference between the speed of the railway locomotive and that of my cultivator, the one travelling at the speed of forty or fifty miles an hour, while the other travels at only two or three miles. Upon railroads the carriages and engines travel over the same ground in a year many thousand times, while in my system the carriages pass over the same spot in a year but ten or twenty times. To allow for any slight variation in the breadth or gauge between the rails, running-wheels are fitted on one side of the platform, so that they have sufficient play from side to side between the bearings, while those wheels on the other side of the cultivator have no similar play.

The bearings of the wheels are fitted to slide freely up and down, resistance to their moving upwards being offered by springs.

These springs are all of equal strength, and the machinery is so balanced that each wheel may bear as nearly as possible the same amount of weight; and the springs possess a considerable amount of elasticity, to permit the several wheels to pass over any undulation of the rails without transferring too much weight from some of the wheels to others of the series. The object in distributing the weight of the platform over a number of wheels is that the rails or permanent way may be of very much lighter construction than if the weight were made to rest on a less number of wheels.

The cultivator is driven by two engines, placed at the extreme ends or sides, which are geared together by an intermediate shaft, the ends being connected to the ends of the platform in such a manner that the whole set, sixteen in number, act simultaneously as driving-wheels. By being thus constructed, the machinery can ascend rising ground without difficulty, till the gradient reaches the point when iron slips upon iron, which is found to be one in five.

The quantity of land that can be ploughed per day by machinery, suitable to a farm of a thousand acres, is twenty-five acres; and two, or at the most three, men are all that are required to conduct this or any other operation: and when time presses, by a change of men, double this amount, namely, fifty acres, may be done in the twenty-four hours, because the operation can be carried on by night as well as by day. I have ploughed on a very dark and rainy night, and, although it was too dark to see the ploughs, in the morning we found some excellent furrows turned. You will admit, I am sure, that it is of the greatest importance to be thus able to break up the land in unfavourable weather, or for a rapid autumnal cultivation. This great economy of time is also available for seed-time, reaping, and carting in harvest.

The plough having broken up the land, a "communator," or rotary implement, is used, in character something like the Norwegian harrow, but driven at a high velocity. I have succeeded in obtaining some remarkable results in reducing obdurate clay to a state of the

finest tilth. Its mechanism and operation I will explain as I proceed.

The soil having thus been brought to a higher state of cultivation than it is possible to produce even with spade labour, there can be no difficulty in keeping it in that condition; for it will be seen that, by the guideway system of steam culture, the whole weight of the machinery, engines, and implements, rests upon the rails, and that nothing touches the soil except the implements in operation; no horses will poach the ground with their iron-shod feet; the foot-prints of the guide and ploughman will no where be seen pugging the clay and treading into a solid clod that which has been reduced to the fineness of garden-mould.

The destruction of weeds, carthing up, hoeing, and stirring the earth among growing crops, can only be performed at present during the earlier stages of the growth of the plant, and unless executed by hand-labour are always attended with difficulty, and more or less danger, from the impossibility of guiding the implements so as to operate in sufficient proximity to the plant, without running into and destroying some portions of the crop. By this system, however, I am enabled to adjust the implements and cause them to travel at the requisite proximity to the rows at all times during the periods of the growth of the plant. In fact, the hoes can be regulated to such nicety, that the operation may truly be called unerring.

All other operations, such as harrowing, clod crushing, &c., are effected by the different implements being adapted to the same, or to some other cultivator, and these are lifted and lowered, and worked by the machinery, as before described in the case of the ploughs, and may, therefore, be easily understood without further explanation. Independently of the machinery which carries the engines and implements, smaller ones are constructed for the purpose of carrying manure, the produce, water, &c. They are of the same width as the large one, from rail to rail, but much lighter and shorter, and the boxes or cart-bodies used are placed at either end, directly over the wheels, of which there are four, two on each side. These small carriages or trucks are drawn by the cultivator, and, when required, are furnished with tanks for the conveyance of water or liquid manure; and this may be distributed among the growing crops, either independently, or during the time when any of the other operations are in progress. For instance, the operations of stirring and distributing water, or liquid manure, to the growing crops, may be performed simultaneously by one implement, in the form of a hollow bar or coulter, stirring the ground to a moderate depth, whilst the water, &c., passes out at the extremity of the bar. By this means the fluid is economized, on account of the evaporation from the surface being prevented; the soil is not caked, nor are the roots drawn to the surface in search of the moisture, afterwards to be injured by the parching of the ground.

The next important operation to be noticed is reaping, which is performed by a machine constructed on the principle of Bell's or Dray's, or it may be of any other good reaper. It is attached by suitable stays to main-

tain it at the proper level, perfectly independent of any support from the ground, and has the necessary gear for communicating the motion to the cutting knives and other parts of the machine by the steam power; and the depositing of the crop after cutting is effected by a back delivery.

When manual labour is required for the purpose of weeding, transplanting, or any other light operation, the labourers are carried on to the ground by means of the trucks, upon which they sit or stand while the work is being performed, or while the crop is transferred from the ground to the truck, and by it taken away to the homestead. Thus, it will be perceived that even the injury resulting to the ground by men treading on it is obviated. These trucks may be propelled either by horses or by manual labour if desired.

THE COST.—Having described generally the system, before proceeding to the facts and results derived from my own cultivators, we may consider the cost of the whole system.

First, The cost of machinery, implements, and trucks is equal to that of horses and horse implements required for similar work, and the interest per annum may be taken as the same; but in general I think a less interest would be sufficient. In my case, for instance, with the trucks, the travelling being upon a hard smooth surface, there would be considerably less wear and tear than in carts and waggons in a field.

Secondly, the cost of the rails. The wood system is £10 per acre, and the brick and angle iron system, is £20 per acre.

When we consider the much larger sums than £10 or £20 per acre which have been expended upon land, we shall see that no practical difficulty exists to prevent money rapidly coming in to lay down the rails when the profits are known. The only true commercial way of considering the question is, what will be the returns upon the capital laid out by this system? Do we not know that land used to cost as much as the above sum frequently in draining?—that £10 or £15 is paid in marling land? I have known £20 per acre paid for valuations to an incoming tenant in a suburban farm, and I have heard of larger sums being paid by market-gardeners. Even on the continent (at Milan), irrigation works have cost as much as £40 per English acre. At Edinburgh more than £30 per acre has been paid for the same; and, according to M. de Lavergne, Mr. Caird, and the *Royal Agricultural Journal*, upon the Duke of Portland's meadows at Clipstone, as high a sum as £120 per acre for irrigation works has been paid.

Some express astonishment that I want to expend almost as much as the fee simple of the land? But what, I ask, does this matter, there being no connection between the fee simple of the land and the amount that you may profitably lay out upon it? Let us look at different modes of cultivation, and beyond, as well as in our own country. In the following table we see the most extraordinary variety. In one place we see the outlay 15 per cent. upon the fee simple, in another 1,500 per cent.

	Fee Simple. £.	Outlay. £.	Percentage upon Fee Simple.
In England	30	10	33
„ „	15	5	33
Market-gardening.....	200	30	15
In America	1	3	300
On a sugar estate (with slaves).....	6	90	1500

Thirdly. The cost of the operations.

The reduction in the friction of the machinery in consequence of travelling on a hard road, the large breadth of land possible to operate upon at once, and the few men required to attend the machinery in proportion to the work performed, greatly reduce the cost of the operations, while cartage is reduced in the proportion of the difference between drawing a weight on a ploughed field or upon a railroad.

Ploughing is 1s. 7d. per acre ; hoeing the whole breadth of 50 feet at once, 3d. per acre ; drilling seed the whole breadth, 5d. ; harrowing and rolling, 5d. ; scarifying and grubbing, 8d. ; reaping, cutting, and delivery, 10d. ; carting crops off, and manure on to, the land, ½d. per ton per mile.

FACTS AND RESULTS OF THE MACHINERY.—The engines of my large cultivator are a Garratt's 6-horse power, and a Barratt and Exall's 4-horse power. They are old second-hand engines, and being unequal in power and in weight, are not well-adapted to work together ; and the pistons are not tight in the cylinders. Indeed, though I have had the metal packings looked to, and taken in hand by a millwright and engineer, yet are they very imperfect, allowing a considerable escape of the steam. When Mr. Amos, the consulting engineer to the Royal Agricultural Society, saw them on one occasion, in a casual visit (but no trial taking place), he thought that a considerable per-centage must be taken off in any calculation for arriving at a conclusion on the merits of my system, in consequence of their condition. What the per-centage was that he stated at the time I do not now remember ; but this is not of any moment, for in my calculations I have made no deduction on that account.

In this paper it is my purpose chiefly to deal with facts ; but it is necessary, in considering the future of this system, to be informed that the engines of my cultivator are of a wrong construction for the purpose, and very leaky ; next, that the frame-work and the wheel-work are very ill-made, and the friction consequently very great ; and thirdly, that the weight of the whole is, per horse-power of the engines, nearly double of what it would be upon newly and more perfectly constructed machines.

PLOUGHING.—I ploughed 12 furrows of 10 inches in width simultaneously, making thus a breadth ploughed of 10 feet, at a speed of 2,400 feet per hour, the depth of ploughing, five inches ; the ground was very hard ; the pressure of steam was 50lbs. in each engine ; the revolutions of the engines, 120 per minute—the steam-cock was about half-open. On another occasion, I ploughed similar ground with 48lbs. in the large engine, and 52lbs. in the small one—the steam-cock half-open ; the speed of ploughing being the same in both.

On another occasion I ploughed ground that was much lighter ; it had been ploughed, and then levelled and well rammed (several weeks prior) ; on this ground I only used a pressure of steam of 32lbs. in the large, and 35lbs. in the small engine.

The above statements show that, on ploughing average land with my machine, I should use not quite 10-horse power when turning over soil 10 feet wide and 2,400 feet per hour ; and, taking out of a day's work of twelve hours one hour for change of ploughs and shifting at headlands, I have eleven hours' effectual work, which gives the following result :

2,400 feet, the length ploughed in one hour.
10 feet, the breadth of 12 furrows.

24,000 feet, the square feet ploughed in one hour.
11 hours.

264,000 square feet ploughed in one day.

And $\frac{264,000 \text{ square feet}}{43,560 \text{ square feet in an acre}} = 6$ acres per day.

Now, 10-horse power, multiplied by 5·7lbs. of coal per horse-power per hour (which is Mr. Amos's estimate used at Chelmsford, for calculating Mr. Fowler's steam-ploughing, and which was deduced from trials upon a number of steam agricultural engines, and the coals at 20s. per ton) gives 57lbs. per hour, which, multiplied by twelve hours' consumption, is 6·1 cwt. per day = 6·1 shillings ; to which add 3s. 6d. for one man for wages, and 2s. for another, and 6d. for oil, waste, &c., and we have 12·1 shillings for six acres, which gives 2s. per acre.

For a farm of 1,000 acres 25 h. p. would be required, and, taking the above as a standard, we should have 15 acres ploughed per day ; and the calculation would stand 25 h. p. \times 5·7 lbs. \times 12-hours = 15·2 cwt. of coals, to which add 4s. for one man's wages, 2s. another, 1s. boy, and 1s. for oil, waste, &c., we have 23·2 shillings, which, divided by 15 acres, gives the cost at 1s. 6½d. per acre, with a 25 h. p. cultivator.

If a larger amount of horse-power be thought necessary for more extensive cultivation, the cost will be lessened. With a 40 h. p. cultivator the amount of ploughed land would be 24 acres per day, and the cost would be 1s. 5d. per acre.

If, instead of 5·7 lbs. per horse-power per hour we take the coals at 6lbs., it would make the ploughing, in the case of the 25 h. p. machine, 1s. 7½d. per acre ; if we take the estimate at 7lbs. of coal, it would make it 1s. 9d. per acre. If we were to suppose that coals were only half the price, namely, 10s. a ton, the last estimate, taken at 7lbs. per horse-power per hour, would sink from 1s. 9d. to 1s. 2½d. per acre.

There is one fact with respect to the ploughing trials above-mentioned, to which I would beg to draw especial attention—a fact which appears to me of great importance, namely, the small amount of force with which the 12 ploughs were drawn through the ground when the land was comparatively light, because I think that this will show how, when the cultivation of a farm is carried on without in any operation treading upon the

ground, we may expect that ploughing and other acts of cultivation will be performed by my system at much less draught and power, and at much less expense even than is deduced from my own trials. With horse cultivation in my field, had the land been previously ploughed, it would still have required 2 horses to plough it again: the horses would certainly have performed a small per-centage more in the day's work; but in the example referred to, we see much more than a small additional advantage. It was there stated that I ploughed 12 furrows with a pressure of steam in the large engine of 32 lbs., and in the small engine of 35 lbs., or say 33½ lbs. in each. Now I found upon trial that it required 20 lbs. of steam to move my machine at its regular speed, without any implements being in the ground, and it therefore required only 13½ lbs. additional pressure of steam to draw the 12 ploughs. A further pressure of 13½ lbs. (which would have raised it to 47 lbs.) would have drawn another set of 12 ploughs, had I had them to put on, and the amount of ground ploughed would have been 12 acres in the day, with engines working up to 10-horse power. Had I raised the steam another 13½ lbs., namely, to 60 lbs., at which I often work the machine (and with which pressure the engines are working at 13 H.P.) the cultivator would have been capable of drawing another set of 12 ploughs, thus turning over 18 acres per day, with engines only working up to 13-horse power.

In reference to the above, I may remark that ploughs drawn in the usual manner have evidently a very considerable resistance due to their weight on the ground, irrespective of the resistance due to cutting the sod. In Mr. Pusey's experiments this resistance is put down with an average make of plough at 33 per cent. of the whole draught; but it is evident that this resistance, which is a constant quantity, will, in its per-centage to the whole draught, vary according to the nature of the soil, whether stiff or loose. The lighter the soil, the greater in proportion to the whole draught will be the per centage due to the weight dragging on the ground. In my case, however, the weight of the ploughs being transferred to, and borne by, the rails (for the plough is suspended to the cultivator, with the point of the share rather lower—½ an inch—than the heel), the resistance due to the weight of the implement pressing on the ground is taken away; and if the soil be very light or loose, only a very small resistance will take place in opposition to the pull or draught of the motive power. This, I think, will explain the remarkable result of the third set of ploughing trials above-mentioned.

Where the side of a field or piece of ground is crooked, and the line of hedge cannot be straightened, the crooked part is fenced off and used for pasture or in cultivation as usual. If roads or lanes intervene between different fields, a "level crossing" or moveable rails will enable the machinery to pass from field to field. If a farm abuts on a railroad, it may communicate with it, and by this means the produce may be sent to towns, without, in its transit, being off a rail; and marl, clay, sand, or other soils, may be brought from distances, and be deposited at any period at a very small comparative sum; by this alone a *per-*

manent increase in value may often be given to estates. Also manure may be brought from towns and distributed over the land at a very advantageous cost in comparison with that on farms at present.

THE SMALL CULTIVATOR.—The small cultivator, to which I before alluded, for the light operations of a farm, or for the total cultivation of a market-garden, would be constructed with a three or four-horse power engine. It is in two parts. The engine portion is distinct from the carriage, but is connected with it by two bars with hooks at the ends, and diagonal chains, which also hook and unhook readily. The diameter of the cylinders of the small engine on the Kensington Cultivator is only two inches, and the pressure of the boiler is generally 40 lbs. This is only one-half, or at the best three-quarters of one-horse power, and we may well conceive that if so small an engine as this (a mere toy) be considered sufficient to work a cultivator of a breadth of 30 feet, together with its second carriage, its weight of water, men, &c., how much larger a breadth may be worked by powerful engines!

In the commencement of this paper I remarked that it was a fast-growing opinion among farmers and many others that steam should and would be made to supersede horse-labour in the field. Many farmers, taking the view that my system realizes this opinion, have suggested that the rails might be laid down over several small farms, and the machinery be employed to work from one to the other; but I think that the introduction of the smaller arrangement of machinery, by which farms of 200 acres may be worked, will be a better plan, although not so likely to develop the fullest economy of the system.

THE COMMUNICATOR.—The onward motion of the communicator is in a line with the axis of the revolving tines, cutting furrows parallel with the rails on the ground. The ground, which is previously ploughed, is made into a seed-bed as fine as the soil of a mole-hill, by the action of the tines, for a depth of five or six inches; the general depth of the ploughed or broken ground may, of course, be much greater. When the soil is free from large stones the screen is used, by which means the clods not at first broken are thrown back upon the tines for a second or third blow. I found, in working the machine, that the roots of couch and other weeds were blown over and deposited on the unbroken side of the land, where they were raked up with facility.

In the hopper artificial manure is placed, and by a manure distributor, a certain quantity, for a certain distance passed over by the machine, is distributed. The importance of this complete amalgamation will be appreciated when the bearings of chemical science upon the point are perceived. Professor Voelcker, in a lecture, says, "The efficacy of a manure, or the practical effect of which it is capable, is greatly influenced by the mechanical condition of the land. I may illustrate this by referring to experiments I have made on land attached to Cirencester College, where I used superphosphate on a piece of ground which did not yield so much as another piece of ground where none had been; but I took the precaution to try the manure in a third place,

and here the yield was three-times as much as on that which had not been manured. The fact is, that on clay land superphosphates are of no use unless the land be properly pulverized. Some farmers imagine that by using the best artificial manures they do not require so much labour, or any additional labour. There can be no greater mistake, for the best artificial manures often fail, more or less entirely, for want of proper pulverization of the soil. It is of the greatest consequence that the land on which artificial manures are used should be in a high state of subdivision. Artificials can only be used with advantage by farmers who have improved agricultural implements and methods of tillage, and have paid a great deal more attention to the mechanical condition of the land than many farmers of the old school." And I may also quote the distinguished agriculturist, Mr. Hoskyns: "Now our knowledge of the chemical effects of comminution upon the absorptive powers of the soil (based upon the most accurate demonstration of the lecture-room, and speaking to the eye and to the mind as plainly and irresistibly and by the same evidence, as any fact observed in the field can do) is already far in advance of anything which our present means of mechanical division enables us to realize, even on the smallest practical scale."

If, in looking forward to the future, agriculturists and land-owners would take an enlarged view of the past and present state of things, they would perceive that not much new land has been added to cultivation during the last fifty years, nor have the imports of food been large in proportion to the consumption, whilst, in addition, the population is a more meat-consuming one. On the other hand, the population during that time has doubled itself; and, perceiving this, they will see how rapid must have been the tendency to increase in intensity the cultivation of land. It is not too much to suppose that on an average the produce per acre has nearly doubled itself.

One principle upon which I base the profits of my system is simply this: spade labour is sometimes used to cultivate farm crops; it is more costly than horse labour by £3 an acre, and more productive by £3 or £4. And this is true with the same amount of manure in both cases. In testimony of this I refer to many well-known experiments by industrial societies; to "Morton's Cyclopædia of Agriculture," to Cuthill's pamphlets, the "Penny Cyclopædia," the "Spade Husbandry in Flanders," by the Society for the Diffusion of Useful Knowledge; the works of Cuthbert Johnson, &c. Now I can perform the operations by steam and guideway in a manner superior to spade labour at less considerably, after paying interest for rails, &c., than the cost of horse labour; the difference, therefore, in produce becomes wholly a profit.

It may be, however, desired to consider a balance sheet for the year; I have, therefore, introduced two for farms of 1,000 acres, and also one for a market garden of 50 acres.

Statement of a 1,000 acre Farm on Guideways of creosoted timber, at £10 per acre.

Rail capital, &c.:	ANNUAL.								
(a) Interest at 10 per cent, thus—	<table border="0"> <tr> <td>Capital for rails £10,000</td> <td></td> </tr> <tr> <td>Interest on capital at 4 per cent.</td> <td>£400</td> </tr> <tr> <td>Repairs and renewals at 6 per cent.</td> <td>600</td> </tr> <tr> <td></td> <td>— £1,000</td> </tr> </table>	Capital for rails £10,000		Interest on capital at 4 per cent.	£400	Repairs and renewals at 6 per cent.	600		— £1,000
Capital for rails £10,000									
Interest on capital at 4 per cent.	£400								
Repairs and renewals at 6 per cent.	600								
	— £1,000								

Farming capital, &c. :—

(b) Capital for stock,	£2,500.	
(c) Locomotive cultivator, with 25-horse power engines and stunting machinery complete,	£1,900;	
implements £300, at 15 per cent.	.....	£330
(d) Ten trucks £300, at 8 per cent.	.....	24
Coal, at 20s. per day, and 250 days	.....	250
Oil, &c.	.....	10
Engine driver at 4s. per day, man 2s. 6d., boy 1s.	.....	117
5 constant labourers	.....	155
*Labourers for hand operations upon the crops.	.....	50

Farmers' annual field expenses	..... £	936
Add interest for rails	.....	1,000
Cost of cultivation by steam	.....	£1,936

Labour at homestead, expenses for marketing, and all other labour which is paid for as in the present system, need not be here alluded to.

Statement by Mr. W. Rea, Valuer to Messrs. Chinnock and Galsworthy, Land Agents, London, and a Farmer, for a Farm of 200 acres, of well-tilled land.

	ANNUAL.
Capital:—8 horses, 4 ploughs, harrows, horse hoes, scarifiers, 2 waggons, rollers, 4 carts, £500.	£ s. d.
Depreciation of stock at 15 per cent.	75 0 0
Horse-keep, corn, 100 qrs., hay 30 tons	215 0 0
Labour, 4 carters, at 12s. per week	£124 16 0
1 horse keep extra	31 4 0
3 labourers	105 6 0
	261 6 0
100 acres corn hoeing, 4s.	20 0 0
Cutting 50 acres of corn at 8s.	20 0 0
	621 6 0
Multiply by 5 for 1,000 acres	5
	3,106 10 0
† Deduct	80 0 0

Farmers' annual field expenses for ordinary cultivation on the fourth or fifth shift system, exclusive of all extra labour for harvest, &c., but including all that can be done by machinery in the field.	.....	3,076 10 0
Cultivation by steam	.....	1,936 0 0

Difference in favour of steam . . . £1,140 10 0

Which is equal to 11 per cent. upon capital for rails, and, when added to 4 per cent. (already allowed), gives a profit of 15 per cent.

The difference between spade labour and horse labour is given in "Morton's Cyclopædia of Agriculture," page 388, article "Capital," at £3 per acre in favour of the spade, when £8 per acre is average produce. If only £1 extra per acre be allowed the present horse farming, the profit will be 24 per cent.; if £2 be allowed it will be a profit of 34 per cent. In the above estimate, extracted from Morton, no crops sold off the land, or gardening ones, are considered, only grain and cattle feeding ones.

The balance sheet of a farm laid down with the brick and iron rails at £20 per acre will be as follows:—Interest of money and depreciation, £1,200; annual field expenses (deducting £96 due to less friction by this one over the other system of rails) £840, which subtracted from £3,076, gives a

* This item refers to such operations as hand hoeings and weedings, combined with the travelling machinery. If no operations are in this manner more cheaply performed than they are at present. The above includes 250 acres weeded once, and 250 acres weeded twice.

† There will be saving of £200 in machinery in a large farm over a small one proportionably, therefore deduct at 15 per cent. on £200.

saving of £1,036, equal to 5 per cent., and which, when added to 4 per cent. already received, makes a profit of 9 per cent. by saving on labour alone; to which, if £1 for extra produce be added, we have a total profit of 14 per cent.; if £2 for extra produce, we have a profit of 19 per cent. on capital for laying down a most permanent system of guideways: in fact, one of an almost indestructible character.

EXPLANATION OF BALANCE SHEET.—In line noted letter (a) I say "Interest on capital at 4 per cent." This I suppose to be sufficient interest, the investor being supposed to withdraw the money from the funds or other good security. If the money is borrowed, the interest must be larger, but it will be seen that this makes no difference in the result.

Line (b) "Capital for stock £2,500." No account is taken of the profit or interest the agriculturist makes upon the £2,500, as the same amount of capital is required for horses and horse machinery on the opposite side. Only the interest for depreciation and wear and tear is put down here.

Line (c) "Locomotive cultivator with 25 horse power." A steam engine will always work up to a higher power than is denominated by its nominal horse power, and I could easily make 25 horse-power engines work up to 40 horses (the amount of horses given on the opposite side), but this is not why I have put 25 horses in engine power as sufficient against 40 horses on the opposite side; on the contrary, for every one-horse power used in flesh I intend to place one-horse power in steam. My explanation is this:—25 horses working 12 hours for 250 days, and 12 hours extra for 20 nights, are equal to 40 horses working 8 hours for 250 days.

Line (d) "Ten trucks, &c." The interest for depreciation and wear and tear is put at 8 per cent. in this case, the wear and tear not being great.

I have gone upon the broad principle of putting one-horse power working in steam for ever horse working in flesh, but I have over estimated very much, for one horse will cart one-ton with the load running upon the ground, while one horse power will cart several tons with the load running upon my guideway. I have the advantage of the less draught of the ploughs by their not resting upon the bottom of the furrow pan, which in Mr. Pusey's experiments was found equal to fully one-third loss of power; and the draught of all implements will be less from the looseness of the soil, from not consolidating the ground by treading upon it; in fact, when we see that market gardens plough land often at 10 and 12 inches deep with one pair of horses, this will become very apparent, but I think it better to take to myself the advantages which will accrue from better tillage and more frequent hoeings, &c., than to reduce the horse power of the engines; in fact, practical knowledge will point to the reverse of a reduction being the proper direction. But, howsoever this may be, there is a commercial advantage due to the above facts in my system for which I have not given myself credit in my balance sheet.

If land is undulating or hilly, it necessarily requires for its cultivation more horses than the same acreage does upon the flat. In the case of my system, I should require the same increase of power; but, inasmuch as the labour bill on my scale is so small in comparison with the labour bill on the opposite side, namely, as £936 is to £3,076, any per-centage increase of labour on my side tells considerably less upon profits than it does in horse farming. It may still be objected that the weight of the machinery (the engines and cultivators) being considerable, an amount of waste power will occur greater than that with horses. Now, this will not be the case, for my machinery, including the engines, girders, wheels, and all other parts, can be manufactured at the weight of not much more than one horse for every horse-power of the engine, and as the

power expended in rising a hill resolves itself into two elements, the one the draught upon the implement or the load, and the other the rise of the whole weight a certain number of feet perpendicular height in a certain number of minutes, and since, in both cases, the elements are nearly the same, the power expended will also be nearly the same; but as, on my side, the advantage is found, that for every expenditure of one, horse power in horses I can do the same at one-fourth the cost, so whether the land is undulating or flat, I can do the work at a great commercial advantage.

But let me take a question of still greater importance. If it is true that a large amount of cultivation is beneficial, or if a soil be so stubborn as to require an extreme amount of labour, how easily I can give it! For instance, if I employ half as much more machinery, men, and coals, and give an amount of cultivation equal to 50 per cent. more, I can do this at the increased cost of £468, namely, half of £936; while to do the same on the opposite side would require an increased cost of £1,538, which is the half of £3,076.

If the amount of labour is increased on a farm, we shall find that on account of the cost of my operations being so small, while the interest upon the rails is a fixed quantity, the advantages on my side rapidly increase. This, which is so much the tendency of the day (especially in an increase of work requiring care), is well met in my system, by its being so admirably adapted to assist in performing and in cheapening the more delicate operations, thus facilitating double croppings, increasing largely the cattle feeding produce, the head of cattle for sale, the manure raised upon the farm, the richness of the soil, and the production of corn.

PROFITS.—In consequence of the small cost of each operation, it is found that after paying the interest on the money for laying down the rails, and an annual charge per acre for their constant renewal, a saving of from 20s. to 24s. per acre will be effected in the case of well-cultivated farm land. If to this is added from £1 to £2 per acre as the increased value of produce on account of superior cultivation, which is considered by competent judges due to the guideway system, these two sums will form an extra profit of nearly £3 per acre. In the case of a more laboured and profitable cultivation, such as rough gardening and market gardening, the additional profit will rise as high as from five to six pounds per acre. These sums form a profit of from 10 to 40 per cent. on the capital laid out for rails, which will be shared between the landowners and their tenants primarily, but eventually the benefits will go wholly to the landowners.

At first sight, the advantages in a commercial point of view in the accompanying sheets are apparent as producing a large interest for the necessary outlay for rails, &c.; but not only is this true, but to the landlord the system holds out the greatest benefits, either with or without outlay on his part, by increasing the value of the fee simple of his land, an increase in value which holds to all the future.

For, allowance having been made for interest and depreciation on capital in laying down the rails, the profit becomes in effect an increased rent, and being a permanent increase of double and treble the present rent, it will increase the fee simple of the land to double and treble its present value, in the same manner as the value of land is increased by drainage, or as the improved system of husbandry introduced into Norfolk, and copied into other counties, raised its value from five to tenfold. I have said *permanent* increase of value, for this increase is evidently not only irrespective of the source from whence the capital comes to lay down the rails, but of the depreciation and wear and tear of the rails.

It is evident that the tenant under a long lease will receive

all the advantages and profits arising from the system throughout the whole of his term.

MARKET GARDENS.—Market gardens may be admirably cultivated by this system, three-fourths of the present very costly hand labour being performed by the guideway machinery, with far more benefit to the land, as testified by competent judges who have seen it in operation; and those very portions of the labour necessary to be performed by hand, such as planting, cross hoeing, &c., are executed in a far more efficient, systematic, and economic manner. By the avoidance of walking amongst the plants for that purpose, no consolidation of the ground or breaking of the young plants can take place; and the soil is always in a loose and friable state. That most important and now expensive operation to a market gardener, watering, may be done at a small cost and a greater economy of time and water, without the injury attending the use of water carts, or of a pipe and hose, with their unavoidable injury to young plants. The crops will, from the above reasons, attain a more rapid maturity, and thus an earlier produce, with consequent larger prices, will be obtained by the market gardener.

A respectable and intelligent market gardener, who has often witnessed my operations, writes in a letter:—"I have inspected the guideway on many occasions, and find it most efficacious. There is not an operation which this machine will not do, whether it is trenching, hoeing, drilling, or any other nice work; and there is nothing, in my opinion, so agreeable to the eye as work when thus well done; and with economy—for that is the secret of large profits and small outlay—clays could be rendered comparatively light, and a season got in a few hours. The 'comminator' cleans the ground of that dreadful couch in one single operation, the land being ever so foul and stiff, leaving the soil a perfect seed-bed, casting the couch on one side, the stones on the other. * * The crops can be carried without injury to the soil, for carrying crops and distributing manure are two operations very difficult to appreciate, as there are many who have grown large root crops, and suffered greatly from the removal of those crops. I have known many instances in market gardening where a season has been lost owing to the weather being wet at the time of carting. I happen to know a market gardener who grew 50 tons of mangold wurtzel per acre, and sold it on the ground; the person who bought it cut up the land into ribbons, so that the gardener lost the next crop. Had the guideway been there the crop would have been carted off, manure at the rate of 40 tons returned, and the land tilled, and a fine crop of cabbage growing for early spring. I have often had labourers upon my cultivator, and they always appreciated the ease and correctness with which they could perform operations."

Rough gardening, in which the cultivation is on an extended scale, for the growth of potatoes, mangold wurtzel, cabbages, and sometimes corn, with its laborious and very costly culture, and its large cartage, will receive the same advantages.

BALANCE SHEET (MARKET GARDEN.)

Statement showing the Cost at which Vegetable Produce is now raised for the Loudon Markets, and the Cost at which the same could be done by the Guideway System for a Holding of 50 acres—

A steam cultivator, like the small one above described, and of 2-horse power, but capable of working for many more hours in the day than horses do, would cost £120, two trucks would cost £40, and all the implements £50: total £210. The wear and tear of this, at fifteen per cent., would be 12s. 6d. per acre.

In the following table all the operations that are performed

in the same manner in both systems, and therefore amount to the same cost, are not put down.

POTATOES AND COLLARDS—(1st Year).			
	Cost on the present system, per acre.		Cost by steam per acre.
	£	s. d.	£ s. d.
Trenching at 3d. per rod	2	0 0	0 10 0
Cartage of manure, 40 tons, exclusive of filling, &c.	0	10 0	0 5 0
Hoeings and earthing	1	0 0	0 4 6
Taking-up	1	5 0	0 5 0
Collards, digging, 2d. per rod	1	6 8	0 6 0
hoeings	1	0 0	0 2 0
	£7 1 8		
Hand operations			0 5 0
			£1 17 6
Interest on machinery			0 12 6
Depreciation, wear and tear of rails			1 0 0
			£3 10 0
Advantage in favour of steam, say	£3 10s. per acre.		

LETTUCES AND SAVOYS—(2ND Year).			
	Cost on the present system, per acre.		Cost by steam per acre.
	£	s. d.	£ s. d.
Cartage of manure	0	10 0	0 5 0
Trenching	2	0 0	0 10 0
Forking, 1d. per rod	0	1 0	0 3 0
Treading and raking	0	10 0	0 2 0
Hoeings	1	10 0	0 4 0
Savoy digging	1	6 0	0 6 0
Three hoeings	1	0 0	0 2 0
	£7 10 0		
Hand operations			0 5 0
			£1 17 0
Interest on machinery			0 12 6
Depreciation, wear and tear of rails			1 0 0
			£3 9 6
Advantage in favour of steam, say	£4.		

In market gardening watering is only practised with some crops. It is performed sometimes by watering-pots, for the injury to the land is considerable when it is carried out with horses and carts. The value of such an operation, if done to the extent of ten waterings to a crop, may be computed at from 2l. to 10l., according to the nature of the plants and the season. It will be a small advantage if this value be taken at 3l. per acre. From 4l. to 6l. per acre is paid by many market gardeners when watering is performed. This is for eight or ten waterings, and is an amount which could be done by the steam engine for 10s. an acre.

The case would then stand thus:—

Advantage in favour of steam...	£3 15 0
Add value by watering	3 0 0
	6 15 0
Deduct cost of watering ...	0 10 0
	£6 5 0

Leaving 6l. 5s. per acre, equal to 45 per cent. profit on the total capital, for rails (at 10l. per acre), and implements, engines, &c.

LOIS WEEDON.—The Lois Weedon system of cultivating wheat is also one which could with great facility be carried out by my system. I know that scientific men are divided in opinion upon the practicability of Mr. Smith's cultivation being carried on long without exhausting the land; but it

nevertheless is a fact that for 13 years he has done so, and certainly we may say that that which has been done before may, in like circumstances, be done again. The large profit to be derived by carrying it out by my system must be my excuse for bringing the subject before you; and I must add, that I do not see how it would be practicable to carry it out by any other system of steam cultivation. The rails forming guides to the implements, and the implements being suspended from above, would enable me to cultivate at all times between the rows of growing corn.

By my steam cultivation (after paying interest for money, rent, &c.), 5*l.* per acre would be cleared per annum, with wheat at its present low price, and without taking any value for the straw. If such profits could be obtained for only 13 years, the fee simple of average-priced land would have been paid twice over. By hand labour the profits are considerably less, and not easy of attainment on a large scale; while by horses it is hardly practicable.

THE WEST INDIES.—The power which the guideway culture has for working between the rows of the standing sugarcane (which in some soils remain for many years undisturbed), for the purpose of ploughing, earthing the crops, and for performing the hoeings which are so constantly required, renders my system invaluable for this laborious cultivation. The cartage of crops (a very heavy and constant operation) would also be performed. A plantation would thus be rendered, in all its field labours, independent of the inconstant and irregular attendance now obtained, and the crops would in consequence be greatly increased.

The capital required may be thought too great for proprietors in the colonies; but this is erroneous, the cultivation of sugar being one of the most costly and the most profitable in the world.

The money necessary to carry out my system is less than half that required to purchase the slaves for the field work of an estate in America or in Cuba; the daily cost of the work is far less than the keep of the slaves; and as slave estates can compete with free labour estates in our colonies, and the proprietors succeed in making large profits, the system which I propose would evidently give a very large interest for the money laid out, and would free the land of the difficulty attached to its cultivation from the scarcity of labour, or as has been the case in many parts of the West Indies, of having no labour at all to put upon it, and in consequence losing its entire value.

It must be admitted that the disadvantages under which a new principle of steam cultivation labours in its development by means of *home-made* instead of factory-made machinery is great; but it surely tells much for the probable future of my principle, that with all such disadvantages, I had still, in a few months from the time of completing my cultivator, performed the whole range of the operations of the field, and at a cost very small in comparison with that by horses; while, on any of the previously-invented principles, after more than thirty years of trial by men, some of large means and well-established talent, not one operation has yet been effectually performed by steam-power but that of breaking-up the land; while, moreover, as I before mentioned, it is hardly in the cost of the operation itself of breaking-up the land by steam-power in comparison with ploughing with horses, that any claim can be made of a saving; for instance, Mr. Fowler's average ploughing is, by the judges' report, about seven shillings per acre *versus* seven shillings by horses, and Mr. Smith's breaking-up land is computed at a fraction more; but it is rather in some accompanying circumstances that a commercial advantage is gained, such as not treading on the ground during the

ploughing operation, and a concentration of power at suitable seasons, enabling a reduction of horse-power, all of which I gain in a higher ratio, for I never tread on the ground in any one operation during the year, and I can concentrate power in a double degree, for I can plough, hoe, drill, seed, &c., at night as well as in the day. In fact, Professor John Wilson, who, you are aware, was one of the judges appointed by the Royal Agricultural Society to award a prize of 500*l.* for the best steam-plough, at Chester, did me the honour to visit my place, and having witnessed the various operations, remarked upon the point, when I alluded to it, in these words:—"Of course that which they gain in a degree, you gain in the extreme; in fact, your system would make farming operation equal to market gardening."

The following is a list of the operations which I have performed by my cultivators:—

I have ploughed, subsoiled, harrowed, rolled, used the clod-crusher, used the Norwegian harrow; I have drilled seed dry and with liquid manure, hoed the crops, used the scarifier, reaped corn, carried crops, carried water; I have watered crops over the surface of the ground and plants, and watered in rows upon rows of seed or young plants to economise water or liquid manure; I have drilled the seed between rows of standing plants, and I have performed the new operations of the "comminutor," weed-root extractor and artificial manure distributor, already explained; the underground watering between rows of standing plants, and ploughing by night.

I have enabled the following hand operations to be performed with greater facility to the labourer, greater economy in time and cost, and greater regularity than can now be performed, namely, dibbling seed, transplanting, hand-weeding, cross-hoeing, and taking off crops—without, in any case, treading upon the ground, or spoiling rows of growing plants interlined between other rows.

Besides these operations, there are many others which are not now performed by machinery or horses, which I expect to accomplish by steam machinery. For instance, I have no doubt of being able to perform dibbling seed, and also, when required, cross-hoeing; and the following very important operation—which cannot be effected by horses—could be easily done by my system, from the fact of being able to pass repeatedly over the same ground without treading or touching the land, and from the facility which I have of concentrating a large amount of power upon any one portion of land at one time.

The ground is first ploughed one deep furrow, say, in autumn. It is then lifted by a suitable broad-lifting plough; and laid in wide ridges, leaving broad pans of about four feet in width. The pan is then ploughed and sub-soiled, part of the mould at the same time becoming mixed by the operation with the bottom soil; it is then left for the weather and the winter's frosts to act upon it. Afterwards the ridges are split down and the land levelled for forming the seed bed, or the sides may be split down, and the operations reversed, and that lying under the first ridges be sub-soiled and exposed. By such operations, in the course of a short period, without bringing to the surface any of the subsoil, or any more of the subsoil than is desired, land may be reduced to a fine deep mould.

Taking a review, therefore, of all the advantages of the system, comprising the ability of concentrating a large amount of power, as shown in the hoisting of land, and so far as time is concerned, by working twenty-four hours in the day; the advantages of my "comminutor," the facility for performing the most delicate operations, the absence of all treading upon and consolidating the soil, and thereby the avoidance of injury to growing plants; the ability to water growing plants without

injury to them, and at a small cost; the ability to cart at all seasons and in all weathers; and lastly, that this can be done at a considerable diminution of cost, all interest on rails and machinery being much more than covered by the saving on labour; do we not see the vast power which steam has, not only to master all the difficulties, and effect all the operations of agriculture, but also greatly to improve the processes? proving the truth of the writings of Mr. Wren Hoskyns, in which such a result is fore-shadowed, and in whose more eloquent words let me conclude a paper, far too long, I fear, for the patience of my hearers. "Circumstances (says that gentleman) likely to form hereafter an important feature in the history of the present time—an unprecedented expansion in the trade of the country—emigration on an extraordinary scale to the gold-fields of America and Australia, acting almost simultaneously with a serious reduction in the population of the sister-kingdom, and all tending to the same result, a home for the scarcity of labouring hands—have created a demand for agricultural machinery heretofore unknown, and revived the half-abandoned question of the application of the steam-engine to the culture of the soil. The long-cited example of its general use in manufactures, and the revolution it has wrought in every other branch of art, has given place to the closer argument of the actual and now familiar-appearance in the farm-yard itself. The mere habituation of the eye is the best of all arguments in cases of this kind; the farmer who has once had a travelling steam-thrashing machine in his field or yard is prepared to hear, if not to ask the question, why its services should not be extended further; he sees the simplicity of its workmanship, and the ease and docility of its movements, and its striking concentration of power into small compass. If it is to be expected, as most of those who have given any notice to the subject appear to admit, that the steam engine, whenever it is successfully applied to cultivation, will cause a revolution, as well from the manual as from the horse-power methods of effecting it, it is not less likely that it will in a corresponding degree improve the process itself, and present a result comparatively perfect. Given the accomplishment of the act, the rate of intrinsic improvement in the act it almost fore-determined."

Mr. W. SMITH would ask Mr. Halkett whether he had correctly understood him to state that the proportion of power required for moving the machinery itself really was five-eighths of the whole power exerted in the performance of the work, as stated in the paper. Another point was, in taking into account the interest of the capital invested, Mr. Halkett merely referred to the cost of laying down the rails. He (Mr. Smith) wished to know whether he had included the cost of the machinery, and the entire apparatus; because if the calculation referred merely to the cost of the rails, he considered that a very material element had been omitted.

Mr. Alderman MECHE, having had an opportunity of examining the operation of Mr. Halkett's system of cultivation in very bad weather, had no hesitation in stating his impression that all the statements which Mr. Halkett had just made would be borne out by the results when put into practice. He knew that that was not the opinion of many of his practical friends; but there could be no doubt that what had been done by the locomotive engine on railways, might in some degree be taken as an example of what was possible under the proposed system. They found that engines drew after them, at high velocities, trains of 200 tons, at a cost of not more than half-a-crown per mile for the working expenses. Might not a similar reduction of cost be hoped for in agricultural operations? If he had correctly understood Mr. Halkett, £10 per acre was the cost of the wooden rails, and he (Mr. Mechi) believed they could be

laid at that price. The interest of that, and the wear and tear, he would take at 15s. per acre. He believed that it was well understood that the cost of horse and manual labour upon a farm was something like £3 per acre as regarded the arable portion of the land. If 20 per cent. on that was saved by the plan now proposed, that would be 15s. on the £3, which would pay for the interest of the rails. He also understood Mr. Halkett to say that the cost of his machinery might be set against the ordinary cost of the horses and the usual farming implements, which he (Mr. Mechi) believed to be quite true; and this, he thought, would be an answer to the gentleman (Mr. Smith) who had just made some remarks on that subject. They all knew that, practically, wherever they could bring steam to bear, horse-power could not in any way compete with it, either with regard to economy, endurance, or opportunities for cultivation. Therefore, the whole question might be said to depend upon whether the annual saving under this system would be equal to the interest on the amount of the fixed capital laid down in the rails. That, he thought, was the essence of the question. But when they considered the numerous advantages of the plan which he had witnessed—that it could be used in all weathers, except in hard frost, and used uniringly, and also at night—there could be no doubt that the opportunity of doing the work at the very time that it was wanted, and, above all, the superior manner in which the work itself was done, would more than compensate for any loss of interest upon the cost of the rails. He could only say, that he had witnessed the machine at work with eight ploughs and two subsoil ploughs, and the soil was lifted and thrown over in a manner which exhibited a most favourable contrast to the ordinary mode of ploughing. The ploughs, hanging as they did from the framing of the machine, acted with perfect accuracy, and nothing could move them from their line of working. The implements might break, but they could not alter their position, and would perform the work with an accuracy unknown to horse-power. He had no doubt some of his friends would put him down as being rather "fast" upon this subject, but he had applied common sense and calculation to it, and he would say that he felt personally indebted to Mr. Halkett for the lucid manner in which he had brought forward his system, and the evidence with which he was prepared to prove that which he had stated.

Dr. MATTHEW TRUMAN remarked, that according to the statement of Mr. Halkett, large farms of 1,000 acres or more presented the greatest facilities for the full testing of this system of cultivation; but farms of that extent were not to be found in all parts of the country, nor were the fields joined together in the manner best calculated for carrying out this operation. He should be glad to know what was the minimum quantity of land to which this system would be applicable. Mr. Halkett had spoken of market-gardens, but those were cultivated in a very different manner to the generality of farm land throughout the country. It appeared that it was not adapted to every form of cultivation, and if the employment of horses was necessary for exceptional cases there could not be sufficient occupation for them throughout the year. He apprehended that unless the entire estate were laid out very much in the form they saw in the diagram exhibited, the business of a farm of 1,000 acres could not be conducted entirely without horses; and he thought that was so much deduction to be made from the profit that was supposed to accrue from the adoption of this system. It appeared to him to be a most important subject, and one in which all agriculturists must feel a great interest.

Mr. WILLIAM HAWES would raise a question or two, which had nothing to do with the actual machinery employed,

but rather with the cost at which it could be applied. He regarded it as next to impossible that tenant farmers could incur the expenditure necessary to carry out that system whilst they stood in the position of tenants-at-will, or on short leases. The question of long or short leases was a vexed one amongst the agricultural community, and he thought it one of the legitimate objects of this Society to look at the question not merely as to the pecuniary cost of cultivating the land, but, having ascertained the fact that a great improvement could be introduced into our agricultural system, it became them to inquire whether an antiquated system of legislation had not tended to retard improvement, and check that which might otherwise be a great public and national benefit.

Mr. MENCH asked Mr. Halkett whether he had ever worked the engine at a higher pressure than from 40 lbs. to 50 lbs. to the square inch, seeing that railway locomotives would commonly work at as high a pressure as 120 lbs. to 140 lbs.; and also, whether he did not think advantage would be gained by working at a higher pressure than that mentioned, making the relative cost less for wear and tear?

The Earl of CAITHNESS said that 120 lbs. pressure was only an average one for railway locomotives, and a pressure of 140 lbs. might, in his opinion, be as safely employed in steam culture as in any other operation. He would ask one question of Mr. Halkett with regard to these rails. It appeared from the diagram exhibited of the machine in operation, that the rails were laid down in long lengths, and that all such obstructions as hedges and ditches were removed. Such a course, he believed, was attended with great advantages in farming; but it would be a matter of considerable expense, either to the proprietor or the tenant, to fill up the ditches, and clear away the intervening hedge-rows. That was an item which he suggested ought fairly to be added to the expense of introducing the system of cultivation now under consideration. He would also ask, in what lengths the rails were laid down, and how they were fastened at the junctions—whether fished, or in what way they were put together; and further, whether they were intended to be permanent rails? A friend of his had remarked that this system would be a most disagreeable accompaniment to a farm, inasmuch as the laying down of these rails would effectually destroy fox hunting, as horses would not like to go across the fields in which the rails were laid. Knowing that John Bull was very fond of foxhunting, and the English farmer liked good horses, he would almost be sorry to see the country spoiled for this old English sport. At the same time, he was a great advocate for anything which would enable farmers to employ steam as the means of cultivating land. He believed it was capable of being done. Whether Mr. Halkett had exactly propounded the way in which it was to be effected remained to be proved. Mr. Smith's mode of steam ploughing, from what he had seen of it, was exceedingly good, and he was sorry he had not had the opportunity of witnessing it upon a large scale. He had seen it in operation at Windsor, on the occasion of Mr. Fowler exhibiting it to the Prince Consort, and the experiment was quite sufficient to demonstrate that ploughing could be done well by steam. He had this year given to Mr. Fowler the offer to plough 200 acres of land for a friend of his, but he received an answer from Mr. Fowler to the effect that he did not undertake ploughing himself; but his advice was that the farmers of a district should club together for purchase of an engine and apparatus for steam ploughing. If that could be done, he (Lord Caithness) believed it would be a most advantageous plan. He believed if any one would establish a steam plough in a district, and let it out, although there might be some loss in the first instance, yet, if the practicability and advantage of ploughing by steam

were demonstrated, the great difficulty would be got over. The great objection to this system was, that he was afraid they would not get persons, especially farmers, to lay out the large sum that was required to carry out Mr. Halkett's plan of culture. The system itself was extremely beautiful, and, with the rails properly laid and fish-jointed, he had no doubt excessively good work could be done, without that detriment to the land which was occasioned by the trampling of horses' feet. With regard to the operation of hoeing, he felt interested in that process, particularly with reference to turnips; but the objection to this plan, as applied to turnips, he apprehended would be, that when the hoeing was done by machinery, the healthy plants might be hoed up, and unpromising plants left behind. When the hoeing was done by hand, the strongest plants were allowed to remain. Upon the whole, he thought farmers generally would not regard this system with a favourable eye, more especially as it appeared by the diagram that there was a little corner which, from its shape, must be cultivated by the ordinary means.

The CHAIRMAN said, that the noble lord who had just sat down had spoken most favourably of the use of steam, but his lordship appeared to think the farmers were so benighted a class that they had not the spirit to club together to raise a few hundreds to bring it into operation. He (the Chairman) might appeal to Mr. Shuttleworth and Mr. Howard whether, when farmers were convinced of the advantages of employing a steam engine, they did not at once procure one. He could mention the fact that in one locality, with which he was well acquainted, the farmers had formed a company, and had purchased and set to work four of Hornsby's engines.

Mr. GEORGE SHACKEL remarked that this subject had been alluded to by the noble lord as a tenant's question. He (Mr. Shackel) would rather it had been introduced as a landlord's question, as that was certainly the light in which he regarded it. It was not to be imagined that a farmer with 7 or 14 years' lease would embark in the necessary outlay. It was not his wish to throw any obstacles in the way of this plan; for with wheat at 40s. a quarter, it would be a great desideratum with the farmer to have a system introduced that would enable him to obtain a fair profit. With regard to the hoeing of turnips, the farmers were only too glad to get plants at all, without exercising any great nicety in selecting the strongest plants in the operation of hoeing.

Mr. JAMES HOWARD would say one word with reference to what had just fallen from the Chairman. He (Mr. Howard) could answer for the tenant farmers, that they were not wanting in spirit in adopting any system that was proved to pay. The farmers were a very calculating class, and he was convinced that if they were made acquainted with the existence of a really good invention they would not be slow to try it. He (Mr. Howard) had been a good deal connected with Smith's steam ploughing tackle, and could state that there had been no trouble in disposing of 40 sets of the steam cultivating apparatus, upwards of 30 of which had been sold to tenants. That fact alone was sufficient to redeem them from the aspersions that they wanted spirit to adopt inventions which they knew to be really good and practically valuable. He agreed with Mr. Shackel in considering the introduction of this system as a landlord's question, and if the proprietors of land would go to the expense of carrying out this plan of Mr. Halkett's, the tenant farmers would only be too happy to make use of it. With regard to the power of traction exerted by the machinery, he believed the London and North Western Railway Company had not a locomotive engine that would take itself up an incline of 1 in 15, at a mile an hour.

The Earl of CAITHNESS said, with reference to the remark

of Mr. Shackel, that the farmers were only too glad to get turnip plants of any kind, and were not careful to select the strongest plants in the hoeing, he (Lord Caithness) would say that that was not the plan adopted in Scotland. He did not mean to assert that the English agriculturist was behind the Scotch, for they all knew what the English farmer could do, but in Scotland the practice was to select the finest plants in hoeing.

The CHAIRMAN took the liberty of suggesting that this was not the time to discuss the comparative merits of Scotch and English farming.

Mr. S. SIDNEY knew that the farmers of England were rather in advance than behindhand in the desire to employ steam in the cultivation of the land. It was in fact the want of the present time, and if one thing was more remarkable than another in the progress of agriculture during the last ten years, it was the extreme rapidity with which the farmers had come to make use of steam, if they had anything offered them that they were sure would pay. Large sums of money were waiting to be invested in that way, when once the farmers were sure that an implement had been produced which would not be rendered valueless by after-improvement, or reduced in value and utility by modifications from time to time. He feared the time had scarcely arrived when farmers were prepared to give an opinion upon this plan; and with regard to those who were engaged in designing improvements in the application of steam to agricultural purposes, they were so much engaged in trying to perfect their own inventions that they were not prepared to say much about other plans. When he first saw the plan, the difficulty which presented itself to his mind was that the sinking of a large capital in the land would not be received in a favourable manner. Putting aside that minor point, it was impossible not to see that the difficulties were not mechanical, but financial. It was not easy to find persons prepared to sink so large a capital in the soil as this new system called for. He drew a broad distinction between the farmer who was prepared to lay out from £500 to £800 for a steam engine which was applicable to the operations of the farm generally, and him who might be inclined to lay down the permanent system of works advocated by Mr. Halkett. He did not despair of seeing Mr. Halkett's plan adopted in some places; but it must first be done by some gentleman who went into the matter to make for himself a reputation without any hope of profit. He thought the calculation of per-centages, as brought forward by Mr. Halkett, was a delusive one. There was no comparison between the case of land worth £6 an acre, with an outlay upon it of £90 per acre, or 1,500 per cent., and Mr. Halkett's system. In the former case the cultivation was by slaves, who were a saleable property, and not invested capital in the soil; therefore that 1,500 per cent. did not, in fact, represent the capital sunk in the land. The difficulty in Mr. Halkett's system was that the capital was not invested in a class of property which could be sold or mortgaged, but which stood in the same position as the working plant sunk in a mine. He would like to see the plan carried out by some of those landed proprietors who from time to time fortunately came forward to employ their capital for the public good.

Mr. BAILEY DENTON could not help expressing some regret that Mr. Halkett still adhered to figures in estimating the cost of the rails, which he (Mr. Denton) believed were too low. He entirely echoed the statement of Mr. Mechi as to the beautiful manner in which the different operations were executed by Mr. Halkett's machinery; but in the introduction of that system, they must not only knock down the

hedges and fill up the ditches, but it would also be necessary to level the surface of the country similar to the fen lands of England. He could add, that the system of Mr. Halkett was peculiarly suited for market-garden purposes; and the great reason why it had not been introduced upon those occupations was owing to the small scale on which they existed in this country; but were it possible to construct market gardens of a size to make it worth while to try this system, he believed it would answer very well.

Mr. HENRY SMITH, as a practical farmer, wished to know whether, presuming these rails were laid down upon certain lands upon a farm of a thousand acres, horses could be entirely dispensed with, as regarded the apparatus itself? He would also be glad to know by what means the produce was conveyed from the fields to the homestead; also, how the manure was carried from the farm-yard to the land?

Mr. CORNELIUS WALFORD urged the desirability of rendering the discussion of this subject as practical as possible. With the present low prices, before shown, it would be necessary for farmers to adopt some other system than the present one for cultivating the land. Looking at the tone of the discussion, he was led to the observation, that whilst the meeting saw the necessity for the introduction of some new method of culture, they were not at present in a position to pledge themselves to this or any other scheme. His opinion of the tenant farmers was, that they would readily adopt every real improvement that was introduced into the science of agriculture.

Mr. HALKETT said, in answer to Mr. Smith, that the interest on machinery and implements was the same as that for horses and horse machinery. In answer to the question as to the size of the farm, he said that the system might be used with the small machinery for farms of only 200 acres. In reply to Mr. Mechi, he thought that the question of increasing the pressure of the steam was quite an engineering one. In his own opinion, it would, perhaps, be better; but if the pressure was increased, and the cylinders were the same size, the boiler must be enlarged; in fact, the power of an engine very much depended on the size of the boiler. With regard to an observation made by Lord Caithness, in reference to hedges, he (Mr. Halkett) always understood that taking down a hedge paid for itself. He believed that it was his Lordship who remarked that by this system larger crops would be obtained. He felt sure that one had but to see the fine crop of mangel-wurzels grown by Mr. Smith with his steam plough, to be convinced of the advantages which were to be obtained by not treading on the ground during the ploughing, while in his (Mr. Halkett's) system the ground was not trodden upon at all in any operation. In reply to Mr. Howard, of Bedford, he said that locomotives could be made to go up a steep incline if they were, by a proper arrangement of machinery, made to reduce the revolutions of their wheels to the proper speed. They would then be able to go up much more than 1 in 15, even as much as 1 in 5. But locomotives were made for speed—to go 40 or 50 miles an hour. He did not mean to say that in any case they would be able to draw a train up a steep incline, for the wheels would slip; but in his case it was quite different, for, as he had before explained, all his wheels were driving-wheels. He begged to thank Mr. Sydney for the flattering terms in which he had spoken of his paper. With reference to the remarks upon the 1,500 per cent. of outlay upon the fee-simple of land upon sugar estates, he was only stating a well-known fact; this included slaves, buildings, and machinery, and he (Mr. Halkett) could see no difference in the case. If the one was

mortgageable property, so were his rails. He of course only argued upon the supposition that the system had been proved to be valuable. He agreed with Mr. Bailey Denton in considering the brick and iron rail, which was the most costly of the two, the best. With reference to the cost at which they could be laid down, he had had them actually constructed, and the entire cost of material and labour had been noted.

The CHAIRMAN, in closing the discussion, remarked that they should not encourage in that room the notion that farmers were, for the most part, the stupid, benighted race which some persons chose to designate them. No doubt there were many uneducated farmers, as well as poor farmers; and many tenants probably held larger occupations than their means justified. They did not want the Society of Arts to tell them these facts. What they wanted on the part of this Society was to point out the importance of mechanical principles, and to call to the aid of the farmers the application of those mechanical principles. The position in which this question stood was this: In the first place, farmers, from the north to the south, and even including the benighted west, were alive to the importance of steam cultivation. In the agricultural exhibitions of the country it was found that nothing tended to attract so large an attendance as the announcement that a steam engine, working a large number of ploughs, would form a feature of the exhibition. At present there were three systems of steam cultivation before the country, two of a locomotive character, and the stationary system. There was the locomotive system upon a moveable railway, introduced by Mr. Boydell. Then there was the system that had been explained that evening, of a fixed permanent line of rails. And thirdly, there were several forms of stationary engines, acting upon machinery by means of long wire ropes. All these were now before the mechanical and agricultural world; and they only awaited the getting over of some practical difficulties, which they looked to the engineering talent of the country to surmount. His friend, Mr. Mechi, had opened the discussion in a thoroughly practical manner. The simple question was, whether the saving effected by Mr. Halkett's system was greater than that of horse-power, or rather, whether the comparison of interest upon the fixed capital invested would show a balance for or against the former. He might be allowed to say that he came into the room with some prejudice against Mr. Halkett's system, and he was even disinclined to take the chair, lest it should be regarded by his friends as an indication of his approval of the plan; but he felt bound to say that what he had heard that evening had led him to take a much more favourable view. If Mr. Halkett wished to win the agricultural mind to his plan, he must show what was the utmost amount of capital necessary to be invested, not only in the first outlay for the rails, but also in getting the whole system into operation. These were matters which the agricultural mind was apt to overrate, and which, on the other hand, the engineering mind had a tendency to underrate, for they knew very well that English engineers were ready to undertake anything, if the money was only found them. In the same way, he believed, the farmers were ready to adopt any change, if it was shown—not merely upon paper, but in the field—that it would pay them. He begged to propose a vote of thanks to Mr. Halkett for his valuable and highly interesting paper.

The vote of thanks having been passed,

Mr. HALKETT, in acknowledging the compliment, remarked that he was willing to submit his system to the

severest tests that could be applied to it. He had invited the examination of the most eminent engineers of the day, amongst others Mr. William Fairbairn and Mr. Amos. He was open to the most searching investigation with reference to cost, and was ready to test his system in any locality in which it might be deemed desirable, in order to prove the correctness of the whole of his statements.

LECTURE ON "STURDY" IN SHEEP.

Mr. John Gamgee was favoured by a large attendance in the class-room of the New Veterinary College, Edinburgh, on Wednesday week, to listen to his remarks on the prevention of parasitic diseases of sheep, and of "sturdy" in particular. Mr. Gamgee alluded to the causes of sheep-rot, to the very serious losses resulting from the great prevalence of filiform worms in the respiratory organs of lambs, and occasionally to the sufferings flocks endure from attacks of the bot, or *cestrus ovinus*. In speaking of "sturdy," the lecturer stated that this was a disease of the brain, attended by peculiar symptoms of giddiness, blindness, imperfect co-ordination of movement, and partial paralysis, according to the position which the parasite causing it held in the cranial cavity. The parasite is a bladder worm, the *canurus cerebrealis*, usually mistaken for a mere bag filled with water, but which Lecke observed in 1780 to be an animal. The cystic worm, inducing "sturdy," is one of a class to which belong the hydatid in the flesh of mealy pigs (*cysticercus cellulose*), the hydatid sometimes found in the human body and in various quadrupeds, known by the generic title "echinococcus." All these cysts or bladders, proved to have belonged or to form part of different animals, were at one time supposed to have originated spontaneously by the aggregation of matter, which afterwards acquired vitality; but, as our knowledge has advanced, more especially since the researches of Ehrenberg in 1830, and of Eschricht in 1833, a certainty is established that all worms found in the bodies of animals, however remote they may lodge from the open channels which admit them into the living bodies from without, are the produce of pre-existing parents, and are developed from eggs. Mr. Gamgee described the parasites, and said that German zoologists and veterinarians had caused dogs to swallow the hydatids from the brains of sheep, with the effect of filling the dogs with tapeworms. A few rings of the latter being given to lambs, the eggs had passed through the body to the brain, and produced all the characteristic features of "sturdy." There appears to be no doubt that "sturdy" prevails among flocks of sheep in proportion to the number of dogs moving about pastures and depositing tapeworms. Mr. Gamgee has found that wherever lambs can be kept without dogs, "sturdy" is unknown; but in mountain districts, and wherever dogs are indispensable, the malady decimates the flocks. Dogs that destroy hares and rabbits are very likely to become subject to tapeworms, and the deposit of the rings of the latter proves injurious to the sheep. Mr. Gamgee proposes, as a method of preventing "sturdy"—which, he believes, will prove infallible, if properly carried out—segregation, as much as possible, of lambs and yearling sheep from dogs; destruction of the tapeworm of the dog, by the periodical use of vermifuges, such as garlic, koussou, and male fern. The fact that only lambs become affected with "sturdy" has long been known; and that is easily explained, inasmuch as old sheep do not allow of the penetration in their bodies of the tapeworm eggs. Mr. Gamgee alluded to instruments for the cure of "sturdy," and concluded by stating that he hoped farmers would adopt the method which science unerringly suggested for the prevention of so formidable a complaint.

ANNUAL REPORT OF THE LINSEED AND OILCAKE TRADE.

SIR,—In presenting our annual circular to your notice, we are sorry again to have to preface it with an expression of regret at the very unprofitable character of the trade; unprofitable alike to importer and crusher. Throughout the year transactions have been limited in extent, speculation a dead letter, with merchants holding out, and crushers on the other hand (*seeing no prospect of working to a profit*), deferring their purchases until the latest moment also. We fear our retrospect will possess less of interest than usual; no incidents to call forth any particular comment marking the course of events during the year, and prices fluctuating less than formerly. We hope, however, that a faithful record of the business done during the past twelve months will be equally useful as a register, although we have not such a retrospect to offer to your notice as during the late war and its accompanying speculative times. For the remainder of the present season we fear we can hold out but little prospect either, of profitable business; but for the ensuing season of 1859-1860 we hope there is every probability of large supplies, and with them we trust the usual satisfactory results to all interested in the trade.

LINSEED was at 49s. 6d. when the year opened; and the mercantile panic at that time gradually subsiding, and confidence becoming restored, we gradually improved to 52s. by end of the month (53s. being paid for small cargoes to go to outports), the enhanced value being also greatly assisted through the support given by Continental buyers for anything available. In February the numerous arrivals off the coast and desire of holders to quit their heavy stocks ex-gravitate caused a reaction, and old seed was done at 48s. towards close of the month. During March cargoes of new (1857) seed, which was much better than the previous crop, realized 52s. up to 53s. 6d., but old seed was still a drug at 51s. to 50s., and a very irregular trade doing. The same state of things continued during April, but at the end of that month the market was very lively, and 54s. paid for all offering. May was rather an exciting month in consequence of the enormous export demand (accompanied by a speculative forward demand for oil), and 57s. was once paid. The Continental requirements, however, being satisfied, the price relaxed to 55s. during June, and up to this date the home trade had been quite of a retail character, prices having been influenced almost entirely by the exporters. July found us with very limited stocks, and the highest price of the year was paid, namely, 59s., other descriptions of seed selling at relatively high prices, and particularly Bombay, which at this time realized 62s. to 65s. per qr. In August, dry, parching weather giving prospect of a great cake trade, the value was steadily maintained at 59s. to 58s.; there was, however, great anxiety on the part of merchants to realize going rates for cargoes to come in, although very little was actually done, and the home trade continued in a lifeless state; the values continued well supported until the end of September, when a very heavy arrival at Falmouth drove the figure to 55s., at which an *entire* clearance was effected, and some reaction was expected. None came, however, and although nominally prices were sustained for three or four weeks in October, crushers were so well supplied that the very next batch of arrivals were not placed until 51s. had been accepted. November brought fresh cargoes, and the home trade remaining in a very unremunerative state, buyers could only be tempted to operate as the value declined, and as low as 48s. 9d. was touched about the middle of the month. Since then the market has been much firmer; but, owing to the varied quality and character of the seed offering, prices have taken a wide range, namely, 49s. and 50s. for old, up to 53s. and even 54s. for some of the very fine new (1858) seed lately in. Within the last few days several cargoes have changed hands at 52s.

6d. and 52s., and some remain at Falmouth for sale, which holders are indisposed to part with, unless at fully equal rates. Throughout the year much less business was done than usual on forward contracts. A few thousand quarters sold in January and March at 52s. for shipment during the season (bought by Greek houses, of speculators), part of which were closed in at 56s. and 53s., and some as low as 50s. and 49s. A small quantity also was sold during the excited markets of July and August at 58s. for monthly Hull deliveries, October to December; but with these exceptions, scarcely a cargo has been placed until bill of lading in hand, and generally speaking not until after arrival. We need not wonder at this, when we consider the high cost to the importer, and at the same time remember how little inducement crushers have had to buy, whilst cake and oil left no margin for working expenses. About average stocks are held by consumers, and as a fair quantity may be expected within the next few months, we look for very little fluctuation in prices, especially as so little margin exists for change in the value of cake, which, after all, as far as the United Kingdom is concerned, chiefly rule the price of linseed.

The prospects of supply for the season 1859-60 are unusually good, and, if report speaks truly, we shall have the largest import ever known. Russia, both north and south, promises a large supply, and of excellent quality; and the East Indies equally so. It is only natural to expect that the high rates for some time past current at the shipping ports must have greatly stimulated the production, and, whilst the growers could get considerably more for Linseed than for Wheat, there can be no doubt to which article they would turn their attention. Nothing has yet been done on contract, the probability of unprecedented supplies rendering it undesirable, in the opinion of our crushers, to operate, unless at much lower prices than those now demanded for future shipments; and, for ourselves, we still hold to the opinion we have expressed for months past, that prices of Linseed are unsafe in this country so long as they exhibit so wide a discrepancy to the value of Wheat.

East India Seed, both Calcutta and Bombay, have come forward of satisfactory quality. Archangel, Petersburg, and other Baltic Seed, have again to be much complained of, and the Black Sea equally so; the Seeds grown in the districts of Odessa and near the Sea of Azov is as fine as ever, but that from the interior hardly bears the character of Southern Russia Seed at all. The admixture of wild Rape and other Seeds and rubbish still continues, and the Crushers' Association, which was to have effected so much good in this respect, having carried their resolutions to no practical result, the extent of admixture is regulated alone by the will of the individual shippers. One cargo is off the coast at the present time, consisting of about half Linseed and half Rapeseed, and sold at a price offering a premium for the renewal of such shipments, bought also by the very last persons we should have expected to countenance such a shipment, namely, members of that Association which so few months previously had met and passed the following, as their first resolution, viz.: "That, in the opinion of this meeting, the time has arrived for the trade of Seed-crushers to adopt measures of protection to ensure delivery of sound *unmixed* Linseed." Nearly all the Seed lately purchased, however, has been by sample; and this can but be a satisfactory method both to importer and crusher. The wide range of prices, too, will soon bring the vexatious question of admixture to its proper bearing, by showing importers how far it is their interest to send forward good Seed; and this will, we sincerely hope, set aside the complaints attendant on the old warranty of "average quality."

There is not much to remark in relation to the statistical account of imports, &c. We never shared in belief of the short supplies predicted, and we expect the import of the year will prove about equal to 1857, whilst that of the season 1858-59 will be considerably in excess of any previous one.

In public warehouses, and afloat in the docks, our stocks here consist of about 50,000 qrs., namely, East India,

31,000 qrs.; St. Petersburg, 9,000 qrs.; Black Sea, 6,500 qrs.; Archangel and Sundries, 3,500 qrs. At Hull there are 60,000 qrs., in addition to about 35,000 qrs. in the Mills; and at Liverpool, 20,000 qrs. Afloat there are 340,000 qrs.: that is to say (including the cargoes already on the coast, but not yet arrived at their destination), 190,000 qrs. of Black Sea, 121,000 qrs. Calcutta; 20,000 qrs. Bombay; and 10,000 qrs. Alexandria, St. Petersburg, and sundries.

The export into London is in excess of any former year; but the large quantity transhipped to Hull, say 50,000 qrs., and re-export to various Continental places, about 150,000 qrs., leaves us with a much less quantity than usual for consumption in this district. The aggregate into the United Kingdom will be found not to vary much from last year. Subjoined are the respective returns:

1841	....	363,461 qrs.	1850	....	603,934 qrs.
1842	....	367,700	1851	....	630,471
1843	....	470,539	1852	....	799,402
1844	....	616,947	1853	....	1,035,335
1845	....	656,793	1854	....	828,513
1846	....	506,141	1855	....	756,950
1847	....	439,512	1856	....	1,180,179
1848	....	799,650	1857	....	1,051,113
1849	....	626,495	1858	about	1,000,000

The quantities made up from 1st of July to the 30th June, in their respective years, sum up as follows, namely, in seasons:—

1843 to 1852	700,000 qrs.	1854-55	..	1,006,000 qrs.		
1849-50	.....	600,000 "		1855-56	..	644,000 "
1852-53	.....	825,000 "		1856-57	..	1,100,000 "
1853-54	.....	1,030,000 "		1857-58	..	1,053,622 "
		1858-59	will probably be	1,200,000 qrs.		

Into London the supplies were furnished from the under-mentioned places:—55,000 qrs. Bombay; 203,500 qrs. Calcutta; 440,000 qrs. Black Sea; 8,500 qrs. Baltic; 3,500 qrs. Archangel; and 4,500 qrs. Alexandria. The re-export is the largest yet known, consisting altogether of about 150,000 qrs. against 30,000 qrs. in 1857; 45,000 qrs. in 1856; and 130,000 qrs. in 1855.

Each year varies the total supplies most curiously; the excess this time coming chiefly from the East Indies, balanced by the falling off from the Baltic and Archangel. Calcutta supplied 270,000 qrs.; Bombay, 160,000 qrs.; St. Petersburg, 120,000 qrs.; Archangel, 28,000 qrs.; Riga, 70,000 qrs.; Memel, Lower Baltic, &c., Alexandria and sundries, about 60,000 qrs. The Black Sea cargoes amounted to 440,695 qrs., discharged as undernamed: Hull, 134,250 qrs.; London, 41,920; Grimsby, 37,550; Ipswich, 12,450; Dover, 10,850; Southampton, 8,650; Yarmouth, 7,500; Lowestoft, 7,400; Leith, 5,700; Lynn, 3,850; Gloucester, 3,575; Liverpool, 3,500; Dublin, 3,300; Boston, 3,100; 102,000 qrs. went to Antwerp; 53,400 to Amsterdam and Rotterdam, and 1,700 to Dunkirk.

Very little direct export took place this year from the north of Russia to the continent, only about 85,000 qrs., or little more than half that of 1857. St. Petersburg supplied 21,000 of it; Archangel, 22,000; Riga, 25,000; and Memel and sundries, 17,000; Riga also shipped 62,000 qrs. of Sowing Seed, about 25,000 qrs. to Ireland, and 37,000 to Belgium, &c.

LINSEED OIL tried very hard during the first few months of last year to reach £30 per ton, but it was not successful until end of April. After that it ruled at an average of about £33 until middle of October; since when the course of prices has been almost identical with those of the first three or four months. The prices opened at £29, and reached £29 15s. a few days afterwards; but the rise brought out several lots of warehouse Oil, and the advance was at once lost. In February the market was sick at £28, and an occasional sale at even less. Oil was found scarce in March, and improved to £29 10s.; but when April arrived, it had again receded to £28 10s. Some considerable purchases were made at this time for the American market, and a rise of £3 per ton was established early in May, and a further advance to £33 10s. as the month progressed. A slight reaction followed during June, but in July prices recovered, and the highest price of the year was paid, namely, £34 10s. up to £35, for future monthly deliveries. Until now forward prices had generally ranged from 20s. to 30s. per ton in advance of the value on

the spot, but since this date there has scarcely been any difference between them. During August very little was doing, and £34 to £33 the quotation. In September prices gave way, in consequence of heavy resales of oil bought some time previously on continental account for forward deliveries, and £31 10s. was the value at the end of the month. Before October had passed, £29 10s. was again the figure, and early in November it sold at £28; but from then until now, £29 to £29 10s., and an occasional attempt at £30, has been the price, with a large and steady trade. The export demand has kept stocks in a very narrow compass, that oil is not plentiful; and although during the last few days the tendency has been to improvement, the make is so large, and the unwillingness to hold stock so great, the slightest cessation of that demand causes a relapse. Throughout the year the character of the trade has been most legitimate, singularly marked by an absence of speculation. Within the last two or three weeks, however, a little of the old leaven (so natural to dealings in this article) is showing itself, recalling to mind the good old speculative times of 1855 and 1856. Some contracts have been entered into for delivery, the ensuing twelve months, the price being £30, and considerable engagements are likewise open at about this price for deliveries up to June next. The Government returns we expect to show an exportation nearly equalling 1856, namely, 28,000 tons; in that year a large proportion went to Germany and the United States; but this year, France, Holland, and the Mediterranean have absorbed the bulk of it. In 1857 the export was 16,250 tons, in 1856 28,000 tons, and in 1855 17,500 tons. The prospects of the seed market are likely to keep prices steady the next few months; but if our anticipations as to supplies in July are realized, we may look after then for an average more as-inflating to that of the period antecedent to the war with Russia. The value to-day is £30 in all situations.

LINSEED CAKES.—Town-made have scarcely varied in price for the last two years; £10 to £10 10s. was the value in 1857, and £10 10s. to £10 has been the price of 1858; a little below during the mid-summer months, and a little above during the drought of August and September. The consumption, however, has been much curtailed of late, owing to its high relative value to wheat, and consumers have actually been giving their cattle this article in preference to cakes, finding it more economical to do so. The value of meat will probably assist to maintain prices to the end of this season; but unless we have a greatly improved state of things in Mark-lane, we must not expect the present quotations to hold after next spring.

The import of FOREIGN CAKE during the past year will be found short of 1857, by about 25,000 tons. The trade opened in January with an active demand for all descriptions, which continued throughout the month, the quotations being £10 10s per ton New York barrels, £10 for bags; Western American, £9 5s.; and Square Marseilles, £8 12s. 6d. c. f. i. Early in February the market was quiet, but arrivals being short and stocks reducing, there was more activity towards close of month, and previous rates freely paid. The demand continued throughout March, and but for the timely arrival of large supplies, prices must have advanced, as stocks had become exhausted. During April we had a good demand, and sellers giving way slightly to save landing charges, buyers were induced to purchase largely. In May a further reduction in price took place, consequent upon the large arrivals during that month, the quotations being £9 15s. ex ship for barrels, and £9 10s. bags; Western, £9. Towards the end of the month, however, the demand continuing, and with diminished supplies, we advanced 5s. per ton on all descriptions, and throughout June this advance was maintained. Early in July we had a quiet trade, but afterwards more inquiry; the imports then remained small, and no stocks in warehouse, an improvement in value followed, and £10 10s. to £10 15s. was realized for barrels; bags, £10 5s.; Westerns, £9 15s. During August, prices were again in sellers' favour, from same cause, and a further advance of 5s. and, in some instances, 10s. per ton obtained. In September we were firm, but towards the close there was less activity, as also in the early part of October. The small supplies, however, kept prices steady, but at the end of the month they gave way again 5s. per ton, and during all November and December

we have had a dragging trade at gradually declining rates, and our quotations to-day are £10 5s. for barrels; £9 15s. bags; £8 12s. 6d. Westerns; and square Marseilles, £8 f. i. The stock in warehouse amounts to about 2,500 tons.

FISH OILS.—The business in this article has been very limited during the year. **SPERM OIL** was £68 in January, rose to £87 in April, continued steady at about this price until lately, but is now quoted £22. **PALE SEAL** has fluctuated between £35 and £40. **SOUTHERN OIL** from £42, declined to £31, rose again to £39 in August, and after touching £32 early last month, is now £36. **COD OIL** opened at £30, had advanced to £35 10s. by Midsummer, and has since gradually fallen to about £31.

RAPESEED AND OTHER OIL SEEDS.—The imports have amounted to 200,000 qrs., and the re-export to 100,000 qrs. In dock and warehouse there are about 45,000 qrs. of Rape, and 20,000 qrs. of other oil seeds; and afloat, nearly 60,000 qrs. The qualities have varied so, it is impossible accurately to follow the course of prices; and we must content ourselves, therefore, with saying they have ranged from 6s. for heated Black Sea Seed, up to 70s. for finest Bombay. Poppy Seed is 52s., Niger 38s., Teel, Sursee, Gieggely, and Sessame 53s. to 59s. according to quality.

RAPE OIL.—The consumption continues to increase, and a greater proportion of English-made oil has been used than formerly. The absence of speculation the past year has kept

prices uncommonly steady; English refined Oil ranging from 40s. to 47s., and foreign 2s. per cwt. higher. Brown Oil has borne a relative value of about 3s. 6d. less than refined. Our lowest quotations were in April: highest at the end of July; and the article is steady to-day at 45s. for English.

RAPE CAKES.—We may re-write our last year's paragraph on this article, namely, that "they have been in varying demand throughout the year, at about £5 10s. per ton for English, and £6 10s. for best foreign makes."

TALLOW possesses but little interest in a circular devoted chiefly to Linseed and its product; but although there is little analogy between Tallow and Linseed Oil in this country, it is otherwise abroad, and the value of it consequently must exercise considerable influence upon the exportation of the latter article; we therefore continue to publish our resumé of the prices current during the year. 53s. was the price quoted in our last, next 54s. 9d., and in February 52s. In March again, 54s. 9d. to 56s.; and in April it was nearly as dear; May, 54s. to 53s.; June, 53s. 6d. to 52s.; July, 50s. to 48s.; and August, 49s.; September, about 50s.; and the fluctuations since are so trivial they are scarcely worth recording. To-day's value is 51s. Throughout the year the trade has marked no features of any interest, and it has partaken of the dullness common to almost every article of commerce which has characterised the business of the year 1858.

London, Jan. 1.

EDWARDS, EASTY & Co

TRADE OF THE PORT OF HULL.

REPORT FOR THE YEAR 1858.

From the influence of the severe "panic" both in Europe and America at the close of 1857, the operations of the manufacturing and commercial classes of this country during the past year have been characterized by so complete an absence of speculative enterprise, as to leave a depressing effect on business generally; nevertheless, sound and healthy action has existed for some time in the manufacturing districts, and with an easy money market, and the extended prospects opening with the new year, a more active state of things may be fairly anticipated. The trade of this port during the past year has not continued to show that advance which under other circumstances was to have been anticipated. The tonnage entering the port was last year 1,080,200 tons, against 1,083,632 tons in 1857, showing a trifling difference of 3,432 tons, whilst the steam tonnage exhibits a slight increase, being respectively 45,993 tons, against 45,930 tons. The tonnage of vessels reported inwards on foreign voyages was 743,751 tons, against 737,331 being an increase over 1857 of 6,420 tons.

WHEAT.—The imports of this article have been closely approximating to last year, the decrease being about 25,000 qrs. as compared with 1857. In taking a retrospective view of the wheat trade since our last annual circular, we must notice that the present year has been entirely devoid of those serious fluctuations to which it is so often subjected, a slow and gradual decline being, with one or two exceptions, its chief characteristic throughout the year; a bountiful Providence, for the last two in-gatherings of the crops, appears to have furnished the world at large with abundance, and peace and plenty happily prevail. The high price of all cereals, but more especially wheat, during the late war, caused increased exertions—not only on the part of our own agriculturists, but also in most of the corn-producing districts in Europe as well as America—to stimulate production to the utmost; and the improvements in agriculture, both at home and abroad, have made rapid progress within these last two or three seasons. Thus the country is placed in a better position as regards food for the masses than has been the case for several years past; and another favourable seed time has laid the foundation for cheering prospects for the new-born year. A monthly review of the fluctuations in value would not only be tedious, but uninteresting; suffice it to say, that at the commencement of the year good red English wheat was worth 46s. to 48s. per 50 lbs., receded in February to 42s. to 45s., and continued gradually drooping until June, when prices were

as low as 40s. to 42s.; in the month of July the animated accounts received from the Baltic, the Rhenish Provinces, and Germany, which countries suffered from the severe drought prevailing, gave a little impetus to the trade in this country, and prices advanced in July to 45s. to 48s.; but the improvement was short-lived; the favourable promises for our own crops, and the prospect for an early harvest, caused prices again to recede until the end of August, when new English wheat appeared in the market, and sold at 45s. to 47s., gradually declining during September, October, and November, until it reached 36s. to 40s. in December. Opinions differ materially as to the results of the late harvest; some are sanguine enough to say that it exceeds the crop of 1857, while others affirm it to be nothing more than an average. No doubt the dry season was suitable to the heavy soils, at the same time unfavorable to the light lands; and were we to venture an opinion, there is a full average crop. It is our duty merely to record facts; and we find that a quarter of good wheat at 40s., its present value, and Norfolk flour at 27s. 6d. per sack, is lower than has been the case for the last six years. The extreme low prices of English wheat has occasioned foreign to be greatly neglected. The stocks are about the same as last year (75,000 qrs.), the greater portion of which is of secondary quality; and we close the year with symptoms of improvement, a slight advance in agricultural markets, and a more decided feeling of confidence amongst the trade generally.

BARLEY.—This article has again maintained its prominent position amongst our imports of grain in the present year, and though somewhat short of last year, the import is one of the largest in the last decade, the total being 214,363 qrs.—principally from Denmark, Sweden, and the Black Sea, whilst very little has reached us from the German provinces bordering upon the Baltic. The home crop for the last two years having neither been large nor remarkable for fineness of quality, the foreign imports have gone freely into consumption, and only at the end of the year now closing, the supplies, especially of grinding qualities, have been somewhat in advance of the consumption, and some accumulation in warehouse has taken place in consequence. Prices have undergone comparatively little variation, the difference between the extremes being only some 3s. to 4s. per qr. both on malting and grinding descriptions. The highest rates were in the beginning, and the lowest in the middle of the year. Very fine malting qualities of English, being extremely rare, still command good prices—

say 38s. to 40s. per qr. of 32 st., but medium English and foreign range at about 30s. to 32s., whilst grinding is at 27s. per qr. of 30 st. for stout, down to 25s. 6d. for thin, at which rate the year closes. The stocks in hand are 35,000 qrs. against 40,000 qrs. last year.

OATS.—The imports are much less than last year—say only 61,435 qrs. against 99,500 qrs. With large stocks left over in warehouse, prices ruled low in the commencement of the year, but advanced 5s. to 6s. about the middle of the year, in consequence of untoward accounts of the growing crops in the Baltic provinces and other foreign parts, whilst appearances did not prognosticate any abundance at home. So far no deficiency has been felt in the deliveries, albeit a portion of our usual foreign supplies are being diverted into other channels, and the advance above alluded to has again been lost. The year closes with a value of 22s. to 23s. per qr. of 24 st. for good provender, and stocks only 8,000 qrs. against 28,000 qrs. last year.

BEANS.—The imports are nearly on a par with last year, say 55,371 qrs., against 57,526 qrs. in 1857, and we close the present year with prices exactly the same as at its opening, say 38s. to 39s. per qr. of 36 stone for good foreign middles, whilst in September they ruled some 7s. higher, owing to the almost hopeless appearance of the crops, especially in this country. No doubt the yield all over the north of Europe has been a poor one, though not quite a failure, as at one time expected. Stocks in hand are 15,500 qrs., against 9,500 qrs. last year.

PEAS.—Our imports have again been fair, say 25,821 qrs. against 24,004 qrs. last year, and prices have been remarkably steady throughout the year, white boiling sorts having ranged between 40s. to 44s., and now stand at 40s. to 41s. per qr. 50 lbs. The yield, both at home and abroad (Canada excepted) has been one of the smallest on record, and blue qualities are not to be had in any quantity in any country. Present stocks are same as last year, say 2,500 qrs.

AGRICULTURAL SEEDS.—During the present year very considerable fluctuations have occurred in the value of both red and white cloverseed. The supply of new red which came forward last season proved considerably beyond what had been expected; though a good consumptive demand was experienced, there was yet a larger stock left at the close of the season than for some years previously. With liberal imports from abroad and a fair English crop, though of indifferent quality, all descriptions declined, and at the close of the season had received 12s. to 15s. per cwt. from the highest point. During the summer, reports of the deficiency in the hay crop caused some excitement, and prices rapidly recovered 6s. to 8s. per cwt.; the principal demand being from abroad, large shipments were made from this country to Hamburg, Holland, and Belgium, as well as to some other continental ports. As respects the new crop, the growth of the present year, the reports that have reached us to the present time from Belgium, Holland, and Germany, tend very much to confirm those already referred to; and we are given to understand that these three countries will require the greater part if not the whole of their new crops of red to supply their own local demands. White cloverseed, as stated of red, closed the season with a much lower range of prices than it opened, and there was only a moderate stock to hold over. Shortly after the season, very reduced prices were, in some cases, accepted rather than face another crop. The new crop of white being much earlier gathered than the red, by the month of September it was pretty well ascertained that in Germany, Holland, and Belgium there was a great deficiency, amounting in several districts to almost a failure, and these reports have only been confirmed and strengthened up to the present period; and prices have advanced, from the lowest point after the season, £20 to £25 per ton, and holders remaining quite firm and confident at the advance, fine seed being now quoted at 85s. to 90s. per cwt.

LINSEED.—The import of this article last year was 373,285 qrs., against 487,272 in 1857, showing a deficiency of 112,000 qrs., which is almost entirely exhibited in the reduced receipts from Petersburg, Archangel, and the Prussian ports; the Black and Azov Seas and India having supplied us with nearly an identical quantity with the previous year. In addition to the direct imports, about 42,000 qrs. were received from London and Liverpool, giving a consumption for the year of 487,000 qrs., or nearly 10,000 qrs. per week; the total stock

at present in the hands of importers and crushers being about 100,000 qrs., against 170,000 in 1857. A great proportion of the present stock is of inferior quality. The large consumption in the beginning of the year considerably reduced stocks, and before the spring imports they were almost exhausted. The result was that the article has been maintained the greater portion of the year, at prices which enabled the crusher to obtain little or no remuneration above the bare cost of manufacture; still as oil and cake advanced in price during the summer months, holders of seed were enabled proportionately to enhance their demands until the large simultaneous arrival at the outports in the month of September from the Black Sea exposed the artificial state of prices, and in October a decline of fully 10s. per qr. on the extreme quotations of July and August had to be submitted to. Taganrog seed on the spot was worth 50s. to 51s. the commencement of the year, but improved in April to 53s. to 54s., until the maximum of 59s. was arrived at in July. The decline in the value of the products of linseed from the middle of August also operated to depress prices. The quality of the supplies both from Northern and Southern Russia proved very inferior, and added much to the unremunerative character of the business of both importer and crusher. The prospects, however, for this year's business are satisfactory; advices from abroad (as proved by some small arrivals at this port) speaking favourably both as to the quality and quantity of the new crop, with a moderate range of prices. At the close of the Black Sea seed was held at 50s. to 52s., fine Petersburg 47s. to 49s., Bombay 56s., fine new Riga 46s., old inferior 36s. to 40s. per qr. of 51 lbs.

LINSEED OIL.—The past year opened as it has closed, with prices at about their lowest point. The low rates in the beginning of the year, the reduced stocks, and the unremunerative character of the crushing trade, led to considerable demand from foreign parts, to which the open winter allowed free export, and prices advanced from £23 in the first two months of the year to £31 in the end of April. The demand from abroad continued, and the market became considerably excited during May, when, in consequence of scarcity, and the advanced prices of seed, the value on the spot went up to £33 10s., after which a slight reaction set in, which continued till the end of June. The export at this period amounted to 6,671 tons, against 3,962 tons the previous year. In July, however, the price again advanced; and in the middle of the month it attained its maximum during the year, viz., £34 5s. on the spot, and £35 for the end of the year. This value was maintained up to the middle of August, when a gradual decline commenced, which continued through the months of September and October, and in the first week of the following month the price reached its lowest point, £28, between which and £29 it fluctuated up to the close of the year. The prominent feature of the trade has been the extraordinary extent of the exports to the continent, France alone taking 2,877 tons, against 990 tons last year. The total exports this year are 15,000 tons, against 7,142 tons the previous year, as noted in the tables annexed. Stocks smaller than usual, estimated in all hands at 1,400 tons.

LINSEED CAKES.—The foreign import of the year has been unusually small, being only 3,600 tons, against 14,261 tons during the previous year; the market, with the exception of April and May, has consequently been very barely supplied throughout the year, and best makes of foreign brought within 5s. per ton of Hull-made; other qualities in proportion. Of English cakes we commenced the year with moderate stocks, and a value of £10 per ton, which was maintained with little variation up to March, when the limited import and supplies from the mills induced more activity, but without enhancing prices. The mild weather in the spring months caused a reduction in the value in the end of May to £9. In June and July the long-continued drought created great fears of the failure of the spring-sown corn and grass crops, both in this country and on the continent, under the influence of which contracts were made for cakes at £10 to £10 10s. for delivery in winter, which price was maintained through August and September. The partial failure of the turnip-crop brought a few buyers into the market in the beginning of October, but the low price of cattle-feed, together with the extraordinary revival of pasturage after harvest, caused the value gradually to decline, and we close the year with prices at £9 5s., and with stocks of foreign of all

sorts not exceeding 400 tons. It must be added that the farmers, to a very great extent, have been using the inferior part of their wheat-crop to feed their cattle, owing to its extreme low value—thus displacing, to a great degree, the consumption of cakes.

RAPESEED.—The import this year is 2,412 lasts, against 6,100 last year, and 1,690 in 1856. The bulk being generally on crushers' account, but little has appeared on the market. In the beginning of the year we quoted £30 to £31 per last, a nominal figure, there being no demand except a trifling one for foreign account. Towards the middle of the year the appearance of the crop, in consequence of drought, being unsatisfactory, an advance of £1 to £5 took place, and in August £36 was paid. Prices both of Danish and East India declined towards the end of the year to £33 for the former and £28 to £31 for the latter, according to condition and quality.

RAPESEED OIL.—The trade during the year was a purely consumptive one, at pretty regular prices: an advance took place in the middle of May, arising from the high price of seed, which reached £45 in August for brown English. Since then prices have drooped about £2 per ton, and we close the year with brown at £43 10s., and refined at £47 per ton.

RAPE CAKES.—The past year commenced with limited stocks and low prices, £5 15s. being about the value in the early months for fine green sorts. In April it reached £6 10s., the highest price during the year, and continued with slight fluctuations to the end of the year, which closes with prices of best feeding quality at £6 5s. for both English and foreign. Import this year 4,000 tons, and stocks about 300 tons.

FLAX.—Although the linen trade experienced less injury from the effects of the "panic" at the close of last year than the other branches of our great textile manufactures, yet the demand for flax was of a quiet character and accompanied with little variation in prices during the first few months of 1858. In the month of June the reports, which had been previously circulated and only partially believed, of the short supplies to be expected for shipment at the Baltic ports began to be fully verified; this was more especially the fact at Riga and the Prussian ports. Towards the end of the month it was also found that the extremely hot weather and long-continued drought had inflicted serious injury on the continental crops; the spinners consequently now began to be alarmed at the prospect, and to evince a desire to get into stock. In July and August prices went up £4 per ton. Early in September the deficiency in the imports into the United Kingdom, more especially in the Scotch ports, assumed a very serious aspect, and the conviction was forced upon all parties that the very reduced stocks of flax both at home and abroad must bring on higher rates of value; extensive transactions in consequence took place at advanced prices. Towards the end of October, the spinners again came forward, being excited by the presence of buyers from France and Belgium, and prices took a further considerable rise. In November, the French bought on an extensive scale, both in the Dundee and Hull markets; and the certainty of a large deficiency in the article to meet the demands of the spinners in Great Britain and Ireland, as well as in France and Belgium, drove up the prices several pounds per ton. The early appearance of frost in the Baltic ports further agitated the trade. The mark WPK, which on the first of June was quoted at £14 to £15, had now reached £58 to £60 per ton. In December, a large business was again effected with France at extreme rates, leaving the stocks in a diminutive compass, and totally inadequate to meet the requirements up to the coming spring. The same active demand has existed both at home and from the French spinners for flax tow, and the prices for Archangel tow No. 1 and 2 have run up from £37 and £35 in June to £50 and £48. The market closes in an excited state, and the nearest quotations for the several marks of flax are as follow: WFPK £65 to £66, HFPK £63, FPK £62, St. Petersburg 12 hds., £59 to £60, 9 hds., £48. The Petersburg flax received at this port during the year has generally exhibited an improvement in the dressing, causing it to be more adapted to the wants of this district than in former years. The new classification adopted in the marks at Riga has given greater satisfaction. The total imports of flax into Hull during the year amount to 17,913 tons, against 19,466 tons in 1857, 18,941 tons in 1856, and 14,909 in 1855. Of tow and cordilla, 3,352 tons (viz., from St. Petersburg 1,780 tons, Archangel 920 tons, Hamburg 80 tons, Holland 190

tons, Narva 210 tons, Pernau 10 tons, and from sundries 62 tons), against 3,381 tons, 3,859 tons, and 1,554 tons in the three previous years. The exports of flax from this port to France and Belgium are 1,605 tons, and of tow 730 tons, some further quantity being in the course of shipment. The total import of flax, tow, and cordilla into the United Kingdom this year is about 30,000 tons less than in 1857.

HEMP.—The total import of this article has been 4,159 tons (viz., 2,039 tons from Petersburg, 2,097 tons from Riga, 62 tons from Bombay, and from sundries 21 tons), being 1,200 tons above that of 1857, and about the same as that of 1856. The prices of purely roping descriptions have remained without alteration from the opening rates at the commencement of the year—viz., £29 to £30 for clean; and the prospective demand for such is certainly not favourable to any advance in price. For the finer descriptions a more active inquiry has prevailed of late, in consequence of the advancing price of flax, they are still relatively so much cheaper, and can be applied to so many manufacturing purposes wherein the consumption of flax, &c., largely enters, that there is every probability of a much extended consumption of fine barked hemp in future. The present quotations are—for clean, £30; half-clean, £28; Riga Rhine, 32; and Pass. £31 per ton.

TALLOW.—Our import is 2,834 tons, against 2,174 in 1857, a large proportion of which is for the interior. The trade has been chiefly a retail one, and the value regulated almost entirely by the London market, which has this year ranged from £57 to £48 10s., the price closing dull at £51 per ton.

OLIVE OIL.—The import this year has been 4,400 tons, against 3,410 in 1857, and 4,920 in 1856. The market was very steady nearly the whole year, gradually falling from £50 at the beginning to £45 at Midsummer, and so continued till the middle of November, when, from an improved trade in the manufacturing districts causing a better demand, accounts of a very bad crop in some places, and a total failure in others, a sudden excitement took place, and the price ran up to £50, where it remains at present. Although the stocks in the kingdom of Naples are stated to be large, it is supposed present prices will be maintained, and perhaps a further advance take place, as the stock here is under 40 tons (chiefly Seville), and light in other parts of the kingdom. It is not expected that seed oil can be supplied or produced so as to cause any material effect on the price of olive.

CATTLE BONES.—With hardly any stocks in the beginning of the year, and few arrivals, prices continued to advance to 47 per ton for best quality up to April, and were maintained within 10s. of that price throughout the season, since which they fell to £5 10s. to £5 12s. 6d.; and these prices continued to rule to the end of the year. The import is 17,000 tons, against 10,000 in 1857; and the stock on hand is estimated at 2,300 tons.

TAR.—The import reached an aggregate of Stockholm and Archangel together of only 17,527 brls., against 26,910 brls. last year. The bulk of this supply arrived in the earlier part of the season, and owing to a slow demand from the trade, was mostly disposed of coastwise, at prices varying from 12s. to 13s. per brl.; a small portion of Stockholm having been taken to warehouse, which later on brought 14s. per brl. on the sale. No further arrivals subsequently taking place, and dealers becoming generally low in stock, there has latterly been some stimulation in the demand, and a large cargo of Stockholm, recently arrived, is reported to have changed hands at about 15s. per brl., sold partly to the trade, and the remainder disposed of coastwise. There were only a few shipments brought forward from Archangel, which description seems to be fast losing, in the estimation of consumers, that superiority over Stockholm which, for some manufacturing purposes, it formerly held.

TURPENTINE.—The direct import last year was 5,000 brls. (with about a similar quantity coastwise), against 7,353 in 1857. In consequence of unfavourable accounts from America, the value advanced in the beginning of the year from 34s. per cwt. to 46s. in March, and in June to 48s.; it receded, however, almost as rapidly as it advanced, and the year closes at about 40s. per cwt.

IRON.—The imports this year are 19,400 tons, against

38,863 tons in 1857. The anticipation of a better demand during the past twelve months has not been realized; the stocks on hand remain very heavy, both in the hands of importers and manufacturers, and prices lower than they have been since 1853.

BRIMSTONE.—The import this year has been about 1,728 tons, against 569 tons in 1857, and 1,363 tons in 1856. The article has undergone several fluctuations during the year, arising from causes difficult to account for, the price varying from £7 to £12 per ton. The only stock here at present consists of about 100 tons still afloat, the value being about £8 5s. per ton for best seconds, ex ship.

COALS.—The exports taken from the Custom-House lists for the year 1858 are 129,300 tons. The deficiency compared with last year of 3,545 tons arises from the colliers being partially out in the West Riding.

WOOD.—The heavy stocks of deals held in this market at the commencement of the year, of the imports of 1856 and 1857, on account of the shippers at Petersburg, Wyburg, and to a more limited extent Quebec, together with the very low rates of freight in the spring, had a seriously depreciating effect upon the prices of wood imports generally, which continued for the first eight or nine months of the season. Large sacrifices had to be made by the holders, in some cases to the extent of 30 per cent; these cargoes were thus forced into consumption; a more healthy state of business was the result, which, together with a rather improved country demand, the enhanced prices required by the foreign merchant, increased rates of insurance usual at the fall of the year, combined with the prospect of a better and a profitable trade "looming in the future," enables us to report a greater market value of the present stocks of deals, to the extent of 15s. to 20s. per std. hnd. upon the lowest prices

obtained during the year. In balt timber the improvement in price has not been so manifest, owing to there being few works in progress of magnitude requiring strong timber in the district commanded by this market. In shipbuilding timber, elm and yellow pine only are used in consumption for the decks and fittings of iron-built vessels. There having been only one new wood-built ship launched in this port during the last two years, there is no demand for this description of goods; but in number and construction of iron-built ships of great burthen, we are rivalling the largest ports in the kingdom. The supply and demand of sawn wood, the produce of the north of Europe, have been singularly proportionate, whereas the imports over the consumption of hewn is nearly fifteen thousand loads, which is sufficiently accounted for by our previous remarks. The average of stock of all kinds may be considered about equal to that of last year at the same period, and below that of 1856. This opinion can only be formed by observation, as this port forms an exception to those of London and Liverpool, where the stocks are yarded by the Dock Companies, and the returns can be ascertained on any given date of the precise import, consumption, and stock on hand.

SHIPPING.—The year opened with few freights in the market, and the rates accepted by shipowners were, in many cases, unremunerative. Towards the close of the season, a decided improvement took place in Baltic freights, but the general character of business in this branch of commerce for the whole of the past year has been discouraging; there is now, however, a much better prospect, and it is to be hoped that the recent opening up of new countries to our trade will be productive of beneficial effects.

P. BRUCE,
Secretary to the Hull Chamber of Commerce.

ANNUAL REPORT OF THE LIVERPOOL WOOL TRADE.

GENERAL REMARKS.—We commenced the year in the midst of a panic of unusual intensity, with trade completely paralyzed, and the commercial institutions of the country—and indeed of the whole world—shaken to their very foundations. Several months passed over without any visible signs of amelioration, notwithstanding the partial removal of pressure in the money market, and each successive return showed still further retraction in our general exports. Although these have latterly very much increased, it is not surprising that for the twelvemonth they contrast very unfavourably with late years; which, however, it must be borne in mind, were periods of very remarkable expansion.

HOME DEMAND FOR WOOLLEN GOODS.—The activity noticed in our last report has been fully maintained throughout the whole of the present year, and has been still further stimulated under the influence of an early and abundant harvest, consequently the population employed in this important branch of manufacture have been better off than most of those engaged in other departments of our staple industry.

EXPORT OF WOOLLEN GOODS.—The late panic was severely felt in this branch of our trade, limiting the demand in all markets abroad, while the reduced exports have greatly aggravated the distress in the shipping interest, and as the crisis was the most severely felt in the United States, which is our best and largest customer, the falling-off in shipments has been chiefly to that quarter. The revival in trade was more gradual there than with us, but as business is now established on a sound footing, we look with confidence to an expanding trade to that and all other markets.

CONSUMERS.—Their position during the early part of the year was attended with great difficulty, but they stood their ground well. Since the clip they have had to contend with a continuous and considerable rise in the value of wool, without, as generally happens at such times, being able to obtain a cor-

responding advance in yarns or manufactured goods; but those who were able to take a far-sighted view of the question, and supplied themselves liberally while wools were obtainable at moderate rates, must have done a profitable business. It is with great pleasure we refer to the very marked improvement which has manifested itself during the last few months in the *Bradford district*, so long suffering from prostration, which has now resumed its wonted appearance of busy activity. In the *fine clothing* trade a steady business has been done, and from the caution exercised, there has been no accumulation of goods, so that on the whole the course of trade has been very satisfactory. The same remarks may for the most part be applied to the *flannel and hosiery* trade. On the other hand, in the *blanket and carpet* districts, we regret to say that the state of business has been very discouraging during a great part of the year, and they have suffered in a particular degree from the interruption in our export trade, chiefly with the United States. Matters are certainly looking better now, but we fear it will still be some time before we are able to report any very decided improvement.

WOOL TRADE.—In our last annual report we expressed a strong opinion that this branch of business was, in itself, in a sound position, nevertheless it could not fail to suffer from the consequences of the general crisis; and although for a long time business was almost at a standstill, in the absence of excessive supplies, either of home or foreign and colonial, and no undue pressure on the part of holders to force sales, prices remained unusually pretty well supported for some time. We are happy to state that very few failures occurred; these were fortunately confined within a narrow circle in the manufacturing districts, and more or less involved in speculative transactions with two concerns in London, engaged as dealers in English wools, who had also suspended payment. The liabilities of these firms being both very considerable, and their operations very complicated, exercised a most unfavourable influence on the whole trade; and, there being considerable delay in realizing the stocks of wool, it was near clip time before the chief part was disposed of, and the unusual course of forcing off a large quantity of wool by public auction at this period had more influence than under ordinary

circumstances would have been the case had the amount been ten times as large; the result was none other than was to be expected, but the extreme lowness of prices, so far from giving any confidence, only tended to confirm the exaggerated opinions in some quarters entertained as to the rates likely to rule at the clip; in the meantime, the market for both home and foreign was kept in complete suspense, and any sales that took place were at the lowest possible point. As the wool trade was the last to feel the effects of the crisis, so also it was the first to show signs of vitality, and as soon as home wools were in the market, the trade having driven themselves very bare of stocks, there was a complete rush to secure them, which, consequently, opened at a fair advance upon the previously current rates; this at once induced growers to raise their pretensions, and a considerable advance was soon paid. The same activity has prevailed ever since and we scarcely remember any former period when the *advance* has been more decided and continuous, a result brought about altogether by the legitimate requirements of the trade, without any excitement of speculation. It is now at least quite apparent that the growth of home wools is altogether inadequate to supply the increased *power of consumption*, leaving out of the question the number of new mills started within the last few years. We pointed this out strongly as far back as in 1853 and 1854, and have referred to it in our successive annual reports since. It cannot be doubted but that for the late panic English wools would have reached most extravagant rates last spring, and it may appear strange that, notwithstanding the ordeal the trade has since passed through, prices should now be in many cases nearly as high, and even higher, than before that period: this being the case thus early in the season, and taking into account the existing scarcity of the raw material, together with the cheapness of food and the low rate of money, there is little room to doubt that before *next clip*, in the ordinary course of events a very high range will be established.

WOOL IMPORTS.—Under almost every head there has been a very considerable falling off in receipts. We cannot at all satisfactorily account for this in the case of foreign; for, notwithstanding the unsettled state of trade during a great part of the year, the position of our markets has at least been as little discouraging as in any other quarter: at the same time we must admit that the prospects for low foreign wools generally have been far from encouraging, and imports have in nearly all cases resulted in heavy losses. It is chiefly in these kinds that the deficiency exists, and we come to the conclusion that considerable stocks must still remain on the other side; but their destination will, no doubt, greatly depend on the prospect of remunerating prices. We have scarcely ever known the market so bare of supplies. All current qualities meet with ready sale at advancing rates, but there is still very little disposition to operate freely in other descriptions.

WOOL EXPORTS of foreign and colonial have greatly diminished. In the case of fine colonial this is accounted for by the requirements of our own trade having absorbed a larger quantity than usual, and they have, consequently, been worth more in this country, while the state of trade on the continent has been more slow in recovering, particularly in Germany, where the demand has been scarcely equal to their own domestic growth. As regards foreign our markets have seldom offered much general selection, and the stocks would have been inadequate to meet any considerable demand; which, however, has never existed. We do not consider that our reduced exports are so much the result of large direct receipts on the continent as the consequence of the more circumscribed demand there arising from depressed trade; and, as a proof of this, from time to time wools have been re-shipped to this country. In British wools there has also been a large falling off, and all kinds of combs are still ruling at much higher prices here than elsewhere.

AUSTRALIA.—The import for the year exhibits only a small increase, and confirms the opinion we have frequently before expressed, that the growth of wool in these colonies has received a decided check; which is very much to be regretted, as these descriptions are peculiarly suited for our home manufacturers, and the demand has been each year increasing on the continent. The general condition of the last clip does not afford an opportunity for favourable comment, the most important feature being the increase of

burr both in the Sydney and Victoria districts. There has also been a great increase in the quantity sent home in the grease, which has, no doubt, arisen from unavoidable circumstances, but we do not by any means consider this objectionable, although *washed* wools are generally in more favour with the *home trade*; this is a point on which we must allow the *growers* to be the best judges, and as far as opportunities permit they will, no doubt, send the wools in such condition, as from experience they find to yield the best results. New Zealand wools continue to show the same healthy growth, and are, in consequence, much appreciated. The receipts of Australian *at this port* have been less than in the previous year, having been 16,015 bales, nearly the whole of which has been sent forward for the sale to London. As long as the importers there show a decided indisposition to avail themselves of this market it is useless to contend against it, and the Liverpool interest in this branch of the trade is comparatively very small; but it only requires to make a fair trial, not on too small a scale, and the advantages of this port would soon become apparent. The "Black Ball" and "Eagle" lines of clipper ships having been united under the able and energetic management of Messrs. James Baines and Co., and Mr. Thomas Mackay, of that firm, being now on his way to the colony to complete arrangements, affords the best hope that every encouragement will continue to be given to shipments to Liverpool. The first series of the season of fine Colonial took place in London from February 25th to March 13th, consisting of 36,000 bales, including 16,000 bales Cape; the quantity was less than at the corresponding sales of the former year, but exceeded the estimates previously formed, which circumstance, owing to the extreme sensitiveness of the trade at that period, operated against the advance which was established at the opening sales, and on the average the rates were about the same as at the close in December, 1857. The second series lasted from the 29th April to the 29th May, the quantity being 68,000 bales, inclusive of 9,400 bales Cape; a considerable decline had been expected, which was to some extent realized at the commencement, prices being fully 2d. per lb. lower on the average, which, however, was partially recovered, and as there was good competition for superior flecks the value of these almost reached previous rates. The third series, from the 15th July to the 24th August, comprised 77,500 bales, including 10,000 bales Cape. The prospects of business had by this time considerably improved, and notwithstanding the large quantity, these sales opened with spirit at a fair advance; and while they proceeded this feeling was further strengthened by the influence of an early and abundant harvest, and an average advance of 2d. per lb. was established; French buyers operated freely, particularly in best Australian, but very little was taken for other Continental Markets. The fourth and last series of the year commenced on the 4th of November, and terminated on the 1st of December, the quantity being 53,800 bales, including 20,700 bales Cape: great spirit was manifested, and prices showed an unusual degree of uniformity throughout, closing firmly at an advance of fully 3½d. per lb., being as high as before the panic for all good current qualities. The Home Trade were again the chief purchasers; there was a fair competition for France, but they were unable to pay the prices; while for Belgium and Germany the quantity taken was altogether insignificant.

CAPE OF GOOD HOPE.—This description continues to gain in public estimation, and these colonies are evidently destined to take a high position from their peculiar adaptability for the growth of fine wools, particularly of fair useful qualities, and the extent to which it may be carried seems almost without limit. The rising colony of Natal appears in particular to offer a wide field to the enterprising colonist, there being an abundance of open country well suited to pastoral purposes. A great portion of Cape wool is open to the objection of being of a flimsy character, to obviate this a constant and judicious infusion of fresh blood is necessary, and, if not available in the colony, no expense should be spared to procure the same from Europe.

GERMAN continues to attract less attention every year, but the receipts have been more than double the previous twelve-month. Perhaps no country suffered more than Germany by the American crisis, from which it has been slow in recovering, and this has not only curtailed the operations in our wool markets for that quarter, but also induced the increased exportation referred to.

SPANISH AND PORTUGAL.—The supply of the former has been very limited, but some sales of Leonesa have been made lately at prices which we think ought to encourage importations; and there is also a good prospect for good Segovia, Caceres, and Estremadura, provided they arrive during the next three months. Oporto shows a considerable diminution from the previous year, when the demand for American led to large importations of unwashed wools. During the last four months washed fleece has been in good demand, at prices in proportion to the advance in English combing wools. The lower qualities have also gone off freely, although at a relatively less advance.

UNITED STATES.—The imports of domestic fleeces referred to in our last, although disposed of at fair prices, met with but little appreciation either in this country or in France, where they were also fairly tried, owing to their imperfect condition; and a portion was subsequently bought for re-shipment. Early in the year we received some quantity from thence of fine colonial, low foreign, and East Indian and Scotch wools, a portion of which, and of some previous arrivals, was disposed of at most ruinous losses, but some quantity still remains, chiefly East India. There is a little uneasiness on the subject of the "Tariff," which may affect the present free importation of low wools; but if the change involves a moderate *ad valorem* duty on all wools, we think, in the end, it will prove advantageous.

BUENOS AYRES AND RIVER PLATE.—The best flocks continue to show evident marks of improvement as regards breed; which could not be otherwise, considering they are constantly receiving fresh addition of the choicest stock, both from this country as well as from Silesia, and the imperial flocks of "Ramboulli," selected regardless of expense. It is only justice to notice the care, in many cases, displayed in the classing of the wools; and we are happy to be able to add that the prevalence of burr was not so general in last season's imports. But during the greater part of the year these wools were far from enjoying the attention which we think the improved management justly merited; and it is only of late that they have been more sought after, and they are now in a fair way of coming again into favour, particularly with our home trade. The prejudice against this class of wool, on account of the burr, must soon subside, particularly as this is so much on the increase in Sydney wools, and even in those from the district of Victoria. The reason that the same objection does not exist on the continent is, that the burring machines are in general use there, and perform their work very effectually. We have lately had an opportunity of seeing some of the best machines at work on the continent, and found that they were either English invention or had been improved upon in this country, and so far from presenting novelty, the same machines are obtainable here at less price. The foreigners make comparatively light of the burr; but, of course, the price of the wool must be regulated by the loss in weight and the enhanced cost in cleansing it. The inferior qualities of Mestizo, both washed and in the grease, have been very difficult of sale; they are in demand at present, but we have no confidence in recommending the import of this description, as there is scarcely an opportunity during six months of disposing of them without the unsatisfactory recourse of forced sales. We have received a fair quantity of Cordova, which has been salable at market value.

PERUVIAN AND ALPACA.—Sheep's wool has not met with very current sale, except the finer qualities; through forced sales the market has been kept constantly unsettled, and the business has, for the most part, been confined to speculative operations. Alpaca: Although there has been a small increase on the light import of the previous twelve-month, still it has been much below an average, which we were quite prepared to expect. The transactions that have taken place have been mostly at a decline of nearly 1s. per lb. upon the prices existing before the panic (and in some cases even much more), but without directing general attention to this article, which we attribute in a great measure to the lightness of stocks during the greater part of the year, and, consequently, the attention of manufacturers has been directed more to English wools and Mohair. There being now a fair supply on hand, and the impediments to shipments no longer existing, we look for a speedy revival of demand, owing to the healthy and buoyant state of the Bradford trade. A reference to the prices of Alpaca, Turkey goat's wool, and English combing wools

(middle wethers), at the three following periods, show a very striking contrast:

	Alpaca.		Turkey Goats' Wool.		Middle Wethers.	
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Sept. 1857, before the panic	3s. 2d.	to 3s. 4d.	2 6	to 82	1 5	to 1 5½
May 1858, English Clp time	(3s. 2d. paid.)		2 3	to 3 5	1 1½	to 1 2
Dec. 1858, present value	2s. 3d.	to 2s. 6d.	3 0	to 3 ½	1 6¾	to 1 7

and we may further add, that Alpaca has before invariably ruled at a much higher price than Turkey goats' wool.

EAST INDIA.—For some years we have recorded a rapid and continuous increase, which has, however, for the present time met with a check in the past year. This can create no surprise, considering the very unsatisfactory prices that have prevailed during the whole of that period, owing to the depression in the blanket and carpet districts, consequent on the suspension of business with the United States. This description had also to contend with the low prices that have been ruling for English short skin wools, and as there are "fellingomering" establishments nearly all over the country, consumers have met with ready sellers close to their own doors as usual at such periods. It will be seen that the receipts continue to be directed almost entirely to this port, and as we do not possess the East India trade exclusively, as is the case in London with the Australian trade, we think this may be taken as a free indication that ours has been found the best market. We do not think the present depression in value of East India wool will be of very long duration, and at our next public sales in January we look for some improvement. During the last season there was a very large proportion of inferior uncurrent kinds, which sold ruinously low, and had also the effect of reducing the value of better qualities, which have, however, uniformly commanded higher proportionate value. If proper attention is paid on the other side in carefully preparing these wools, we are very far from taking a discouraging view of future prospects. They are a description most essentially requisite for our trade, and each year will open up a wider field for consumption.

CHINA has met with fair inquiry, but from the limited supply the transactions have not been worthy of notice.

RUSSIA.—There has been a very considerable falling off in receipts, compared with the previous year. Donskoi wool has not been in much favour, and from the unusually large proportion of inferior fleece, and the desire from time to time to press sales, prices have ruled low, and it is only quite lately, since these objectionable qualities have been cleared off, that any marked improvement in value has taken place. A great portion of next season's shipment has already been secured for other countries; and, as the proportion of good combing parcels is said to be much less even than usual, there is reason to expect that such kinds will bring their full value, prices being still very much lower than last year. Autumn and other low qualities have not met with general inquiry. In fine scoured and brook washed the transactions have been unimportant, but our market at present offers a very encouraging prospect for this description.

MEDITERRANEAN.—These wools have not engaged any attention, and consequently the receipts have diminished considerably; there has been more inquiry of late, but there is scarcely any kind that could be imported to leave any profit.

EGYPTIAN continues to take a high rank as the most favourite of all foreign wools of this class, but it is still open to the objection we have so frequently pointed out, of being mixed with inferior kinds, which detracts very much from its merits. Fine bred parcels are of very current sale, and with improving prospects.

TURKEY GOATS' WOOL OR MOHAIR has engaged particular notice, and so great has been the eagerness to secure supplies, that they have been chiefly bought long before arrival, and prices have consequently advanced considerably, having reached a point much higher than ever known before. Some beautiful designs have been produced this season, which have had a "great run," quite casting Alpaca goods into the shade for the time.

ICELAND has been in good demand, but sales having, in many cases, been pressed with some precipitancy, had an unfavourable influence; no sooner, however, was this pressure removed than the market assumed a firmer tone; and although the advance from the lowest point is greater than in nearly any other description, they are still much below the highest rates of last year; and, the remaining stock being chiefly composed of good descriptions, is held at full prices.

BARBARY continues to show greatly diminished receipts, partly arising from the Emperor of Morocco having prohibited the export from his dominions, which is to be regretted as current qualities have generally been in favour. The loss of other kinds, excepting good clean Tunis, has not been at all missed, as there is generally a strong prejudice against them in this country.

DOMESTIC WOOLS.—From various circumstances, a short time before the clip, prices were forced down to a point which subsequent events proved was not at all warranted, but no sooner were the new wools fairly in the market than a sudden rebound took place, and we have never known a time when the advance has been more rapid or more firmly sustained, and while prices have been remunerative to the grower, they have also been profitable to both dealers and consumers. In some cases they have advanced 50 per cent. from the lowest point,

and are now even higher than before the panic. Stocks are very moderate, and from the extraordinary demand for lustre wools in particular, present rates are not only likely to be fully maintained, but the most extravagant expectations are in some quarters entertained as to the course they are likely to take before the new clip. *Irish* has shown the same buoyancy, but very little stock remained at clip time, and no forced sales took place. The French have not operated so freely as usual, but more has been taken for home consumption, and the supply is very moderate for the period of the year. *Scotch* wools have not been in much request, and laid Chavot in particular has been very much neglected, but has been more sought after of late. Laid Highland has met with more inquiry, but the demand has been far from active, the stocks, however, being very light at present, and in the absence of similar qualities of low foreign there seems a reasonable prospect of higher prices, as they are still very far short of last year.

SHEEPSKINS have been rather difficult of sale, except the better qualities heavily woolled in fair condition, but there has been a more general inquiry of late for all descriptions; a considerable clearance has been made, and sales can now be freely effected.—HUGHES AND RONALD, Wool Brokers.

Liverpool, Dec. 31, 1858.

REVIEW OF THE TRADE IN MANURES AND OIL-CAKES DURING 1858.

A review of the manure trade of the past year presents it in a similar aspect with other branches of commerce, although the causes which have led to the depression in this department are of a different character. The high prices farmers had been getting for their produce, together with the scarcity of guano, led them to use artificial manures during 1857 to an enormous extent, and the demand for all kinds of fertilizers in that year was quite unprecedented, driving up the prices of raw material very considerably. Manufacturers naturally expected a similar amount of business last spring, and provided stocks accordingly. As the season advanced it became evident these anticipations would not be realized. The heavy fall in grain, and in the autumn the failure of the root crop, rendered farmers unwilling to part with their money throughout the year. Such a course is clearly false economy, and it is to be hoped practical agriculturists will understand their own interests better in future than to think of starving the soil by depriving it of the very means necessary to render it productive. It is not by parsimonious cultivation, but, on the contrary, by a liberal expenditure on his land that the British farmer can hope to hold his own in these times, when he has to encounter competition from so many quarters.

However, the result is, that heavy stocks of manures are held by makers and dealers all over the country. It is true those parties who have always maintained a reputation for supplying genuine goods have not suffered from the contraction of business in any measure so severely as others of doubtful character.

If really good articles have been dull of sale, inferior and worthless could scarcely even be sold at all.

Probably in no year has so great a quantity of rubbish been passed upon consumers as in 1857. A better state of things prevailed last season, and such parties have themselves been great sufferers, from the impossibility of getting rid of their stocks. No doubt every means will be used to pass off these stocks in the course of the coming season, and consumers should therefore be cautioned to send their orders only to firms of known standing and respectability. Price is no criterion of quality; for whilst on the one hand bad manure is offered at very low, on the other hand it is sold at extravagantly high prices.

IN SUPERPHOSPHATE OF LIME I am disposed to look for a good steady trade during the approaching season; and any further reduction in Peruvian guano is not likely to have much effect upon the trade if it should take place, the superiority of superphosphate over guano for root crops being now pretty generally acknowledged.

GUANO of all descriptions has been imported largely during the year, and the stock of Peruvian in London at the present time

is far greater than at any former period, being very little short of 300,000 tons; but owing to the high price placed upon it by the agents of the Peruvian Government, the consumption has, in almost every district, fallen short of that of former years. At the close of the turnip-sowing season, however, the price was reduced £1 per ton; but a far greater reduction must be made to meet the ideas of agriculturists, with the present low prices obtained by them for their produce. Very little of second quality guano has been used. A few cargoes of a recent discovery from the Island of Sombbrero have been introduced lately to the notice of artificial manure manufacturers, with the idea that the phosphate of lime it contained would form a basis for their superphosphate; but after a few trials, they have not found it so useful as bone-ash and coprolites, which are now to be obtained at a very much less price, their relative values being taken into account.

IMPORTS OF PERUVIAN GUANO INTO THE UNITED KINGDOM.

1855*.	1856.	1857.	1858.
305,061	191,501	288,362	312,000 tons.

The prices of raw material have varied considerably throughout the year.

BONES at the beginning were selling readily at £5 15s. to £6 for foreign. In June, the prices had fallen to £4 15s., and at this low rate a good deal changed hands. Towards the end of the summer considerable purchases, principally of London bones, were made for France; and the stocks here being low, the market was soon cleared. A rise taking place in consequence, and the quantity on the way from South America being small, some manufacturers, anticipating a further advance, commenced buying for their 1859 consumption, and a brisk trade was done at high prices, say £5s. 10s. net for London bones. At this period it was extremely difficult to get foreign, every cargo being sold as soon as offered on the market. £5 15s. was the highest figure obtained in this port, but in Hull as much as £6 was paid. In October the excitement abated, and a fall took place; a few parcels of foreign, not of the best sort, having been sold at £4 10s. to £4 15s. in the docks.

BONE ASH selling at £6 7s. 6d. to £6 10s. for 70 per cent. Phosphate in the early part of the year fell to £5 7s. 6d. to £5 10s. about the end of May, but shortly improved in value, and by the middle of July had advanced to £5 15s., at which price all the cargoes that offered were quickly disposed of for out-ports. In the autumn a heavy decline took place, and the

* The imports in 1855 were greater than in any previous year.

article was a drug; last month, however, a few cargoes were sold, and a better feeling sprang up. Owing to a fall in the value of leather, compared with the prices ruling during the Russian war, the number of Beasts slaughtered in the South American States was very much smaller last year. There can be no doubt it is owing to the limited imports of bones and bone ash from that quarter, arising from this cause, that the decline in value of these articles has not been far greater.

ANIMAL CHARCOAL has varied from £6 5s. to £5 for 70 per cent. phosphate. The consumption seems to be diminishing, perhaps owing to the uncertainty as to the quantity of carbonate of lime the analysis may show. For Spring delivery £5 5s. is asked.

COPROLITES had a brisk sale throughout the season, at from 70s. to 75s. per ton, for ground Cambridge. This article has since shared in the general depression, and has receded to 60s. The quantity raised is large, and very little is selling; but the principal raisers are not likely to give way, and possess the means to hold their stocks.

In all the foregoing an advance may be confidently looked for. At the present time no business of any consequence is doing, but as the season comes on, and manufacturers who have been holding out for still lower prices are forced to buy, the trade will receive an impetus.

The BRIMSTONE market has experienced almost as great fluctuations as in 1857. About Christmas in that year, in consequence of a combination in Sicily, prices advanced from £8 to £8 10s. on the spot (for best seconds). In the month of January following there was great speculation in the article, and stocks in Newcastle, Bristol, and Liverpool, being exhausted, purchases for those markets were made in London, and the price rose to £10 10s., at which it remained until April, when a decline of fully 25s. took place, owing to large arrivals and diminished consumption. From June to September the markets varied from £8 12s. 6d. (being a further fall) to £9 5s. (highest price). In the latter month a fall of 15s., and in October of 10s., occurred. In the early part of last month sales were made as low as £7 5s. on the spot, until a large purchase in Sicily caused a gradual recovery to £7 15s. On Monday last, news from Sicily sent up the price to £8, and the present quotation is £8 to £8 5s., or for cargoes C. F. and I., £7 15s., at which figure two have been sold to a speculator this week. The nominal price in Sicily is £7 on board, and the stock in the port is very limited. In no article have there been greater fluctuations, during the past two years, than in brimstone. The speculation is great, and it is impossible to speak with any degree of certainty as to future prices.

SULPHATE OF AMMONIA brought £20 in January, and in

the following month declined to £19, after which it fell steadily to £15. The market then continued in a very depressed state for a long period, and there were no buyers to be met with. Sales were made of best white as low as £14 in the early part of August, but orders arriving from the United States caused an advance to £16. The large manufacturers made every effort to force the market higher, but the Autumn trade being small, it has slightly receded. I think this article will be rather dearer in the Spring.

NITRATE OF SODA fell from 19s. in January, to 15s. in November. An improvement took place last month. Stocks are very low, and the quantity afloat offering is small. The market is very firm at present quotations.

In SULPHURIC ACID a fair trade has been done. Prices continued firm at 63d. and 1d. per lb. for brown and concentrated respectively, with a discount of from 2½ per cent. to 5 per cent. until July; when, the consumption falling off, a reduction took place, and in August sales were made at 17½ per cent. discount.

Sulphur-made OIL OF VITRIOL is rather dearer now, and higher rates may be looked for.

OIL SEED CAKES.

LINSEED CAKES have not been imported so freely during the last year as in 1857, more especially Baltic and French descriptions. From America we have had about an average. Prices at the commencement of the year were about the same as those now ruling, although in the month of September, owing to the general unsatisfactory prospect of the root crops, prices gradually rose, and barrel cake was sold as high as £11 5s. per ton, and bag cake £10 15s. per ton. Since then feeders have brought largely into use both wheat and barley, and prices have gradually declined. The stock of cake is small for the time of year, and a rise may, I think, be looked for as soon as the articles brought into competition with it run short.

RAPE CAKES of good quality have been largely dealt in, both as a measure and for feeding, and throughout the year have commanded full rates.

COTTON-SEED CAKES have not had as much attention paid to them as they deserve; they have, however, been extensively used in the Eastern Counties for feeding, preparatory to placing the cattle on linseed cake. I consider the description imported from America, crushed, with the husk taken off, although £2 per ton higher in price, much cheaper than that made from East Indian seed, which is crushed leaving the husk in the cake.

35, Leadenhall-street, London, Jan. 1. JOHN KEENE.

THE PRESENT POSITION OF AGRICULTURE.

The present position of the farmer is doubtless one of some anxiety. Seldom has the New Year opened to him under less encouraging auspices. The clouds, indeed, appear to be gathering together over his head, and he must quickly decide how and where he shall seek for shelter. It may not be more than a passing shower; but it is as well to be fully prepared. Let him look about him, and see what he might suffer from a continuance of "bad weather;" how the crops and flocks are protected; and what will be his best way of proceeding, with the road to market not quite so easy as it has been. Of course one of his first cares will be to go over his expenditure, and to ascertain to what extent any reduction is possible. Farm well he knows he still must; but these are anything but the days to farm over expensively. In fact, as some say, the time of trial is only just dawning upon him; the storm, that we thought had blown over, is again thickening, and it really looks darker than ever.

Peculiarly well-timed to the occasion, the new number of the Highland Society's Journal has an article, from the pen of "A Farmer," on the present

position of agriculture. This paper, too, has something more than the mere merit of being opportune; it is written with ability and fair consideration of the important topic it touches on. Let our present purpose be to show how the agriculturist is now situated, concurring very much as we do with the argument and deduction upon which such a demonstration is made. In the first place, then, the farmer meets the change with two very serious points set dead against him. Despite the continuance of low prices—notwithstanding the small promise of sunshine on the horizon, the two heaviest items in his outlay are as high as in the high range of a few years back. It is almost as much a favour as ever to get the offer of a farm. There are twenty applicants ready to bid for it. Political economists turn with triumph to the fact, while landlords and agents are naturally willing to make the best of their market. The labourer, again, is anything but inclined to fall back upon that condition once so directly associated with wheat at a low figure. War and emigration have alike tended to thin his ranks, and if a man does run after a

farm, he as assuredly at certain seasons has to run after servants for harvest. This is a peculiar and unprecedented state of things. The three classes no longer rise or fall together, but one of them finds all the burden on his own shoulders. He stands, as it were, alone, without any of that estuary sympathy from the others, who, acting altogether independently of him—maintain only their own rights and privileges. What, ever the farmer may have lost in the last year or so, neither landlord nor labourer have so far experienced anything like equal reverses.

The recipe is, on the whole, a somewhat startling one. Obviously the first means of reducing the employment of expensive manual labour is in the increased use of machinery. We live in the very age for the ready adoption of such a substitute. But our northern friend couples with this an equally decisive step to counteract the effects of the times. If labour is high have less of it; and if corn is low, grow less of it. One, indeed, would directly tend to the other. We repeat, however, that this sounds rather strangely with the necessity for increased production of which we have heard so much of late. But it is put and repeated with much emphasis:—"We have no hesitation in saying that, if present prices of farm produce and present rates of wages continue, farmers will be compelled to reduce the demand by throwing more land into grass, or using more machinery on their farms." And again:—"The course of the arable farmer is clear—he must raise less corn, which is not so profitable now, and, throwing more into grass, resort to the dairy or the rearing of stock. By this means, too, he will reduce his labour account, which is the great difficulty he has to contend with, swallowing up all his profit." As to farms recently let at extravagant rents—this, even in the face of the fancy for them by amateurs and merchants, is an evil that must soon correct itself. "Even the most energetic and skillful management will scarcely produce a satisfactory balance sheet;" and "we do not claim any credit for foresight when we predict an approaching crisis in the agricultural interest."

It has been often our duty to expose the utter fallacy which would attribute the more recent welfare of agriculture to any legislative enactment. This, on the contrary, has arisen almost entirely from a combination of circumstances of which the most far-seeing of politicians had not the slightest idea. In those lengthy debates on the corn laws, did friend or foe for a moment contemplate such events as the discovery of the gold fields, the consequent emigration of our people to flourishing colonies, or their employment in more than one great war? With such incentives and customers farming could not but do well; and many thinking men agree with the writer of the paper we have referred to, "that the great experiment of free trade on British agriculture is only now about to be tried." So far, its influence has been of a very negative character, and those who promised prosperity or prophesied ruin have alike but little to take credit for. The test is yet to be applied. "We ask farmers to exercise their own judgment in the case: let them turn to their books, and see what years, during the period from 1850 to 1857, have been the most prosperous. We allude of course here only to arable farmers. They will find, doubtless, that the end of 1853 and 1854-55—and in some parts of the kingdom where the harvests were favourable, 1856—were their best years. Now, free-trade existed during these years; but it existed also during 1850, 1851, 1852, and it exists now; and why is there such a difference in the circumstances of the farmer in these last-mentioned years and in the former, as indicated by his books? It will be recollected that during the summer of 1853, negotiations were going

on with Russia; and that, as the year wore on, the relationships between the negotiating countries became more and more critical, till the climax was reached in the spring of 1854, when war was proclaimed. It raged with fury till the autumn of 1855, when it may be said to have been virtually concluded; but the effects of it in high prices continued for some time after. Surely no one will deny that the principal cause of the prosperity of the farmer during these years was the Russian War."

It will be said that this view of the present condition of agriculture is not a very sanguine one. It is taken, however, by a man who evidently feels his ease, and who argues rationally and dispassionately. Just at present the whole burden is on the farmer. The public generally are prone to think only of his flourishing times and rarely inclined to make any allowance for his reverses. But landlords, we hope, will not be led away from the actual facts, even though they still for a while may command high rents and ready tenants. Let them remember how this competition has arisen, or rather yet continues—"from merchants and others who, having made money at their business, entering the lists of offerers for farms, and carried away by the wild statements of some enthusiasts of what science can do for agriculture, and as to the present laggards of farmers." But laggards those who know them best know they are not. Never has the cause progressed so much as during the few past years. It may be maintained, on this, that they should now be able to face and withstand some little adversity. As it is, they have manfully withstood much already. And if, moreover, recent legislation is still an experiment, we are quite willing to allow the cultivators of the soil are better prepared to receive it than on its first introduction. Their prejudices have worn down, and they are both better in heart and in head. They cannot, however, continue with present prices thus in every way against them. There must be relief from some quarter. Either they must expend less in labour, and more in machinery, or the price of produce must again rise. Above all, however strong the landlords may feel in their own position, let them not withhold their consideration till it is too late. The interests of the two classes are altogether identical, and in any time of difficulty it is the great duty of one to think how he may assist and encourage the other.

GRAIN PRICES FOR THE LAST 15 YEARS.

Sir,—It may be interesting to note the average prices of wheat, barley, and oats during the last fifteen years; and the following table, based on official returns, will illustrate the great fluctuations to which agricultural produce has been subjected in this period. The calculation refers to the twelve months between the 1st of December and the 30th of November in each case:—

Year.	AVERAGE PRICE OF					
	Wheat.		Barley.		Oats.	
	s.	d.	s.	d.	s.	d.
1844.....	51	3	33	6	20	4
1845.....	49	10	31	10	22	4
1846.....	54	5	31	9	23	5
1847.....	70	5	45	3	29	1
1848.....	50	2	31	5	20	9
1849.....	43	6	28	2	17	8
1850.....	40	3	23	8	16	4
1851.....	38	8	24	6	18	6
1852.....	40	3	28	3	19	1
1853.....	50	11	32	11	20	5
1854.....	72	5	36	5	27	8
1855.....	73	11	34	2	27	6
1856.....	70	10	40	11	25	5
1857.....	57	4	42	8	25	1
1858.....	44	10	35	0	24	6

The relatively high prices still maintained by wheat and barley will not escape attention. Z.

THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND.

The half-yearly meeting of this Society was held in Edinburgh on Wednesday, Jan. 19, the Duke of Atholl in the chair. There was an unusually large attendance of members, between seven and eight hundred being present. The business commenced with the election of a hundred and eighteen new members, and that of the secretary followed. The re-election of Mr. Hall Maxwell was proposed by Mr. Hope Johnstone, seconded by the Duke of Buccleuch, and ultimately carried by an immense majority, there not being in so large a meeting above some thirty or so against it. A proposal of Sir William Johnston to put at the same time with the election of the secretary a motion for a further inquiry into the resignation of Mr. Lawson as seedsman to the Society, and into the dispute between the seedsman and the secretary, was withdrawn, and this matter subsequently considered as a separate question. Its discussion was attended with some unpleasant personality, as well as with great warmth, much confusion, and really at times the chances of a serious disturbance. A variety of motions, amendments, and explanations were offered; the Duke of Buccleuch, Lord Rosslyn, Lord Panmure, Sir George Clark, Sir William Johnston, Sir Thomas Gladstone, Mr. Caird, M.P., Mr. McLaren, Mr. Beveridge, Mr. Monteith, Mr. Lawson, and others taking part in the proceedings. Finally, an amendment proposed by Sir Thomas Gladstone, and seconded by the Duke of Buccleuch—that the word “retractation,” which had been used by the Directors in reference to the issue of Mr. Lawson’s pamphlet, should be expunged, and the word “withdrawal” substituted—was put and carried. The original motion, proposed by Mr. Caird and seconded by Lord Panmure—that Mr. Lawson’s resignation be not accepted, but that he be reinstated as honorary seedsman to the society, disjoined from the office of Curator to the Museum—was then put and negatived. Lord Panmure afterwards demanded a poll, and a scene of great confusion took place. Many, however, had left when this occurred, and the meeting was ultimately adjourned to that day fortnight—Wednesday, February 2. We postpone any fuller report of this untoward affair until it shall have been disposed of at the adjourned meeting. Surely the exercise of a little good sense and kindly feeling may save the Society from another such a day. As the Duke of Buccleuch very justly complained, the re-issue of Mr. Lawson’s pamphlet should never have been suffered; while this has been followed by an anonymous attack, so personally offensive as calculated, in the opinion of the *North British Agriculturist*, to defeat its especial object—viz., the discomfiture of Mr. Hall Maxwell. To us, however, it appears to be not merely an attack on the Secretary, but an equally unwarrantable insult to almost every nobleman and gentleman who has taken any active part in the proceedings of the Highland Society. The fair fame of Mr. Lawson requires that he should give the most thorough contradiction to his having been in any way consulted on, or committed to,

this discreditable production. A variety of other business which stood on the agenda had necessarily to be postponed to the adjourned meeting.

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, 1858, published by authority in the *London Gazette* of this evening, viz. —

	s.	d.	
WHEAT.....	7	4	per imperial bushel,
BARLEY.....	4	5½	ditto,
OATS.....	3	0½	ditto,

I beg to state for their information, that each £100 of tithe rent-charge will, for the year 1859, amount to £108 19s. 6¼d., which is a little more than 3 per cent. above the 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	9¼
1838	97	7	11
1839	95	7	9
1840	98	15	9½
1841	102	12	5¼
1842	105	8	2¾
1843	105	12	2¼
1844	104	3	5¼
1845	103	17	11¼
1846	102	17	8¾
1847	99	18	10¼
1848	102	1	0
1849	100	3	7¼
1850	98	16	10
1851	96	11	4¾
1852	93	16	11¼
1853	91	13	5¾
1854	90	19	5
1855	89	15	8¾
1856	93	18	1¼
1857	99	13	7¼
1858	105	16	3½
1859	108	19	6¼

23) 2,287 2 0¼

General average for 23 years £99 8 9¼

I am, Sir, your most obedient servant,

CHARLES M. WILlich,

Actuary University Life Assurance Society.

25, *Suffolk-street, Pall Mall East, S.W.*

7th January, 1859.

NEWCASTLE-UPON-TYNE FARMERS' CLUB.

The annual meeting was recently held in the new Club Rooms, being the first occasion on which they had been open for the use of the Club. These, both as to site and accommodation, are admirably adapted for the purpose. They form part of the New Town Hall Buildings, and the entrance to them is directly opposite the door at the north end of the Corn-market on the other side of the passage which runs across the upper end of the building. The first room is devoted to the use of the members for business meetings, &c., and may be described as a Farmers' Exchange. The inner room is appropriated to the Library, and is adapted for the meetings of the Club. Both rooms, which are on the ground floor, and look into the Groat-market, are most handsomely and substantially furnished; in rooms above are lavatories and other conveniences; the whole wears an air of comfort, and, separated as these rooms are from the Corn-market only by the width of a passage, they are calculated to afford most valuable facilities and accommodation to farmers and others attending the market who may be members of the Club, and will doubtless lead to a great augmentation of its numbers. At the annual meeting, with which the rooms were opened, Sir Matthew White Ridley, Bart., President of the Club, presided, and after a few brief words of congratulation, opened the proceedings by calling upon the secretary, Mr. William Glover, to read the report, which embodied the terms and reasons for obtaining this accommodation.

The business of the annual meeting having been disposed of, the members adjourned to the Long Room of the Crown and Thistle Inn, where a large company of gentlemen, members and friends of the society, sat down to dinner. Sir Matthew White Ridley Bart., occupied the chair, and the Hon. Henry George Liddell, M.P., the vice-chair.

The CHAIRMAN, in giving "Success to the Newcastle Farmers' Club, and prosperity to the new arrangements," said to some little extent this toast divided itself into two heads, the one partly retrospective, the other partly prospective. To deal with the former in the first instance: on looking back to the years that had passed over this society, since its first institution, twelve years ago, they saw it had done a good deal in the way of promoting inquiry and creating an interest in agricultural subjects. It was known perhaps to many members here present, many of whom had taken an active part and evinced a steady interest in the society, that the number of discussions held in their late rooms—it was known perhaps to some, though perhaps not to all—had amounted to no fewer than one hundred, on practical subjects. At most of those he was present. Some of them were confined to members, others arose out of lectures given by scientific men engaged for the purpose, and some of them were of a very able and interesting character. It was with a considerable amount of regret that he said they had not been able continuously to maintain those discussions for the last two years. Still, he felt obliged to remind them that they began with every zeal and earnestness, and, in his opinion, they had taxed the energies of their then small number of members rather too severely, inasmuch as they proposed, in the first instance, to hold those discussions monthly. Now, he believed there was no Farmers' Club existing in England which had succeeded in maintaining a discussion every month throughout

the year. There might be some; but they were decidedly the exception. In addition to the discussions which they had held, they had also done much towards collecting a very excellent agricultural library, and the use of the books had not been confined to the rooms, but the members had the privilege of taking them out. He was glad to say that a great many of these books had been extensively used, and had been in the hands of very many of the farming community. The time, however, seemed to have come when it was necessary to put the farmers' club, as regarded the public, in a better position in point of locality and convenience; and it was thought they might, with advantage to the club, and with the probability of increasing its members and of extending its sphere of utility, so place it in the town as to combine with the library and reading-room the advantages of a room for business, which should be available to the public on introduction by members of the club. They had succeeded, by the consideration and kindness of the Corporation, to whom he must say they felt themselves indebted, and especially to the committee who had charge of the erection of those buildings in which they held their anniversary to-day, and also to Mr. Wilson, who had acted for them in a great many matters in connection with this club, for the considerate manner in which they had treated the club. He trusted the Corporation would find they had got in the club a good, solid, solvent tenant. He could not help thinking that the accommodation which they now held forth to the public, namely, an outer business room, and an inner library, museum, and reading room for the club, would be a considerable addition to the conveniences already afforded by the New Town-Hall Buildings; and they were anxious that it should be made as public as possible in the belief that many would be glad to avail themselves of the opportunity of joining the club without delay. They had, he thought, now placed themselves more immediately under the public eye. They had conducted their resources, and managed them with considerable economy. He regretted to say that of late years they had been obliged to husband their resources very considerably, but at the same time they had paid their way; and upon the transactions of the past year they had a small balance to carry forward. Now, in alluding to the Farmers' Club simply as a union, a visiting place, and a place of call, or to some extent a place of business for members connected with agriculture, whether as landlord, tenant, or he might add labourer, it would be of great advantage to them to be able to transact their necessary business close to the corn-market, and without the disturbance and inconvenience necessarily arising from having to make their appointments at a distance from the market. He could not conceive any institution or associated body more deserving of support than the one which had held its anniversary that day; for they must bear in mind the great necessity that now existed for every attention being paid to the skilful culture of the soil, and the necessity of science and exertion going hand-in-hand in the practice of agriculture. And surely an association like this, which dealt simply, exclusively, and totally apart from all political considerations, with those matters which tended to the practical improvement of the powers of the soil, which was to provide food for the inhabitants of this country, an association

which had a good library, with access to a reading-room, the books of which they allowed to be taken out; and which, at some risk to the finances of the society, had taken rooms in a central position in the town, and furnished those rooms and provided them with suitable conveniences for the transaction of business—such a society, he did think, had acquired still further claims upon the active support of the agricultural community. He was satisfied in his own mind that a great deal had been already done, and he looked forward with confidence to a periodical renewal of the practical discussions on agricultural subjects, and to their being fully attended, and carefully and judiciously, and with some ability, would be entered upon. He trusted, likewise, that the general public, finding the facilities which the club placed within their reach, would be disposed to give it their support; and that both to the club and to the public frequenting the market it would be a great convenience. In connection with such an institution he felt, moreover, that it was to be regarded not only with reference to the present moment, but to the generations to follow. It was clear to him that as time went on, more knowledge and more reading was required for the farmer than before, and that this institution must be looked to as one of the means of bettering and improving the condition of the occupiers of land in this county.

The CHAIRMAN had afterwards great pleasure in proposing the health of his Grace the Duke of Northumberland. He was glad to say that in addition to much that had been said of His Grace, and which was no more than the Noble Duke richly and really and honestly deserved, there was this upon this special occasion that he might perhaps say, that he had been an early friend and promoter of this institution. His Grace did not fail to take an interest in their early proceedings, and show it by furnishing the club with a considerable number of books from his own library; he had also presented them with a picture on an agricultural subject which now graced their rooms, and on various other occasions His Grace never failed to express an interest in the well-doing of the society.

MR. ANDERSON, in returning thanks for the Vice-Presidents, said their society might be looked upon as one of the little tributary streams that went to form the great societies—the Northumberland Agricultural Society for instance, and from that up to the Royal Society, which had produced the most wonderful effects.

MR. G. H. RAMSEY spoke at some length in proposing "Agriculture and Commerce combined." He noticed the reciprocal influence of the two. Dwelling, however, more particularly upon agriculture, and tracing the progress of this club, of which he had been one of the founders, he said that they had had some of the best and most learned papers read in their club that had been read in any farmers' club in England.

MR. BELL said there had been a toast given to him, he supposed because of the position in which he had had the

honour to be placed in this county, and from the belief that he must therefore have seen perhaps as much of the tenantry of it as most men. He certainly had seen a great deal of the tenantry, and entertained for them the highest regard and respect. He conceived that their industry, perseverance, and skill, were not to be surpassed by those of any tenantry in the kingdom. However attached to the county of Northumberland, he could not shut his eyes to the fact that it had not the climate of Sussex, nor the soil of Worcestershire; therefore he must say the landowners of this county were greatly indebted to the tenantry for having brought the land to that high state of cultivation in which it now existed. The skill and ability which were displayed in farming in this county were, in fact, held in such high estimation, that young men were sent from all parts of the kingdom to study agriculture under our farmers. It would be presumptuous in him to speak of the perseverance, industry, and skill of the farmers; they had upon all occasions set an example of agricultural improvement to the whole civilized world. It was notorious that wherever the British farmer met the foreign agriculturist in the wide field of competition, he had invariably borne away the prize; and although, at this time, our love for France and Frenchmen was most astonishing, yet he had enough of the John Bull in him—although, perhaps, not the most correct representative of that personage—to think there was no country like England, and that there were no men like Englishmen; therefore, he hoped and trusted that wherever the British farmer met the French agriculturist, or any other agriculturists, he would beat them as soundly as he had always hitherto done. He regretted extremely that that great interest, which was the mainstay of the prosperity of the country, had hitherto been treated with worse than neglect by the Government of this country; for it did appear that Government considered the whole duty of man to consist in spinning cotton. The land had been neglected by them for the sake of our manufactures. Notwithstanding this neglect, such were the indomitable perseverance, ability, and skill of the British farmer, that, amidst difficulties and distress, he yet, in his opinion, was the mainstay of the prosperity of the kingdom. He was a good deal amused the other day, in taking up one of our provincial papers, to see there inserted a report setting forth the wonderful advantages that the agriculturists of the county of Northumberland had derived from the repeal of the Corn-laws. Now, whoever the facetious personage was that inserted that report, in his opinion he must have been a wretched plagiarist; for there could be no doubt that the report must have originally appeared in the columns of our laughter-loving friend *Punch*, who, although one of the most amusing of men, was not the most correct journalist.

There were a number of other toasts, chiefly of a local character.—Abridged from the *Newcastle Journal*.

SICKLES AND CYCLES.

SIR,—After reading the comprehensive and masterly review of the monetary year which forms the City Article in *The Times* of yesterday, my attention was drawn, not for the first time, to a phenomenon in the past history of the corn trade which I have never had the satisfaction of seeing noticed in any public organ, agricultural or commercial, but

which appears to me sufficiently remarkable to deserve to be known, and, if so, to occupy a small space in your columns. It is this. For no less a period than 32 years—ever since 1827—the price of wheat in this country has moved in quadrennial periods—four years up and four years down—with a regularity so steady and invariable that it is

difficult to cast one's eyes over the scale of "annals of averages" and escape the impression it conveys of a perfect natural cycle. Such a circumstance would be less surprising to any one who had studied the constancy of nature's operations, even in elements the most seemingly inconstant, were it not for the many and persevering attempts that we have seen (and happily outlived) to regulate by legislative mandates a tide whose ebb and flow has observed the same inevitable libration, unaltered and unaffected through all the multiform attempts to "regulate the price of corn," from the date of Lord Glenelg's Act, in 1823, through Peel's Acts, and still throughout the decennial period that has succeeded the abandonment of all Acts but the wise one of leaving it alone.

No expansion into verbal statement will do justice to the expressive tale which the diagram of annual prices affords to the eye. Briefly told, however, and omitting fractional figures, it is as follows: From 1827 to 1831, the first quadrennial period, the prices of wheat rose from 58s. in the first-named year to 66s. in the last. Thence to 1835 it fell by regular annual steps, 58s., 52s., and 46s., to 39s. In the next four years it rose again with equal regularity, through 48s., 55s., and 64s., to 70s. in 1839. Then down by the gradations of 66s., 64s., and 57s., to 50s. in 1843. Up again, through 50s., 51s., and 54s., to 69s. in 1847. Down again,

in turn, by the regular stages of 50s., 44s., 40s., to the figure fearful to agricultural eyes of 38s. in 1851. The next four years it mounted again by the encouraging degrees of 41s., 53s., 72s., to the Crimean altitude of 74s. in 1855; whence it has declined in obedience to the same singular law of succession to 69s. and 56s. in 1856 and 1857, and to the still lower figure it holds in the year just expired, the third, and happily the penultimate, of our present descending series.

From this statement (unavoidably tiresome and ineffective in the mere reading) any one caring to take the trouble can readily draw the diagram for himself, and observe the instructive, or at any rate suggestive, picture it furnishes. Whether in our suicidally non-statistical or anti-statistical farming world the reflections it affords will be much valued, especially at this luckless moment of prospective declension augured by it for the coming year, I may well feel some question; but I am induced to think that in the eyes of the commercial world it may find some appreciation (*quantam valeat*) as a possible approach to the disclosure of "law" in a class of prices which, under the annual title of "The Harvest," affect and underlie so many interests, and inter-penetrate so importantly the commonwealth of all. And with such view I venture, by your permission, to submit it to the notice of your readers in this and other countries.

Jan. 5.

Your obedient servant,

C. WREN HOSKYNs.

CALENDAR OF AGRICULTURE.

The ploughing of leys and stubbles will be done during the whole of this month from being impeded by frosts and snows of the previous months. Continue the carting of dung to the fields, earths for composts, and stones for drains. Thrash regularly for fresh straw for the cattle; and push forward such operations, that they may not impede the sowing season that is now approaching.

Begin to give oilcake to fattening animals, broken or bruised in troughs placed in the yards, and in the fields for sheep: it much hastens fattening, and greatly improves the quality of the dung. Oats are very beneficially used with it, and a portion of salt. Ewes will now drop lambs very fast: attend to shelter and the supply of food. In good weather pull and dress, lay in pits, and remove from all lands, turnips of all kinds for the live stock, that the sowings may be ready. Continue the feeding of fattening and store animals as directed last month.

Plant, during fresh open weather, on suitable grounds, all kinds of forest trees, especially oak, ash, elm, and larch. The second year cut close by the ground the ill-thriven growths of sprouting trees, to secure a more vigorous growth; and, in the third or fourth year, cut off all other shoots, leaving the most vigorous stem for a tree. Plant osiers in beds or rows on low damp grounds that cannot advantageously be made arable from inundations and similar causes. Lay the beds as dry as possible,

and done a year before planting. Cut underwood, and fell timber during the whole of this month; and plant new hedges; plash and repair old ones.

Prepare artificial manures of all kinds possible. Flood meadows; and, if the weather be fine, begin to lay dung on grass lands (rough or strawy), and then bush-harrow and roll, and pick off stones and rubbish. Repair gates and fences; and put grasslands into order by spreading tufts of dung, molehills, and by removing any obstructions.

Dig hop grounds; open the hills, and apply strong manures—rotten farmyard dung, composts of lime and salt; rags and briny oleaginous substances do well. Dress the roots, and cut off the shoots for sets.

Continue under-draining and subsoil ploughing; and the thrashing of grains—sell and deliver.

In early localities, and on dry warm lands, the sowing of crops will begin during this month. Sow early peas on newly-stirred soils, broadcast or by drilling. Sow beans by dibbling, or on ridges, or by drilling on the flat surface. Sow Spring wheat and barley on the last year's turnip lands with one furrow of ploughing; and Spring vetches with a small portion of barley, or oats, or beans, for horses and sheep feed. Sow cabbage seeds on warm well-prepared grounds, for plants to go to the field in May or June.

Collect manure; and prepare peats and similar substances, for burning into ashes.

CALENDAR OF GARDENING.

February is proverbially a wet month, and far better it should be so than keenly frosty. If the ground be a swamp it will be worse than useless to move it, and no time is lost by waiting for a favourable condition. There is one axiom in gardening which ought always to be kept in sight—it is this: Every plot of ground intended to receive a crop should once in the year be either trenched, half-trenched, or digged. The two former operations may be done late in the Autumn, after which the land may be laid up in ridges exposed to the winter frost. But simple digging ought in general to be deferred till the time of cropping, the manure being spread upon the surface prior to operations of the spade: it should always be performed as the work proceeds, sowing or planting piece by piece, that the ground may be finished off neatly.

KITCHEN GARDEN.

Small Salads, i. e. mustard and cress, are now in request, and may be raised very successfully by placing a small single light box over a portion of open rich ground just moved and lying full to the sun. We have seen boxes two or three feet long and about two feet wide with sloping glasses, or, in lieu of them, with frames, over which is stretched a piece of close strong calico, made weather-proof and semi-transparent, by first a coat of flour paste, and then by being twice brushed over with linseed-oil. A few inch-boards, cut so as to slope nine or ten inches at back to five at the front, will suffice; and in such frames close rows of fine cress, and then mustard seed, may be sown: these will yield a profusion of excellent salad in a very few days.

Peas and Beans, to succeed the first crops, are sown about the second week. We are too apt to crowd these vegetables; rows ten or fifteen feet apart yield better, and the spaces may be occupied by other crops; there is more air and less liability to "over-pea" the land by this system. The early Warwick, Cormack's May, and the Charlton pea, are the best: the Mazagan and long-pod bean are also proper for this early season.

Broccoli for November, and sprinkling of *cabbage* for August, may be sown at the end of the month.

Carrots: the early-horn twice—first at the beginning, then in the last week of the month.

Celery, for the earliest crop, must be raised over a gentle hot-bed for the late or Spring crops. A sprinkling of seed can be made on an *asparagus* bed.

Onions: either the Strasburgh or Reading are sown in drills or broadcast: the ground ought to be deep and rich. A very early supply of nice Summer onions may be obtained by digging a plot of ground, raking it smooth, and, as the work proceeds, pressing small last year's bulbs to about one-third of their depth in the soil, nine to twelve inches asunder. These onions ought not to exceed $1\frac{1}{4}$ inches in their width. Each will attempt to put forth a flower stem: and this, as soon as it is clearly visible,

is to be broken or cut off above the bulb. Another, and perhaps a third, effort will be made, which being checked, new bulbs will be developed, the old ones disappearing; and these in July are frequently threefold, and as broad as a hen's egg.

Parsley, Thyme, and other pot-herbs, are sown about the close of the month.

Potatoes: the early Manby, frame, and Lancashire lemon kidney, may be planted in a warm border by the middle of the month, five inches deep, and covered with a layer of old half-decayed leaves.

Radishes and *Lettuces* are sown twice in the month.

Rhubarb: fine seedling plants of the Scarlet Goliath are planted in deep and rich beds five feet apart, but only so deep that the crowns may be three inches below the surface.

Shallots and *Garlic* are planted much in the way directed for summer bulbing onions, four or five inches apart, in a ground of soft sandy loam.

FLOWER GARDEN.

The best annuals are sown in pots or pans, employing gentle heat in glazed frames; thus seed and time are economized, while great protection is afforded from cold and insects. The sorts of plants are generally known—as Venus's-looking-glass, calceolarias, love-lies-bleeding, pinks—crimson and purple, and China asters.

Auriculas grow in protected pots in glass cases, and have air in plenty, but kept from drenching rains.

Polyanthus, in the choice and double varieties, are to be dressed with good maiden loam and a slight mixture of horse dung.

Anemone and *ranunculus* roots may be planted at the end of February in beds richly prepared during Autumn; open a drill or set by dibble; in both cases, let plenty of pit sand lie about the roots.

Do not dig the parterres and borders yet, but rather scatter leafy manures, or old cow-dung and fresh loam over the surface, avoiding the crowns of herbaceous plants.

FRUIT DEPARTMENT.

Currant and *gooseberry* bushes must be finished before the buds open; the former, by close spurring of the laterals and shortening of the upright leaders; the latter, by cutting clean out all very old, and other superfluous, roots. After pruning and taking away the cuttings, hoe and turn the surface an inch or two deep. *Raspberry* bushes are to be cut back to the bend of the rod—six rods are enough to each root. Never dig the ground except to remove ill-situated suckers, but mulch the surface with half-decayed leafy manure.

If peaches and nectarines enlarge the buds, they may be pruned, and then regularly trained.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR
JANUARY.

During the whole of the month the weather throughout the United Kingdom has been remarkably mild, and in some instances rather vegetative. This mildness has led to rather large importations of wheat, barley, and some other articles from near continental ports; and numerous vessels have arrived off the coast from the westward, laden with grain. The consequence has been that, with the exception of a slight rise in the value of wheat in the second week of the month, millers have purchased with extreme caution, and the trade has relapsed into its former dull state. The future course of the wheat trade appears to be involved in considerable doubt and uncertainty. Some parties anticipate a revival in the demand, owing to the limited importations from the United States; but, on the other hand, it should be borne in mind that the stocks of produce in France are extensive, and that any upward movement in the value of food in this country would be immediately followed by considerably increased shipments. True, the supplies of foreign produce in the United Kingdom are not to say very large, perhaps considerably under 2,000,000 qrs., taking wheat, flour, barley, oats, and other articles into this estimate, but they are unquestionably sufficiently heavy to check speculative investments; and whilst our farmers continue to hold very large quantities of wheat the produce of 1857 and 1858, we can hardly anticipate anything approaching excitement in the trade. Again, those important articles, rice and potatoes, are competing to some extent with the better kinds of foods, and it may, we think, be taken for granted that the supplies of rice and potatoes are fully equal to any want that may arise; certainly the growth of the latter has considerably exceeded the calculations made by many parties in September last, and we may go further and say that the general quality of the crop has turned out good. On the continent the produce of the last crop has proved heavy, and the growers are still shipping largely to England. We think, however, that owing to the low prices at which foreign potatoes are now selling, both in London and at the outports, future arrivals will be comparatively small. Our American advices bring somewhat firm markets for both wheat and flour, the prices of which have lately had an upward tendency; but any important rise in value is wholly out of the question, as the quantities of produce in stock in the West is still enormous, and it is calculated that nearly one-third of the crop of 1857 is still on hand. As regards spring corn, we may observe that there has been an improved feeling in the demand for most kinds, especially for the medium qualities of barley and oats. Prices have had an upward tendency, and they are likely to continue firm for some months, arising from the limited quantities on hand in nearly all parts of England. The yield of barley and oats in Scotland last year appears to have been considerably in excess of some former seasons. Not only have the shipments to the South increased, but the sales for home consumption have been large. The weight of those articles, too, has come up to a high figure.

The highly-favourable accounts at hand from the manufacturing districts have imparted considerable firmness to the wool trade. English wool has advanced in price fully

0½d. per lb., and all other kinds have been held for more money. The next public sales of colonial are expected to go off briskly: certain it is that our manufacturers are unusually short of stock, and that the majority of them are working to order.

Although the value of hops has undergone very little change, there has been an improved feeling in the demand for all new qualities. Yearling and old parcels have ruled heavy, though offered on low terms. It is stated by competent parties that the supply of hops now on hand is equal to two years' consumption!

The demand for live stock has been tolerably active, at high quotations. Dead meat has sold extensively, but with a heavy trade, arising from the immense supplies which are almost daily received up to Newgate and Leadenhall from Scotland and various parts of England.

The value of hay and straw in London is about on a par with last year. For instance, meadow hay is quoted at £2 15s. to £4 10s.; clover ditto, £3 10s to £5; and straw, £1 5s. to £1 10s. per load. The demand for hay on continental account has fallen off.

Out-door farm-labours, arising from the extreme mildness of the weather, are very forward. The young wheats are looking remarkably well; but they will soon require additional cold to prevent premature growth.

In Ireland and Scotland wheat has moved off slowly, at about previous quotations. Barley and oats have commanded rather more money, and the value of other kinds of produce has been well supported. The stocks of potatoes are seasonably large.

REVIEW OF THE CATTLE TRADE DURING
THE PAST MONTH.

For the time of year, only moderate supplies of fat stock have been on offer in the Metropolitan Market since we last wrote; but we have observed a decided improvement in the general weight and condition of the beasts and sheep received from what may be termed our leading counties. Notwithstanding that great competition has continued between the live and dead meat markets, arising from the increased supplies of meat received up to Newgate and Leadenhall, both from Scotland and various parts of England, live stock has been in fair request, and prices have ruled high, prime Scots having sold at 5s., and prime old Downs at 5s. 2d. per 8lbs. Compared with the corresponding month in 1858—owing to the continuance of mild weather on the Dutch coast—the imports of foreign stock into London have been on a liberal scale, viz., 1,448 beasts, 7,046 sheep, 750 calves, and 11 pigs, against a total supply amounting to 2,342 head in January last year.

The Norfolk season for beasts has commenced auspiciously. The stock as yet received from that county has turned out remarkably fine—far better, indeed, than in 1858—and we have every reason to believe that we shall continue to draw largely from that source during the next five months. The Norfolk graziers have had the advantage during the last six months of a more plentiful supply of moisture than those residing in Lincolnshire and Leicestershire, conse-

quently the supply of cattle food has been considerably in favour of the Norfolk producers of live stock. We have seen scarcely any home-breds from that county for some time past, and we think that we may safely state that that once numerous and useful breed is now almost wholly extinct. It appears to have given way to the short-horns, of which an unusually large number continues to arrive in London. The extension of the short-horned breed throughout England, as well as in Ireland and Scotland, is, perhaps, the most remarkable event of modern times in stock feeding. So numerous has that breed become, that many of our once-favourite breeds have been considerably reduced in number, and even our best Scots are now extensively crossed with short-horns. No doubt the system is paying well, or it would not be continued at its present extent; but we freely admit that we should regret to see our noble Devons, Herefords, runts, &c., wholly driven out of the field, to make way for animals which may eventually become less valuable by extensive crossing. However, the increase in the short-horns may be taken as evidence of the important secret how the enormous consumption of butchers' meat in this country is now met.

The quality of the foreign beasts and sheep at hand during the past month has shown signs of improvement, arising from most of the inferior stock having been shipped to this country in the last four months of 1856, in consequence of a scarcity of cattle food in the north of Europe. Our impression is that the arrivals of stock from the continent this year will fall considerably short of 1853; hence we may assume that prices here will continue to rule somewhat high. The annexed figures show the importations into the metropolis last month:—

Beasts	1,448 head.
Sheep	7,016 "
Calves	759 "
Pigs	11 "
Total	9,264
Total in 1858	2,342 "
" 1857	4,633 "
" 1856	3,292 "
" 1855	9,102 "
" 1854	7,919 "
" 1853	12,847 "
" 1852	10,567 "

The total supplies of all kinds of stock exhibited in the Great Metropolitan Market are as follows:—

Beasts	19,805 head.
Cows	364 "
Sheep	90,620 "
Calves	921 "
Pigs	2,400 "

COMPARISON OF SUPPLIES.

Jan.	Beasts.	Cows.	Sheep.	Calves.	Pigs.
1858.	20,312	572	80,742	1,108	1,759
1857.	19,949	355	81,200	1,071	2,355
1856.	17,532	435	101,600	757	2,930
1855.	19,717	500	120,470	962	2,625
1854.	19,637	510	95,080	887	2,279
1853.	20,717	480	96,800	2,148	2,360

Beef has sold at from 3s. to 5s.; mutton, 3s. 2d. to 5s. 2d.; veal, 3s. 4d. to 5s. 2d.; and pork, 3s. 2d. to 4s. 2d. per 8lbs., to sink the offal.

COMPARISON OF PRICES.

	Jan., 1855.	Jan., 1856.
	s. d. s. d.	s. d. s. d.
Beef, from	3 2 to 5 0	2 10 to 4 10
Mutton	3 4 — 5 0	2 10 — 5 0
Veal	4 2 — 6 0	4 2 — 6 0
Pork	3 0 — 4 4	3 8 — 5 0

	Jan., 1857.	Jan., 1858.
	s. d. s. d.	s. d. s. d.
Beef, from	3 4 to 5 2	3 2 to 4 6
Mutton	3 3 — 5 6	3 4 — 5 4
Veal	3 8 — 5 0	4 0 — 5 4
Pork	3 3 — 5 2	3 6 — 4 10

Thus it will be seen that pork still continues to sell at comparatively low prices. The depression in value must be attributed solely to the enormous quantities which continue to be forced for sale in the dead markets.

The arrivals of beasts from Norfolk, Suffolk, Essex, and Cambridgeshire, have amounted to 9,750 Scots and short-horns; from the northern and midland counties, 4,000 short-horns, &c.; from other parts of England, 4,900 of various breeds; from Scotland, 1,830 Scots, &c.; and from Ireland, 530 oxen, &c.

In Newgate and Leadenhall large supplies of meat have been on show, and the demand has been far from active. Prices, however, have ruled firm.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

AYLESBURY JANUARY FAIR, (Saturday last).—The fair was well supplied with horses and cattle, but in sheep the supply was very moderate. The trade in horses was active, especially for the best descriptions; the latter realized high prices, inferior sorts being rather lower. For milch Cows there was a good demand, and though the supply was large very few remained on hand, prices averaging from £13 to £20 each. For good barren Cows trade was very brisk; scarcely any remaining unsold out of the very large supply at the fair, but inferior ones did not meet with such ready sale; the best descriptions making £12 to £15, inferior £8 to £11 each. In storks the trade was rather heavy, prices £1 to £3 each. Trade in sheep was sluggish, and though the supply was small a few remained on hand; store wethers making 23s. to 40s, store tegs 17s. to 28s. each.

BANBURY FAIR.—There was a fair supply both of beef and mutton, which found a tolerably brisk sale at from 2s. 9d. to 5s. per 8lbs. for beef, and 4s. to 5s. for mutton, on an average. Messrs. Danby and Calless had their monthly sale

as usual, which included several fine bulls, besides cows, sheep, and a few pigs: the whole sold well.

BANWELL FAIR presented one of the best selling marts that has been held in this part of the country for a considerable time past. The supply of fat stock was far from being in proportion to the demand, and everything fit for the shambles was readily bought up at advancing prices. Good beef fetched from 60s. to 67s. per cwt., and one or two prime lots brought as much as 70s., the principal purchases being made by dealers. Cows with calves by their sides were in request, and averaged from £15 to £17 each. Useful grazing barreners were worth from £12 to £14 each. There was also a marked improvement in the pig trade. It was altogether a good business fair.

BEDALE FORTNIGHT FAIR.—We had a moderate supply of all descriptions of beasts and sheep, with a very sharp market for fat stock, at better prices than have been obtained for some time. Fat beasts 7s. to 7s. 9d. per st., mutton sheep 60d. to 7½d. per lb.

BRIDGNORTH FAIR was not so well supplied as usual, and the attendance was correspondingly thin: the quality of stock was, however, good, and prices fair. Cows for the butcher fetched 7d.; sheep, wether 7½d., and ewes 7d. There was, as usual of late, little or no demand for pigs, which were offered at very low figures. There were a few cows and calves, which went at prices varying from £12 to £16.

GRAMPOUND FAIR.—An average supply of bullocks, and a very dull sale, at from 55s. to 60s. per cwt. But few store cattle offered, and not many inquiries. Of sheep there was not a large supply: the selling price from 6d. to 6½d. per lb. The fair was thinly attended, owing to the unfavourable weather.

HELSTON FAIR.—In consequence of the unfavourable state of the weather little business was transacted. Prices were lower for bullocks of all descriptions.

MELTON FAIR.—On Monday there was a good show of horses. On Tuesday the fair was not so large as on some previous years, but cattle generally made good prices.

NOTTINGHAM FAIR.—The show of horses was considerably below those of former fairs, and there were very few of even average quality. One or two fine horses offered attracted a great deal of attention, but the prices asked tended to prevent a ready sale. Good agricultural horses were in demand, but there were not many offering; and consequently higher prices had to be paid for anything first-rate. A fair number of useful milch cows were shown, but for the best, taking age, appearance, and condition into consideration, high prices were asked, from which the holders would not permit any abatement. A number of sales were effected at prices generally varying from £13 to £18 each. We heard of a few changing hands at as high as £20 to £21 each. Barren cows were somewhat plentiful, and sold readily at from £8 8s. to £12 12s. each, without "turn again." A few first-class heifers were shown, the prices asked for which precluded sales being effected. Ordinary animals brought from £10 to £12 each, several sales being made at as low as from £8 to £9. The day being favourable there was a good attendance, and a full average amount of business was transacted.

SHREWSBURY FORTNIGHTLY MARKET.—The best fat heifer beef sold upon an average at 6½d., second-rate cows 6d. to 6¼d. per lb., and inferior cattle at lower rates, according to quality. Fat calves from 6d. to 6½d. per lb., useful store cattle making fair prices, and cows and calves selling well. Fat wether sheep from 7d. to 7½d., and ewes 6½d. to 7d. per lb. Fat pigs 5d. per lb.; stores much higher, from 5s. to 6s. more money.

TEWKESBURY FAIR was well supplied with beasts, but sheep were rather under the average. Beef and mutton sold at from 5½d. to 7d.

WELSHPOOL FAIR.—So many buyers were present, that the supply was not equal to the demand, and nearly all the stock was cleared off at advanced prices. Beef from 5½d. to 6½d., and mutton 6½d. to 7d. per lb. There were but few horses.

WORCESTER FAIR.—There was a very large attendance of buyers, and a good supply of stock in all classes, fat and store. Many sheep went back unsold. Mutton 7d. per lb. There was a great demand for beef, which made 7d. per lb., equal to an advance of 1d. per lb. within the last month. Pigs, fat brought 8s. to 8s. 4d. per score; stores were dearer.

YORK FORTNIGHTLY MARKET.—We had a very limited supply of all descriptions of stock, which had slow demand. Fat beasts sold at 6s. 6d., 7s., and 7s. 9d. per stone, as per weight and quality; mutton sheep 5½d. to 6½d. and 7½d. per lb.; grazing hogs 25s. to 46s. per head as per quality. Calving and dairy cows had a slow sale at 20s. to 30s. per head below the rates of November and December, and many unsold. All kinds of grazing beasts were in limited supply and demand at rates in favour of sellers. We had a good supply of pigs, which had a fair sale. Scotch and Irish pigs 5s. 6d. to 5s. 10d., English porkers 6s. to 6s. 3d. per stone, including the head and feet. Bacon pigs 6s. per stone, without head and feet. Pork hams realized 7s. 6d. per stone.

IRISH FAIRS.—**GRANARD (COUNTY LONGFORD)**.—The supply of horned cattle was very large, and prices encouraging. Prime beef, of which class alone the supply was hardly an average, sold from 5d. to 6d. per lb., or say from 50s. to 58s. per cwt., at which prices it got a quick sale. Springers in good demand, at from

£10 to £16 each; good three and two-years-old heifers much sought for; yearlings and weanlings rather depressed in value. There was a good supply of prime mutton, which sold at about 5d. to 5½d. per lb.; lambs maintaining their value, without any marked change. There was an immense supply of pigs, which sold considerably under late prices; the first and best class varying from about 40s. to 44s. per cwt.; fine farmers' bacon sold by the fitch or side at 50s. and 51s. per cwt. **BAILIEBOUGH. (COUNTY CAVAN)**: Beef cattle were in good demand, and met with a ready sale, at 55s. per cwt. for prime, inferior qualities ruling at about 40s. per cwt. The buying in the sheep department was pretty active, and nothing remained undisposed of. Prime wethers brought 50s. each, and rated for mutton at 6½d. per lb. Ewe mutton sold at 5½d. per lb. Good hoggets sold at from 35s. to 45s. each. There was a very fair amount of business transacted in this branch. The pig fair was large, and a great many buyers attended. Bacon was something up, prime on the foot bringing from 42s. to 44s. per cwt. Store pigs sold at from £3 downward, according to quality; slips brought from £1 5s. to £1 15s. each, and suckers and weanlings about similar figures per couple. Best milled flax brought 12s. per stone; hand scutched from 8s. 3d. to 9s. 6d. and 10s. 3d. per st., according to quality. **COOTEHILL**.—A considerable business was done in cattle, although complaints of slow transactions were made by holders. Best beef brought 60s. per cwt. The stock of young cattle exhibited was a fair seasonable average, and the demand was brisk for shipment. The prices of sheep were particularly good, not only from the moderate supply, but also from the demand for good mutton for England. Best wether mutton brought 7d. per lb. There was a very extensive supply of swine, and an equally good demand. Bacon advanced considerably, and stores were also in good request. **BALLYBAY**.—Fat cattle of a fair description sold well in all cases, and milch cows and springers also realized pretty fair figures, being in active request. Store cattle maintained late rates, and were bought actively where the quality was good. There was but a moderate supply of sheep, which sold very freely, wether mutton fetching 6½d. to 7½d. per lb. There was an immense supply of pigs, and a large number of buyers for the English markets. In general, pigs advanced in value, bacon on foot being 50s., being about 5s. per cwt. higher than at Christmas. Store pigs fetched 30s. to 50s. each. **DUNDALK**: A very excellent demand was apparent, and the holders of stock seemed to feel a confidence in, at least, steady prices. The amount of cattle on the ground was smaller than usual, but the quality was good, and the demand for them active. Prices in general seemed higher than last year. The sheep market was very thinly supplied, and good mutton was very dear. Bacon pigs sold well at 45s. to 50s. per cwt., stores from 50s. to 60s. each. The horse fair was a failure. **TAGHMON**: There was only a limited show of each description of stock, but an upward tendency was observed on everything offered for sale. Bacon Pigs 38s. to 41s. per cwt. Fat cattle very scarce, and in active request. **CASTLEBRIDGE**: The tone of trade closely resembled that at Taghmon. **MAGUIRE'S BRIDGE** was poorly supplied in every department, except pigs. Beef was in moderately good request; young cattle, calves, and stores sold particularly well; springers also met a smart sale; pigs, both fat and stores, met a ready sale. Good bacon, on foot, 45s. to 50s. per cwt., and horses sold well.

CHIPPENHAM GREAT MONTHLY CHEESE MARKET.—150 tons of cheese were pitched, which, for the time of year, was a good supply, and the whole met a ready sale at the undermentioned prices. In the cattle market there was a good supply of fat cattle and dairy stock, for which there was a good demand. Broad doubles 56s. to 64s., prime Cheddar 58s. to 63s., thin 46s. to 51s., loaves 63s. to 70s., skim 23s. **GLASGOW CHEESE MARKET**.—Supplies were larger than usual. There were twelve tons passed the weigh-house scales, and one cart was shown in the market. New 42s. to 45s., prime early-made 53s., skim 23s. to 25s. per cwt.

GLOUCESTER CHEESE FAIR.—The supply, though fair, was not equal to that at some previous markets, being about sixty tons only, while the quality was but middling. The attendance of buyers was small. For best samples the trade was brisk, but indifferent were little inquired after. The following are the quotations: Best skim 54s. to 58s., seconds 40s. to 48s., skim 24s. to 28s. per cwt.

REVIEW OF THE CORN TRADE DURING THE PAST MONTH.

The first month of the new year has passed over with a temperature more like spring than the depth of winter, with but a slender fall of rain; the roots of the wheat have therefore been making progress in the backward pieces, and generally the prospect is as favourable as could be desired, the ravages of slugs being reduced by their perishing abundantly in the successive droughts. Ploughing has gone on almost uninterruptedly, and there is every probability that spring corn will be planted as favourably as wheat, from the forwardness of tillage. More water is, however, wanted for the cattle, and the springs continue low.

The wheat trade opened well at the commencement of the month, but the prevalence of damp weather, with good foreign arrivals, eventually brought back old prices and a relapse into dulness. The average price of the past year was 4*l*s. 5*d*.; and if the report be truthful that with an average price less than 5*l*s. wheat will not pay for growing, the agricultural interest has had a year of sacrifice to meet, instead of being recompensed, which must have pressed especially hard upon such as have taken new farms; but as for eleven years previously the average was 5*l*s. 10*d*., a tenant of this term has only found one bad year out of twelve, and has every reason to hope for the recovery of his position. Notwithstanding the plenty that has always appeared of foreign samples in London, the arrivals in this port have been less than the usual proportion, viz., 657,737 qrs. only, out of 4,275,430 qrs. received in the United Kingdom. Stocks also turn out much less than generally expected; an eminent house having, after much painstaking, found the quantity to be about only 230,000 qrs. on January 1st; but our former calculation of the quantity of spring corn was pretty correct, there then being about 320,000 qrs. oats, 60,000 qrs. barley, 16,000 qrs. beans, 7,400 qrs. peas, with 11,000 qrs. rye, and 23,000 qrs. Indian corn. If, therefore, London be taken as a criterion of the probable stocks elsewhere, and two-thirds of the imports of wheat have been consumed, it seems about fair to take the entire stock of the United Kingdom at something over 1,250,000 qrs., which is about a month's consumption in hand as a provision against future disasters. The want of granary-room has been partly occasioned by free-trade making less necessary than formerly, from the absence of speculation, and the more frequent sales ex ship, so that many granaries have been converted into sufferance wharves for

general shipping purposes. Notwithstanding the openness of the season, Baltic supplies have greatly fallen off, wheat prices being relatively dearer there than here; but France has kept sending at a losing rate, and the shipments due from the Black Sea and Mediterranean have arrived simultaneously, and added to the heaviness of markets. The present low rates may certainly be traced to the abundant year 1857 in a time of peace, as much of this crop yet appears held; but the excessively large consumption that has been going on for cattle-feed, and other purposes than milling, will, we think, be felt as the season advances; while the perpetual rumours of war and real preparations for it, we think, should deter holders from making unnecessary sacrifices, the probabilities being much more in favour of a rise than decline. The accumulations at New York, which were at one time feared, do not appear to deter holders from demanding rates fully equal to our own; and there has been a speculative trade occasionally, with the best wheat at 5*l*s. 8*d*. per 480*l*bs., the average price of the first quality for six years being 5*l*s. per qr. The stock on 1st January was estimated at only 150,000 qrs.

The following quotations are taken from the market reports of the principal places abroad:—At Paris wheat ranges at from 35*s*. to 40*s*. per qr. Antwerp quoted 45*s*. as the top price; 62 to 64*l*bs. wheat at Louvain was worth 5*l*s. Polish wheat at Amsterdam brought 5*l*s. to 55*s*. per qr. Hambro' quotations were 40*s*. to 45*s*. At Stettin red wheat was at 40*s*. to 44*s*. 6*d*. The best high mixed at Danzig brought 49*s*. per qr.; Berlin prices were only 1*s*. per qr. less. Odessa remained too high for profitable shipment, 34*s*. to 35*s*. being the price of Ghirka and Sandomirka. Middling new at Galatz was 31*s*. per qr. Good quality at Trieste was saleable at 42*s*. Soft wheat at Leghorn was worth 39*s*. per qr. The demand for Spain, with light supplies, had sent up hard wheat at Algiers to 49*s*. Red wheat at Philadelphia was worth 42*s*. per 480*l*bs., white 47*s*. 6*d*. New York was still higher priced, fine white Kentucky being worth 52*s*. per 480*l*bs., which, taking the weight at 62*l*bs. per bush., equals 53*s*. 6*d*. per qr.; while choice Missouri flour was up to 35*s*. per b*l*., or 50*s*. per sack, though round hoop Ohio for shipping brings only 22*s*. 8*d*. per b*l*., or equal to 32*s*. 6*d*. per sack, which is 4*s*. 6*d*. per sack above the price of Norfolks in London.

The first Monday in London had a brisk wheat trade. The supply of the previous week being

moderate, with very little foreign excepting low Egyptian. Very few samples appeared in the course of the morning from Kent and Essex, and the last country reports being lively, millers readily took all fine dry qualities at an advance of 1s. to 2s. per qr. The business in foreign was limited in consequence of the increased demands of holders, but the prices made in retail were good. Most of the country markets responded fully to this advance, including Hull, Manchester, Spalding, Gloucester, and Bristol; but Birmingham, Newark, and Louth, and some other places, were only 1s. per qr. higher, while Market Harborough and Gainsborough advanced 2s. to 3s. per qr. Liverpool in the course of the week was 3d. per 70lbs. higher, 2d. being gained on the Tuesday, and 1d. more on the final market.

The second Monday, with a somewhat better supply of foreign wheat, had rather less of home-growth, though the morning's show from Kent and Essex was increased. The market opened with factors raising their demands; but it was soon found that nothing beyond the previous rates would be given, except for some picked and scarce qualities, and some red suitable for shipment to Portugal, which sold at 42s. to 45s.; a clearance of the bulk eventually took place at the former rates. This continued firmness had the effect in the country of increasing the supplies, which with the damp weather prevailing, was connected with a deteriorated condition, and a reserve on the part of millers. Birmingham noted a decline of 1s. per qr.; but Sheffield was rather improved, notwithstanding the general dulness. The week closed very calm in London, the inquiry for Portugal and contract out, alone preventing a fall. Liverpool on Tuesday, improved to the extent of 1d. to 2d. per 70lbs., but lost tone on Friday, with but a retail trade.

The third Monday had moderate receipts, and former prices were generally maintained for a while; but with a fair show from Kent, and disposition to sell, the rates eventually were fully 1s. per qr. reduced, still with the qualification of a generally inferior condition arising from the mildness and damp. In the country generally the same state of trade obtained, and the average decline was 1s. per qr., though some places only reported a dull state of trade, at previous prices. Liverpool gave way on Tuesday 1d. to 2d. per 70lbs., with only a retail business on the following market, at scarcely former rates.

The fourth Monday had fair supplies of English growth, and a somewhat heavy arrival of French, with little other foreign. The near counties sent up but few additions in the morning; but the condition of nearly all the English on show was wretchedly

bad, and was therefore scarcely a criterion of the state of trade. No change in the rates was, therefore, quoted, as picked parcels of red had made 45s. to 46s., and really fine white was equally high. In the country, reports were generally dull.

The four weeks' imports into London were 23,711 qrs. English and 41,513 qrs. foreign, against 13,618 qrs. English and 66,644 qrs. foreign during the first four weeks in 1858, showing an average of 16,306 weekly, against 20,065 qrs., or decrease per week of 3,759 qrs. The four weeks' sales noted were 396,405 qrs., against 381,981 qrs. in 1858. The four weeks' imports into the principal towns were 169,973 qrs. wheat and flour. The total imports for December were 286,906 qrs. wheat, and 237,526 cwts. flour, for the United Kingdom.

The flour trade, after slight fluctuations in country and foreign descriptions, has closed 1s. per sack less than at the commencement of the month, the town trade having maintained the top price of 40s. per sack all through. Norfolks though held at 27s. 6d. were scarcely worth over 27s. per sack at the last market, and the best French were barely worth 32s. per sack. Scarcely any fine American is on the market, it being dearer at home. The stocks of foreign are very low, and estimated at only 21,000 brls., with 12,000 sacks French on the 1st January. The imports for the four weeks into London have been 77,556 sacks from the country, 5,213 brls. from America, and 7,977 sacks from France, &c., against 71,217 sacks country, 20,696 brls. American, and 9,570 sacks foreign, in January 1858, showing a decrease in brls. of 15,483.

The barley trade, with good supplies of foreign, and moderate arrivals of home-growth, has very little altered as respects value. The scarcity of really fine malting samples on the London market has continued, and prices have consequently been supported, making the value on a par with red wheat of the first quality, but the heavy supplies of inferior sorts from the Black Sea and Mediterranean have kept these latter below the range of Oats of fair quality, as 50 lbs. per bushel has been selling at 22s. 3d. The heaviest markets in these descriptions were the first and last, but the relatively low price has greatly increased the consumption, and the rise in oats has occasioned a large consumption. Sweet heavy Swedish and Danish sorts have been steady throughout. The deficiency of our own crop being more apparent with the season's advance, we think there is a probability of an increase in the rates, though malting sorts can hardly be dearer with the competition of wheat, but these must now be in small compass. The imports into London for the four

weeks were 17,279 qrs. native and 65,146 qrs. foreign, against 14,570 qrs. English and 39,536 qrs. foreign in January last year, or a weekly average of 20,605 qrs. against 13,526 qrs.

The malt trade in the early part of the month was very heavy, but improved subsequently, and finished excessively dull. Scarcely any difference can be noted in the value, but it has been in favour of buyers.

In oats there has been a material improvement, consequent upon the great falling off in foreign supplies, especially from the Baltic. The first Monday, with rather above an average arrival, following a short market, was without alteration as respects value, and a steady trade. The second, which was about equal to it, noted an improvement of 6d. to 1s. per qr. The third Monday being extremely deficient as respects foreign arrivals, which were only 4,230 qrs., a further enhancement of 6d. to 1s. per qr. took place; but the last market had less buoyancy after the repeated advance, it being known there were large quantities in granary, which, however, would still lose money to sell without a further improvement. As neither France, Belgium, nor Holland is likely to send much, from the partial failure in their crops, and as we doubt the ability of Odessa to keep sending on a sufficiency for the British markets, we cannot help expecting higher rates as the season gets on, the consumption being immense. The four weeks' imports into London have been 1,150 qrs. only of English growth, 11,489 qrs. Scotch, 15,790 qrs. Irish, and 80,691 qrs. from abroad, giving the moderate weekly average of 27,279 qrs., while in November last it was 63,748 qrs. The four weeks' exports were 5,610 qrs.

The supply of English beans has been moderate, but of foreign good. This pulse, however, which lately was much neglected, has gained favour, the supplies from Egypt being expected to be reduced. During the second and third Mondays, when foreign supplies were small, there was an improvement in each market of 1s. per qr., making the increased value for the month 2s. per qr. The prices, however, of maize and low barley seem likely to check any material increase in the value of this pulse, more especially as the low qualities of wheat have been found highly nutritive for cattle feed. The four weeks' imports have been in native sorts 3,526 qrs., in foreign 20,073 qrs., giving the fair weekly average of 5,899 qrs., against 3,872 qrs. in January, 1858. There has been an export of 1,373 qrs. in four weeks.

Throughout the month peas have been unusually dull, and without demand. Duns and maples have been in very limited quantity to market, and their scarcity has kept them dear; and English boilers have also been in short supply, but the long preva-

lence of mild weather, and the low prices of rice and potatoes, have diminished the demand for splitting very seriously, so that they remain of less value than maples. It is now getting so late that much rally can scarcely be expected; but as foreign supplies have fallen off, no doubt holders will be unwilling to quit at a reduced rate; and for a retail trade, with small stocks, there may be some advance. The four weeks' imports have been only 252 qrs. from abroad and 1,343 qrs. of home-growth, against 243 qrs. foreign and 1,710 qrs. English in January, 1858.

The linseed trade, with moderate arrivals and a continued export demand, has been without change in the value of seed, cakes being rather in sellers' favour.

A fair business has been doing in cloverseed, at advancing rates, chiefly in red qualities of a fine description; very little English of much colour and strength having yet appeared at market, and foreign markets having improved. Constant sales of fine French red have been making at several shillings over previous prices, and fine English has ruled high. White seed has been steady, as well as trefoil, at fully the previous prices. Tares having been in demand, the hitherto small supplies have gone off well at fully 4s. to 6s. per qr. more money, and some holders, confident of a further large advance from the deficiency of the crops here and in Germany, have withdrawn their samples for the present. Canaryseed has been dull and declining. In mustardseed little has been doing; and the prices of this seed, as well as of rapeseed and other descriptions used in confectionary, have remained much the same.

CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter.	
WHEAT, Essex and Kent, white.....	39	to 48
red	36	45
Norfolk, Linc., and Yorks., red	39	44
BARLEY, malting	—	to 33
Cleveland	35	42
Grinding	24	26
Distilling	24	29
MALT, Essex, Norfolk, and Suffolk	52	to 60
Kingston, Ware, and town made	52	50
Brown	50	52
RYE	—	new
Oats	30	32
OATS, English, feed.....	19	24
Scotch, feed	20	21
Irish, feed, white.....	20	23
Ditto, black	19	22
Beans, Mazagan	36	37
Harrow	38	39
Peas, new, white, boilers	40	40
Maple	42	42
Grey	37	38
FLOUR, per sack of 280 lbs., Town, Households	34s.	fine 35 40
County	28	30
Households.....	31	34
Norfolk and Suffolk, ex-ship	27	—

FOREIGN GRAIN.

	Shillings per Quarter.	
WHEAT, Dantzic, mixed	44	—
high do.	47	extra — 52
Konigsberg	40	45
Rostock	44	45
American, white	42	48
red	41	45
Pomeran., Meckbg., & Uckermk., red	41	44
Silesian, red	41	43
white	42	46
Danish and Holstein	40	48
Russian, hard.....	39	39
French	41	42
St. Petersburg and Riga.....	38	42
Rhine and Belgium	—	46

Table with columns for grain types and quantities. Rows include: BARLEY, grinding; OATS, Dutch, brew, and Poland's; BEANS, Friesland and Holstein; PEAS, feeding; FLOUR, per sack.

IMPERIAL AVERAGES.

Table showing weekly averages for Wheat, Barley, Oats, Rye, Beans, and Peas. Columns include 'Weeks' and 's. d.' for each grain type.

COMPARATIVE AVERAGES—1858-59.

Table comparing current prices with 1858-59 prices for Wheat, Barley, Oats, Rye, Beans, and Peas.

PRICES OF SEEDS.

BRITISH SEEDS.

Table listing prices for various British seed types like Trefoil, Mustardseed, Coriander, Canary, Linseed, and Rape Cake.

FOREIGN SEEDS, &c.

Table listing prices for foreign seeds including Cloverseed, Trefoil, Hempseed, and various types of Linseed.

HOP MARKET.

BOROUGH, MONDAY, Jan. 21.—Our market for the season of the year continues to show a large amount of activity, and from the few good samples offering an increased tendency to improvement in prices is observable.

Table showing hop prices for Mid and East Kents, Weald of Kents, and Sussex.

POTATO MARKETS.

SOUTHWARK WATERSIDE, MONDAY, Jan. 24.—Since our last report the arrivals coastwise and foreign have been light. The trade is firm at much the same as the prices of the previous week.

Table showing potato prices for various regions: York Regents, Flukes, Lincolnshire Regents, Dunbar do., Ditto Reds, Essex and Kent do., Perth, Forfar, & Fifehire Regents, Ditto Reds, Ditto Rocks, and French Whites.

COUNTRY POTATO MARKETS.—York, Jan. 15

Potatoes sell at 6s. per peck, 1s. 8d. to 1s. 10d. per bushel. LEEDS, Jan. 18: We had a moderate supply of potatoes, which sold at 7½d. to 8d. wholesale, and 8½d. retail per 21 lbs. RICHMOND, Jan. 15: Potatoes 2s 8d. per bushel. SHEFFIELD, Jan. 18: Potatoes sell at 6s. to 8s. 6d. per load of 18 stones. MANCHESTER, Jan. 18: Potatoes 6s. to 10s. per 252 lbs.

PRICES OF BUTTER, CHEESE, HAMS, &c.

Table listing prices for various dairy products: BUTTER, per cwt.; CHEESE, per cwt.; HAMS, including York, Westmoreland, and Irish; BACON, including Wiltshire and Irish.

CHICORY.

Table listing prices for various types of Chicory: LONDON, SATURDAY, Jan. 22; ENGLISH, per ton; HALTINGEN; BRUGES; HAMBURG.

WOOL MARKETS.

ENGLISH WOOL MARKET.

LONDON, MONDAY, Jan. 24.—Very little home-grown Wool is now on offer, owing to some of the holders having withdrawn their samples from the market for the present. However, the amount of business doing in all kinds is somewhat restricted, owing to the firmness on the part of the staplers; nevertheless there is every prospect of higher rates.

BRADFORD WOOL MARKET, (Thursday last).—The flatness in the wool trade still continues. Very few sales have been effected during the past week, but prices are well maintained. In wools and shorts there is no change to notice. Yarns: The spinners keep well employed to order, and prices have undergone no change. The demand for Lancashire is less buoyant, but for this district and the Scotch markets it is unabated. In the export trade there is decidedly less doing, a result most probably occasioned by the unsettled aspect of political affairs on the Continent. Pieces: There is a full average of merchants here to-day. The supply of goods in the market is remarkably small. The greater part of the goods now producing being made to order, the transactions of the day are but little indication of the actual business doing.

LIVERPOOL WOOL MARKET, JAN. 22.

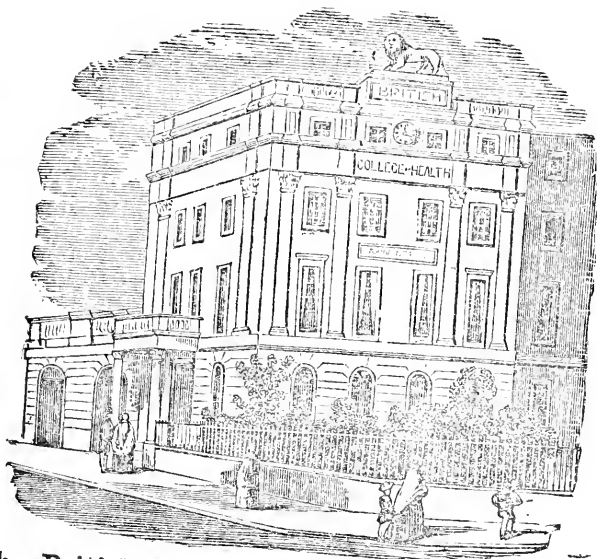
SCOTCH.—There is a fair demand for laid Highland wool; at the quotations; stocks light, and holders very firm. White Highland is in fair demand. Cheviot and crossed are in good demand, at improving prices.

Table showing wool prices: Laid Highland Wool per 24lbs.; White Highland; Laid Crossed; Laid Cheviot; White Cheviot.

FOREIGN.—The public sales commenced here on Tuesday, the 13th inst., when there was offered about 1,500 sheets of English fleece and skin wool. The attendance was numerous. The condition of the skin wool was not first-rate. The competition was good for the middle and better kinds; but the lower kinds were all withdrawn. The East India began on Wednesday, and have been continued up to this day. 8,700 bales have passed the hammer, and have gone off with spirit at an average advance on last sales of 7½ to 10 per cent. The sales will continue to the 27th.

BRESLAU WOOL REPORT, Jan. 17.—Business since the beginning of the new year continued very lively, and had almost nothing to suffer from political affairs. On the contrary, it received a fresh impulse by the favourable result of the last Leipzig cloth fair, and we had continually numerous purchasers in the market. The chief demand continued for Russian combing and clothing wool at 58 to 66 thalers; ditto scoured (from Odessa and Charkov), 88 to 95; Silesian fleeces, fine ones, 95 to 105; ditto slips, 65 to 72. The whole amount of sales has been about 3,000 cwts., the greater part of which consisted of Russian wools, which have been mostly acquired by the clothiers and combers of the Zollverein, as well as by Berlin wholesale buyers. In the meantime there have been made very extensive contracts on the sheep's back for the future clipping at an advance of 10 to 15 per cent. above last year's June fair quotations. The most enterprising speculators in this mode of business were those of Vienna, the Netherlands, and Berlin; but outward home-wool dealers have equally secured themselves many a large and renowned flock.—GUNSBERG, Wool-broker.

BRITISH COLLEGE OF HEALTH,
Euston Road, London.



Where MORISON'S MEDICINES
are compounded.

Report of the British College of Health, Euston Road, London.
FOR 1859.

FELLOW-COUNTRYMEN,

SINCE we addressed you last year, the Medical Profession have obtained from Parliament what they call a "MEDICAL REFORM BILL;" but wherein the "reform" consists, so far as the public is concerned, we are at a loss to make out. If any good for the people at large had been effected by the measure, we should applaud it; but so far as we can see, the Bill only appears to us to be a step in the wrong direction, by creating a kind of Medical Inquisition throughout the country. In their appeal to Parliament, Doctors went on the plea, that many persons, not being legally Doctors of Medicine, fraudulently assumed the title, and by that means took many fees which otherwise would have gone into the pockets of the Simon Pures. Now, we are not the parties who, for one moment, would uphold such a state of things, for we think that MEN SHOULD BE WHAT THEY SEEM; but at the same time, we do not believe that such a practice has been carried to any very great extent. Most people, when they employ a Doctor, know pretty well what they are about, but they well know also that *no two of them agree!* However, be this as it may, the British Parliament were prevailed upon to pass a Bill, which tends to establish a sort of Medical Inquisition in the country. We say "tends," because it is only the small end of the wedge which has at present been driven; but we fear that unless the people are alive on this question, they may hereafter find themselves under as horrible a Medical Priesthood, as Protestants would be if they allowed the terrible Inquisition of Rome to have sway in this country. There must be liberty of thought in Medicine as in Religion; and since the Romish Church does not allow such liberty, we protest against it, as being against the liberties of mankind. It is entirely owing to this great principle of liberty of thought and action, that England now stands so pre-eminent over all the nations of the earth; and will you do any thing, or consent to any thing, that may do away with this greatness? Surely not. Well, then, let Members of Parliament beware how they interfere with the "Medical Liberty of the Subject;" for as sure as that liberty is taken from the people, so sure must the downfall of England commence, because we look upon Medical Liberty as the key to all other liberties. If you have not Medical Liberty you cannot have Religious Liberty; you have a Medical Priesthood, you must have a Religious Priesthood; you have Doctorcraft, you must have a Priestercraft; and if you have a Medical Inquisition, you must have a Religious Inquisition—the one supports the other! The late JAMES MORISON, the Hygeist, clearly foresaw all this, as appears in his Biographical Sketch, wherein he exhorts the people to free themselves from the thralldom of a Medical Priesthood, under which the country is groaning.

You have had this last year some terrible examples as regards the power of the Medical Priesthood with respect to alleged lunatics; but you are much deceived if you fancy that our Parliamentary noodles will do much next Session to alter the present disgraceful state of things as regards lunatic asylums, &c. From experience we know the perfect apathy of Members on every thing pertaining to Medicine. They are perfect children on such a question. It will only be necessary for a Member or two to talk about "medical science" (heaven save the mark), "respectable practitioners," and so forth, and John Bull will be perfectly willing, sane or insane, to be dragged to a mad-house, without even the chance of obtaining the writ of *habeas corpus!*—that bulwark of English liberty. We are getting up a petition to Parliament on this question of lunacy to be presented next Session, but we have little faith of its success. The usual rallying cry of "Quackery" will be quite sufficient to prevent Honorable Members from doing justice to the people, and the consequence will be that Doctorcraft will again appear to the country as having

obtained another victory. So it was with respect to the Poison Bill, which is now a dead letter, merely because it was found that Doctorcraft, being the principal meddlers with poisons, they could not be interfered with. Even Dr. William Palmer, of Rugeley notoriety, did not open the eyes of our Parliamentary noodles on this question. The fact is, we are a doctor-ridden country, and until people will think and judge for themselves, on the laws of health and disease, they must expect to have Doctor Palmers. Look at the dreadful suicide by strychnine, reported in the "Daily Telegraph." There we find an account of a young girl taking "an infallible vermin destroyer," containing that cursed strychnine, which has been introduced into the Pharmacopœia as a medicine. We hold the Medical faculty to be responsible for all such cases. This infernal strychnine, we understand, is scarcely ever used; then why is it not altogether done away with from the Pharmacopœia? How will our Parliamentary noodles now deal with these "infallible vermin destroyers?" A thing more dangerous to the whole country could not be devised. And who have we to thank for the introduction of these deadly poisons? Why, our friend—the Doctor! who has made them ten thousand times more dangerous by holding them out as "medicines in certain cases,"—the difference between the Doctor and the Poisoner being only a question of half-a-grain, or even less. Think of this, and the whole question is at once made palpable. We have attempted, by illustrations, to expose the infamy of the whole concern, and it now remains for the people to assert their right on this all-important question. We may add that the illustrations are sold at the "Hygeist" Office, 292, Strand, London, price 6d. each.

You are aware, from the newspapers, of the terrible failure of re-vaccination in the French army by order of Napoleon the 3rd. The mortality attending the regiments at Toulouse from that loathsome disease was frightful. It is exactly what we expected, but all seems to be *forgotten!*

The schism which now exists between the Allopath and Homœopathic Doctors ought to open the eyes of the public to their contradictory theories, but we presume that, like other things, it will be a nine days' wonder, and that John Bull will just allow himself to be treated for his diseases right or wrong—hit or miss. Should it be so?

As regards the Universal System of JAMES MORISON, the Hygeist, which has now stood the test of 30 years' most extensive practical experience in all parts of the world, (during which period upwards of 500,000 persons have been cured of their diseases,) we have only to say, that the principles of that system are before the world, and by them, Hygeists must stand or fall.

SYNOPSIS OF THE HYGEIAN SYSTEM OF MEDICINE.

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| <p>1.—All animal bodies consist of <i>fluids</i> and <i>solids</i>.</p> <p>2.—While in a state of embryo, all animals consist <i>entirely</i> of fluids.</p> <p>3.—It is from and by the fluids that the solids are <i>formed</i>.</p> <p>4.—The fluids contained in the human body are <i>four times</i> the weight of the solids.</p> <p>5.—The chief of the fluids is the blood, from which all the others are derived.</p> <p>6.—The blood not only <i>repairs</i> every part of the human machine, but also carries with it all the rubbish or <i>decayed parts</i>, to be deposited in the intestines previous to being <i>expelled</i> along with the excrement.</p> <p>7.—The blood is the <i>life</i>—the <i>primum mobile</i>—the <i>first agent</i>—from which all others derive their origin.</p> <p>8.—Health depends upon the <i>purity</i> of the blood.</p> <p>9.—The purity of the blood depends upon its having <i>free outlets</i> for its decayed particles.</p> <p>10.—Disease is induced by the choking up of these outlets in the bowels, by reason of an accumulation of glairy mucus on the inner surface of the intestines, &c.</p> | <p>11.—This accumulation is occasioned by anything that weakens the circulation or impairs digestion, but chiefly by the poisonous drugs and bad treatment of the Faculty.</p> <p>12.—The impurities thus detained in the blood, occasion <i>every</i> species of disease, according to the quality of the humour, or the particular locality in which it is lodged.</p> <p>13.—All diseases proceed from <i>one</i> source, therefore they may all be cured by <i>one</i> medicine.</p> <p>14.—This medicine must be a <i>vegetable purgative</i>, innocuous in itself, yet sufficiently powerful to pervade the whole system, clear away such mucus, and purify the blood.</p> <p>15.—The discovery of a <i>vegetable compound</i>, capable of being digested, and mixing with the blood, so as to impart to it the energy requisite for ridding the body of <i>superfluous</i> humours, was a desideratum.</p> <p>16.—This discovery was made by JAMES MORISON, the Hygeist, in the composition of the <i>Vegetable Universal Medicine</i> of the British College of Health, Euston (late New) Road, London.</p> |
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If these principles are correct, (of which we ourselves, and hundreds of thousands of others have no doubt) then it follows that all the terrible Pharmaceutical poisons which load our Chemist shops, and which are to be had for the asking, might be done away with, thereby saving a great number of valuable lives. Poisonings are increasing throughout the country all owing to Doctors having spread Poisons throughout the length and breadth of the land, and are now become quite common everywhere. You have lately had a terrible catastrophe at Bradford, through arsenic having got into lozenges by mistake—this very arsenic is used by Doctors for the alleged cure of skin diseases. We would take issue with Doctors upon this very point, and contend that with our simple *Hygeian Vegetable Purgatives*, we could cure, whilst they failed to cure, such skin diseases: but the fact is, that all such deadly poisons are kept before the world to throw mystery and confusion in the healing art, and thus form the strong bulwark of a *Medical Priesthood*, from which the nations of the earth have yet to emancipate themselves.

We are, Fellow-Countrymen, your most obedient humble Servants,

THE MEMBERS OF THE BRITISH COLLEGE OF HEALTH,
FOR THE SOCIETY OF HYGEISTS.

IMPORTANT TO FLOCKMASTERS.

THOMAS BIGG,

AGRICULTURAL AND VETERINARY CHEMIST,

BY APPOINTMENT, TO H. R. H. THE PRINCE CONSORT, K. G., &c.

LEICESTER HOUSE, GREAT DOVER-STREET BOROUGH, LONDON,

Begs to call the attention of Farmers and Graziers to his valuable SHEEP- and LAMB-DIPPING COMPOSITION, which requires no Boiling, and may be used with Warm or Cold Water, for effectually destroying the Tick Lice, and all other insects injurious to the Flock, preventing the alarming attacks of Fly and Stab, and cleansing and purifying the Skin, thereby greatly improving the Wool, both in quantity and quality, and highly contributing to the general health of the animal.

Prepared only by Thomas Bigg, Chemist, &c., at his Manufactory as above, and sold as follows, although any other quantity may be had, if required:—

4 lb. for 20 sheep, price, jar included	£0	2	0
6 lb. 30 " " " " " " " " " " " " " " " "	0	3	0
8 lb. 40 " " " " " " " " " " " " " " " "	0	4	0
10 lb. 50 " " " " " " " " " " " " " " " "	0	5	0
20 lb. 100 " " " " " " " " " " " " " " " "	0	10	0
30 lb. 150 " " " " " " " " " " " " " " " "	0	15	0
40 lb. 200 " " " " " " " " " " " " " " " "	1	0	0
50 lb. 250 " " " " " " " " " " " " " " " "	1	3	6
60 lb. 300 " " " " " " " " " " " " " " " "	1	7	6
80 lb. 400 " " " " " " " " " " " " " " " "	1	17	6
100 lb. 500 " " " " " " " " " " " " " " " "	2	5	0

Should any Flockmaster prefer boiling the Composition, it will be equally effective.

He would also especially call attention to his SPECIFIC, or LOTION, for the SCAB, or SHAB, which will be found a certain remedy for eradicating that loathsome and ruinous disorder in Sheep, and which may be safely used in all climates, and at all seasons of the year, and to all descriptions of sheep, even ewes in lamb. Price 5s. per gallon—sufficient on an average for thirty Sheep (according to the virulence of the disease); also in wine quart bottles, 1s. 3d. each.

IMPORTANT TESTIMONIAL.

"Scoulton, near Hingham, Norfolk, April 16th, 1855.

"Dear Sir,—In answer to yours of the 4th inst, which would have been replied to before this had I been at home, I have much pleasure in bearing testimony to the efficacy of your in-

valuable 'Specific for the cure of Scab in Sheep.' The 600 Sheep were all dressed in August last with 84 gallons of the 'Non-Poisonous Specific,' that was so highly recommended at the Lincoln Show, and by their own dresser, the best attention being paid to the flock by my shepherd after dressing according to instructions left; but notwithstanding the Scab continues getting worse. In December I informed the 'Agent for the above Specific,' that the flock was not cured, and that it requires their immediate attention. The Agent informed me they should be at once seen to, but did not do so until five weeks afterwards, and in the mean time the Scab spread over the whole flock, that I never saw such a disgraceful sight in my life; and when the Dresser was sent over to inspect the Flock, he decided on not dressing them again, as one-third of the Sheep had lost half their wool. I then agreed with an experienced dresser in Norfolk to dress the flock, and when he saw the sheep he declined doing them, as they were so very bad, and the time of lambing so near. Being determined to have the Scab cured if possible, I wrote to you for a supply of your Specific, which I received the following day; and although the weather was most severe in February during the dressing, your Specific proved itself an invaluable remedy, for in three weeks the Sheep were quite cured; and I am happy to say the young lambs are doing remarkably well at present. In conclusion, I believe it to be the safest and best remedy now in use.

"I remain, dear Sir, your obedient servant,

"To Mr. Thomas Bigg." "For JOHN TINGEY, Esq.,

"R. RENNY.

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Ditto ditto with Iron-bar Drainer 5 0 0
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No. 3, Vol. XV.]

MARCH, 1859.

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DR. HASSALL

ON

THORLEY'S FOOD FOR CATTLE.

FROM THE "MARK LANE EXPRESS," 10th JAN., 1859.

74, WIMPOLE STREET, CAVENDISH SQUARE, 21st December, 1858.

HAVING, on more than one occasion, been requested to make an analysis of THORLEY'S WELL-KNOWN FOOD FOR CATTLE, and to express my opinion respecting it, I placed myself a short time since in communication with Mr. Thorley, desiring to be furnished with certain particulars relating to his Food. Mr. Thorley, who was previously a stranger to me, at once conducted me over his Manufactory, showed me all the ingredients employed, and also the process of manufacture of the article.

I took away with me samples of the food as well as of every ingredient entering into its composition. I have since carefully examined and tested these, and I have also compared the samples procured at the Manufactory with others obtained by myself from other sources.

I am, therefore, now in a position to express an authoritative opinion respecting the composition and properties of THORLEY'S FOOD FOR CATTLE. I would remark of it—

First. That the ingredients used are all of excellent quality, and are purchased without regard to expense.

Second. That the receipt or formula, according to which the Food is prepared, is an admirable one, no ingredient being selected on account of its cheapness, but those only being chosen which are best adapted to fulfil the objects intended.

Having regard, thus, to the composition of THORLEY'S FOOD FOR CATTLE, I find that it possesses the following properties in an eminent degree—it is highly nutritious and fattening—it is a tonic and gentle stimulant, aiding, when mixed with other descriptions of food, materially the digestive powers of an animal—a point of great consequence, since it is an undoubted fact that much of the nourishment contained in the ordinary food given to cattle is lost in consequence of the impaired or defective action of the digestive organs.

Comparing THORLEY'S FOOD FOR CATTLE with other Cattle Foods, with the composition of which I am acquainted, I unhesitatingly assert that it is infinitely superior to any others, at present known to me. In all those of the composition of which I have a knowledge, I have found ingredients to be present which have been added solely on account of their cheapness, that is for the purpose of adulteration, and to the exclusion of other more valuable, but more expensive, articles. In some of the Foods I have detected ingredients which are positively hurtful.

Comparing, also, the samples taken by me from the Manufactory with others procured from different sources, I found a perfect accordance in the composition of both series of samples.

Before bringing this Report to a conclusion, I would notice an objection sometimes urged against the use of Cattle Foods generally, namely, that the price at which they are sold exceeds considerably that of the materials from which they are prepared; this can be readily shown to be a very unreasonable objection. THORLEY'S FOOD FOR CATTLE is a compounded and manufactured article, upon the composition and preparation of which much care, labour, and expense have been and are bestowed. Moreover, the refuse materials resulting from the cleansing, grinding, &c., and which are an entire loss, amount to twenty per cent. To estimate, therefore, the value of such an article merely at the cost of the raw materials is both absurd and unjust.

Neither must the value of this, or any other Cattle Food, be determined by the exact amount of nourishment contained in them; although in the case of THORLEY'S FOOD this is very considerable, but the indirect effects resulting from its employment must be taken into consideration; that is, the effects of the article in improving the appetite, digestive powers, and general vigour of the Cattle fed upon it. By the improved condition of the digestive organs animals may be fed upon coarser and cheaper articles of food, and from which, without the aid of THORLEY'S FOOD, they would be unable to extract all the nourishment which such articles actually contain. I consider, then, that the use of THORLEY'S FOOD is attended, not with an additional, but with a considerable saving of expense.

I am glad, therefore, to be enabled to recommend—which I do strongly and conscientiously—THORLEY'S FOOD FOR CATTLE as a highly important and valuable compound for the feeding of all descriptions of Cattle.

Signed,

ARTHUR HILL HASSALL, M.D.,

Analyst of the Lancet Sanitary Commission; Author of the Reports of that Commission; of "Food and its Adulteration;" "Adulterations Detected;" &c., &c.

From Alfred Brown, Esq., Wandsworth, Surrey, Member of the Royal College of Surgeons, England; Licentiate of the Apothecaries' Company, London; Fellow of the Medical Society of London; late Demonstrator of Anatomy at the St. George's School of Medicine.

Wandsworth, Surrey, Dec. 11, 1858.

Sir,—I shall feel obliged by your sending me another cask of Thorley's Cattle Food. I have been making experiments with it upon one of my milch cows, and think it only fair that I should let you know the results. My cow, before I used the Food, was fed upon hay, wortzel, and water *ad libitum*, and upon this diet she yielded one gallon of milk per day, making two pounds of butter per week. She was five months gone with her second calf; when she had the Food I discontinued giving her the wortzel, and gave her a measure-full (about half-a-pint) of the Food with a peck of damp chaff night and morning; besides, she had as much good hay as she would eat. Upon this diet, in less than a week she doubled the quantity of milk and butter; and in order that I might be sure that this excellent result depended upon the Thorley's Food, I discontinued it, and returned to her former diet, and she speedily went back to the gallon of milk per day. After waiting about a fortnight, I again returned to the Thorley's Food, and in a few days she increased to two gallons of milk per day. This experiment I repeated several times, and with the same results. I have tried the Food upon other animals—horses, sheep, &c.—and with the most satisfactory results. I have also analysed the Food, and find that it contains nothing that would in any way injure the system or constitution of cattle. You are at liberty to make any use you please of this communication, and I am, Sir, yours, &c.,

To Mr. J. Thorley.

ALFRED BROWN.

THE FARMER'S MAGAZINE.

MARCH, 1859.

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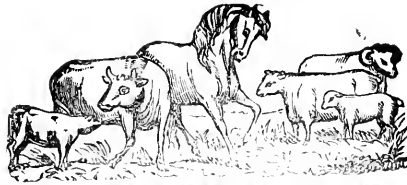
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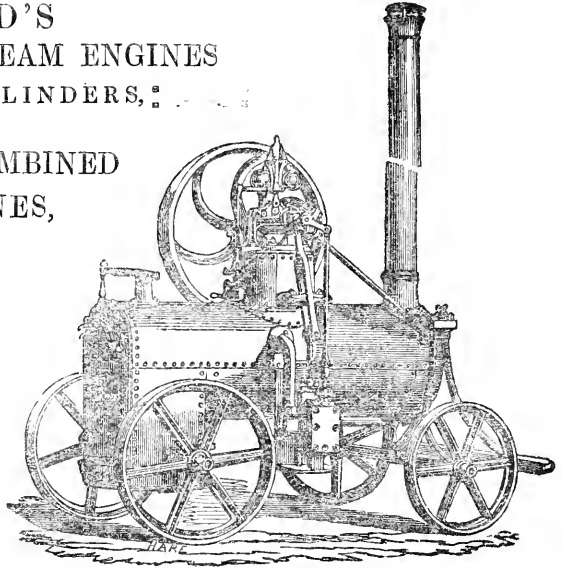
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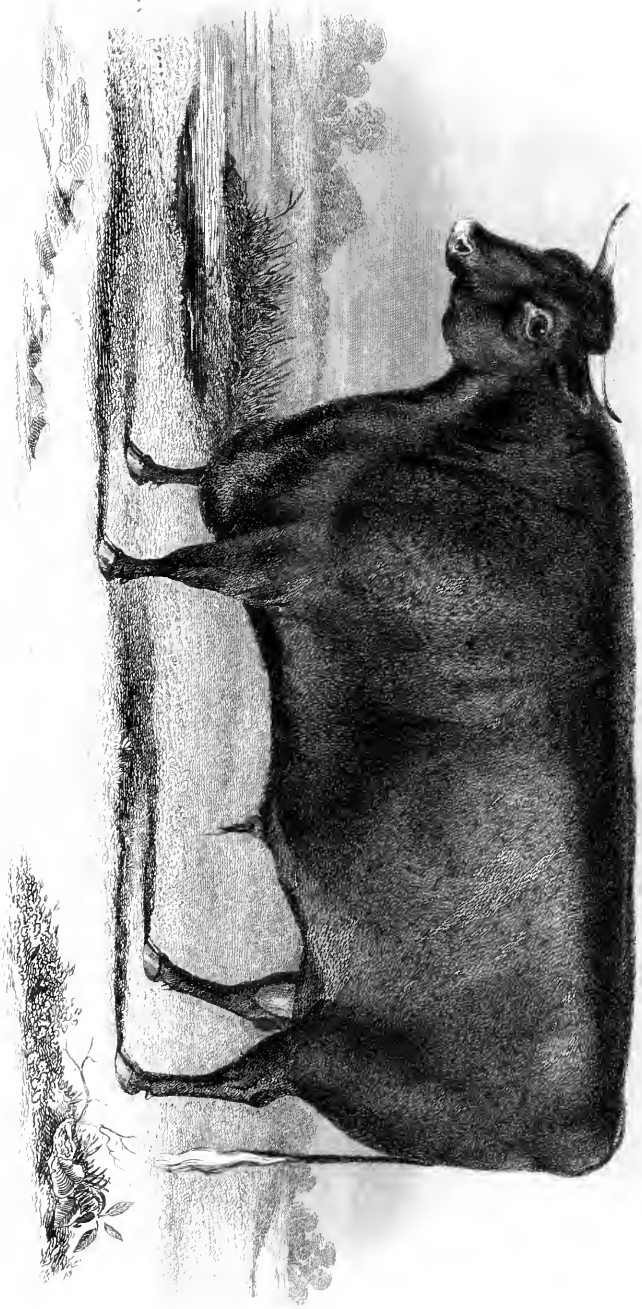
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THE FARMER'S MAGAZINE.

MARCH, 1859.

PLATE I.

“NAPOLCON”: A DEVON BULL,

THE PROPERTY OF MR. JAMES DAVY, OF FLITTON, BARTON, SOUTH MOLTON.

Napoleon, bred by Mr. Davy, is by Quartly's Earl of Exeter, the first prize bull at the Windsor Show, out of Curly (97), a favourite cow of Mr. Davy's, and still in his herd.

Napoleon has only been twice exhibited in public—in June, 1857, at the Newton Meeting of the Bath and West of England Society, where he took the second prize for bulls over three years old, and in the July following, at the Salisbury Meeting of the Royal Agricultural of England, where he took the first prize of £30, as the best aged bull. The Newton show of Devon bulls was the best ever seen in the West of England, and the judges commended the whole of the class in which Napoleon was shown. Again, at Salisbury it is long since there were such a lot to pick from. Napoleon himself is of a very beautiful character and quality, and considered particularly handsome.

Mr. Davy, of Flitton, is the most extensive breeder of the famous North Devons, and he has now a herd numbering over ninety in head. He sends many of his cattle to America, Australia, and other distant parts, as well as commanding the best of the home market. He has just sold two bulls of very high quality to Lord Leicester, for use at Holkham.

Mr. Robert Smith, in his report on the Chester Show, thus writes of the Davys and the Devons: “Captain J. T. Davy's grandfather was an early and zealous breeder of North Devons as far back as 100 or 120 years ago. At his decease Mr. Wm. Davy had a portion of the herd, and bred some first-class animals, which were subsequently bequeathed to his son Mr. James Davy, of Flitton, who has turned them to good account. Captain J. T. Davy has still retained some of the old family sort. It is to this indefatigable gentleman that Devon breeders are indebted for the ‘Devon Herd-book.’ He published his first volume in 1851, the second in December, 1854, and the third in 1858. It is admitted that these volumes contain a faithful report of the pedigrees of the greater number, if not all, of the best Devons. The fact that these Herd-books have been republished in the United States is strong corroborative evidence of their value. In this ‘Devon Herd-book’ mention is made of 29 prize bulls; 27 of them are descended from the bull Forester. Again, there are 34 prize cows; 29 of these are descended from the old cow Curly: both bull and cow are of the Quartly tribe of Devons.”

PLATE II.

“CONFIDENCE”: A NORFOLK COB,

THE PROPERTY OF MR. HENRY OVERMAN, OF WEASENHAM.

“Norfolk,” said Lord Albemarle, at the last meeting of the county agricultural society—“Norfolk produced good turnips, good partridges, good turkeys—good everything in fact; and he remembered that in his younger days it produced also a good breed of trotting horses. Who did not recollect the famous trotting Fireaway? He was afraid that the breed was now very nearly extinct; though he should, personally, be very happy if it were not.” Mr. Spooner, one of the judges, during the course of the evening,

followed on the same side: "There was one particular class of horses to which a noble lord at the head of the table had called attention: the class of trotting horses, of which, as a south-countryman—never having acted as judge at any of the Norfolk shows before—he had certainly expected to find some. If there were any of that celebrated trotting breed existing in some of the distant nooks of the county, let them not lie dormant. He used the word 'dormant' advisedly, because if such an animal, having powers of propagation, were not shown at the society's meetings, he was asleep, or, at any rate, his master was. He trusted that the breed had not entirely disappeared. Such horses, which had been heard of elsewhere, had been greatly prized; and if those present would listen to a word of advice, he would say to them, 'Cherish what remains of this breed as you would that you prize and value most highly;' because, if the good fore-quarters, fore-legs, and action of the Norfolk trotter were once lost, they could never be restored. What remained of the breed should be propagated to the utmost extent."

This is good sound advice, especially in times when a clever hack is difficult to find. But we are at any rate enabled to preserve a sample or two of the sort. Confidence is by Baldwin's well known Robin Hood, a Norfolk hackney of the purest blood, out of a cob mare ridden for many years by Mr. Overman. Confidence himself stands fourteen hands high, is quite up to sixteen stone, and, in addition to sundry other recommendations, has that greatest of all for a hack, remarkably good action. His owner, Mr. Henry Overman, one of the Holkham tenants, has been yet more famous for another description of stock—his flock of Southdown sheep, which, however, was dispersed in the Autumn of last year.

THE HERDS OF GREAT BRITAIN.

CHAPTER I.

A GLANCE AT THE PAST.

The period of Shorthorn memory may be said to date back to about 1770; and it was to it, that Mr. Bates, of Kirklevington, was wont to refer, when, ignoring "Sir James Pennyman's bull," &c., altogether, he maintained that "the first bull was the best, and that was Jame Brown's, of Aldborough." Whatever may have been their comparative merits, he has long since faded into space, and left to Hubback the undisputed title of the Abraham of Shorthorns. The latter, who was calved at Hurworth, near Darlington, in 1777, was one of the yellow red-and-whites, which prevailed everywhere until roan became orthodox. His first stock were nearly two years old, when the quick eyes of Messrs. Robert Colling and Waistell espied him grazing in the midst of them. "Their quiet gig ride that day inaugurated a great era for Shorthorns." Says Colling to Waistell on that memorable afternoon. "*Them's very bonny beasts.*" "*They are*" was the rejoinder; "*and that bull of Robinson's, yonder, must be the sire of them; let's you and I buy him?*" Mr. Robinson was nothing loth, and Hubback was sold for £8, with as much unconcern as one of our best blood sires was passed over to a winner seventy years afterwards, for a stake of that amount at whist. Two or three more harvest moons waned, and Hubback passed out of Waistell's hands at the same price, to Charles Colling, and the bargain was arranged over the tea-table at Robert's house. The latter, no doubt, retained an interest in him, and shared in the five-guinea fees which were forthwith charged to cow owners for his favours. This account differs from that given by Mr. Youatt, but we have received it from one who also heard it from the same lips. The low price in the second instance arose

from Mr. Waistell's very natural idea that his cows were to be bulled gratis.

This purchase set the Brothers Colling fairly afloat; and the new century dawned upon them as the most successful breeders in Durham. Charles, who had pitched his tent at Ketton, had the better herd; but Robert, as the fine print after Weaver fully indicates, was the more original thinker of the two, and his pastures at Barmpton were dotted with Leicesters even still more choice than his Shorthorns. He was wont to say, when speaking of his herd, that he and Charles had nothing better than their neighbours, except the Phoenix tribe, which they originally bought from the Maynards, and from which Comet, the veritable founder of shorthorns sprang. Mr. Mason, of Chilton, followed hard on the same track. He had bought Lady Maynard, the great grandam of Comet, from Charles Colling, and before the sale of the Ketton herd, in 1810, she had gone far towards making his own. Much as he loved his Gaudy, by Favourite, he gradually got rid of such "fool's fat" on the tail and rump; and, as his Portia in 1829 proved, he wrought a great improvement on the open shoulders, a defect which seems to have caught Robert Colling's attention much more than Charles's. The latter also reduced both the size and symmetry of his stock, by a cross with a dun Kyloe, which Coates bought for Col. O'Callaghan, from a man at Northallerton. She was bulled by Lord Bolingbroke, and her daughter and granddaughter were crossed in succession with a pure Shorthorn bull; and it was to prove that the alloy came in with the grandson, that Mason published his bulky pamphlet, after the Ketton sale. Lady and her two daughters, Countess and Laura, and some nine or ten of their tribe, were included under his ban; but his somewhat gratuitous

search for truth was much less intense than his desire to send cows to Comet.

This bull was put in at 400 gs., and the biddings went on gallily by 50 gs. at a time. It had been whispered that 1,500 gs. would not stop Mr. Boazman, of Aycliffe; but it was not to be. Early Shorthorn history—which is, after all, little more than oral tradition—is unusually dim on this head. Some say that he was drawn aside and detained by a confederate of the four purchasers, in an animated conversation in the refreshment tent; while others aver that (like Mr. Richard Sutton, when he came to buy the Yarborough Hercules at the Quoru sale) his post-chaise broke down, and he reached the scene of action only in time to make a fruitless offer to the happy quartet—Messrs. Wetherell, Trotter, Wright, and Charge—of £500 for their bargain. It was agreed between the four that they should only send twelve cows each, and those their *bonâ fide* property; and hence it was only through a fictitious sale that Mason was enabled to gain the long-coveted prize. The alloy curse, which he had so perseveringly thrown in Charles Colling's teeth, was said to have come at last into his own stock in another shape, and from a quarter which he least expected. As one Willy Brack conducted the cow Carnation on a visit to Comet, at Denton, an avenger, according to the legend, appeared for Charles, in the shape of a half-bred bull, which jumped the hedge at her salute; and from this stolen interview came Jupiter and his black-nosed blood. Comet was buried in the fulness of time at Cleasby, and a sycamore in a garth, which is called "Comet's Garth" to this day, and lately passed into the possession of Mr. John Booth, of Killerby, duly marks the spot for all lovers of the Herd Book.

Lord Althorp bought freely at Robert Colling's sale in 1818, when he parted with everything but his heifer calves. This sale bore no comparison in point of blood or prices to the Ketton one; and Mr. Whittaker congratulated himself ever after that he had missed Lancaster (621 gs.), when he fully thought that he had been the last to catch Mr. Robinson's eye, and got Frederick (1,060) instead, for 50 gs. from Mr. Charge. Lord Althorp also said that Nonpareil (370 gs.) did him no great good, and that he was "never really successful till he got the Chiltons." However, when Robert Colling's heifers were dispersed, after his death in 1821, not a few of them passed into his lordship's hands; and when perhaps the finest lot of cows ever offered came to the hammer at Chilton, in 1829, he bought eighteen, the one from which he bred most being "No. 25, 36 gs.," who became Wiseton's dam. Eventually the herd dwindled, as the land at Wiseton was not of sufficient stamina to counteract such close in-and-in breeding. It was at the third Wiseton Sale that Lord Ducie came out with 400 gs. for the two-year-old Usurer, whom he fancied for his beautiful fore-quarters. "Usurer can give shoulders to anything," was his lordship's constant eulogium of him, and he used him extensively. He was in Lincolnshire at the time of the sale, and is, we believe, still alive, at Mr. Nesham's, near Darlington.

Lord Ducie was always bad to beat by hard cash. In fact, he was never worsted but once, and that was by Mr. Thomas Edge for a white heifer at Mr. Rose's sale at Cotham, near Newark. Strange to say, Mr. Edge had never bid more than 100 gs. at a sale before. His friends rallied him in vain on his unwonted ardour. "*She'll look very well in Strelley Park,*" was his only reply; and he seemed to consider it quite a privilege to get her for 220 gs., and sell her for £35, with the reputation of being a free-martin. His lordship always seemed to enjoy the joke; but "*What, beat Tom Edge!*" was his only remark on it.

At Mr. Bates's sale Lord Ducie was as undaunted as ever, and it was nothing but being, in racing phrase, "a good beginner" which secured him the 4th Duke of York so cheap. He had "determined to buy him, or make him dear for some one;" and he put him in so promptly at 200 gs., that although one gentleman at least wished to have him at two hundred more, a sort of stagnation supervened, amid which Mr. Strafford's sand ran down. If the first bid had only been a hundred, three at least would have gone on. It was this sale which first opened that Duchess tribe to the world, which had gone on increasing, and then dwindling at Kirklevington, during the forty years since "T. Bates, Esq.," had been written opposite "38. *Young Duchess*, 2 yrs. old, *by Comet, dam by Favourite*, 183 gs.," in Mr. Kingston's catalogue, on the Ketton day. She was bulled by Comet at the time, and Mr. Bates had never once deserted the blood except for one cross with Stephenson's Belvidere, who was the sire and grandsire of the Duke of Northumberland. It was with him and the Oxford Cow, and his two Duchess heifers, that he set forth and won every prize he showed for at the first Meeting of the Royal Agricultural Society in 1839. They came in a steam boat to London, and walked to Oxford, and it was said at the time that nothing but the presence of Mr. Bates, and the soothing effect of his pat and his "*Poor Duke!*" prevented the latter from slipping off the stage into the water when he turned awkward and declined to re-embark. With the victory of his Cambridge cow, and eight months' bull-calf at Cambridge next year, and his bull Cleveland Lad at Liverpool, the royal prize winning era of Mr. Bates virtually ceased (in fact he hardly ever showed again), and that of the Booths began. Since then, these two have figured as the White and Red Rose of pastoral history, and have had nearly as many adherents in their far more glorious battle field. The Duchess tribe, over which Mr. Bates had watched with such jealousy, were still more dispersed at the celebrated Tortworth sale in August, 1853 (which only fell some two shillings in its average below Charles Colling's), and the Americans had determined to carry the tribe off bodily across the Atlantic, if Captain Gunter and Mr. Tanqueray had not hid against them, Company as they were, and upset all the wise counsels which had been taken at Gloucester over-night.

About £151 was the average at Mr. Charles Colling's sale; £128 at Mr. Robert Colling's; £59 at Mr. Christopher Mason's; £68 at Lord Spencer's;

£67 at Mr. Bates's; £151 at Lord Ducie's; £78 at Mr. Tanqueray's; £80 at Sir Charles Knightley's; £73 at Mr. Grenfell's; £65 at Mr. Bolden's; and £90 at Mr. Majoribanks's. And so the Short-horn tide has ebbed and flowed for nearly eighty years. From 1780 to 1818 it rose steadily. Then came the depression consequent upon the Currency measures; inattention to breeding succeeded, and at least a better feeling set in with Mr. Richard Booth's sale in 1834. The demand was up and down till the Wiseton sale of 1848. At the Kirklevington sale it was about the same, and then America (who had always been great Bates men) and Australia began to show themselves in earnest by their purchases at Tortworth, Fawsley, Hendon, and Bushey, and their private thousand-guinea bargains for the two Grand Dukes, and reached their culminating point in 1,200 gs. for Master Butterfly.

Amid this tangled history, the Booth herd has always played its part, long before it came out at the Liverpool Royal with its Bracelet and Mantalini. Mr. Thomas Booth laid the foundation of the Killerby and Warlabry herds in about 1790. George Coates had not yet arisen to prosecute his peaceful masonic pilgrimage from farm to farm, with his notes and his saddle-bags, on his old white pony; and hence, though the cows from which Mr. Booth bred were of the best class, they had at first no pedigrees. He then selected the best of Robert Collings's bulls, and hired Twin-brother to Ben (660) by Punch, d. by Foljambe, g. d. by Hubback, all of the Barmpton breed. After these came Son of Twin-brother to Ben (whom he bred himself), Suwarrow, Easy, The Lane Bull, and Albion (14) by Comet out of Beauty, whom he purchased for 60 gs. at the Ketton sale. At the Barmpton sale he gave 270 gs. for Pilot (496), of the Wellington tribe, who proved the best bull he ever had. Henceforward he only bred those bulls in the herd; and his sons, with the exception of a sparing use of Lord Stanley, Exquisite, Lord Zetland's Lord Lieutenant (sire of Leonard), Water King, and Mussulman have pursued the same plan. Hamlet, out of Bracelet, was also one of the best his son John ever had; and one season at Killerby he served ten cows at 20 gs. each; but, like Lord-Lieutenant, he was a little coarse in the horn, as many Leonards were.

In 1834, Mr. Richard Booth sold the herd he had gradually got together, since 1817, at Studley, which contained many of the Anna and Young Anna tribe, who were in direct descent from Twin-brother to Ben, and retained only his cow Isabella, whose first calf after coming to Warlabry was a roan bull by Young Matchem (4422). While he was at Studley, Mr. Booth, senior, lived at Warlabry, and had in a great measure a joint herd with his son John, at Killerby. Richard's year out of his business was, as he still terms it, "the longest I ever spent in my life;" and when his father died, shortly after the expiration of it, he removed to Warlabry, and took to his father's herd. The grass at Warlabry is better than that at Killerby, as it is on a stronger soil, while the latter is more adapted for sheep; but the herds, from the perpetual interchange of bulls such as Leonard, Buckingham, Hopewell, Vanguard,

and Crown Prince, have long been virtually one. The brothers cared not so much for that elegance which Bates adored, but went more for that compactness of frame and depth of flesh, which, along with a wonderful fore-flank, is still the great Booth blood characteristic.

After using Leonard, who transmitted his rare substance and constitution to Hope, Gem, and Hawthorn Blossom (who has brought more gold than any other to Warlabry), Mr. Richard Booth bought Buckingham from Killerby, and from him and Isabella came Isabella Buckingham and Vanguard. Buckingham was by Colonel Cradock's Mussulman out of Bracelet, and strained back to Sir Charles out of Toy by Argus. From a cross between him and Blossom III., came Baron Warlabry and Cherry Blossom, and that with her daughter Hawthorn Blossom resulted in Plum Blossom (the dam of Windsor), Bloom, and Benedict. Crown Prince, a son of Fitzleonard and Charity, was put in his turn to Hawthorn Blossom, and from their union came Nectarine Blossom, who knew no victrix last year at Chester, Northallerton, or Sunderland.

The Royal and Yorkshire prize list of the Killerby and Warlabry herds is a bed-roll unparalleled for brilliancy. Taking the Royal alone, it shows 29 *first* premiums to their credit in its 20 years, while the seconds and H. C.'s are legion. The illustrious twins Bracelet and Necklace those female Castor and Pollux of Show Yards, with Mantalini and Birthday, carried all before them, in 1841-44; but the latter's daughter Gem, whom Lord Spencer considered to be the best that Killerby ever turned out, died very early. In 1844, Mr. Richard Booth won his first prize with his yearling heifer Bud, and gathering strength as he went on, swept the three first prizes for cows, two-year-old and one-year-old heifers at Northampton. After this year Mr. J. Booth almost ceased to show, though he won the head two-year-old bull prize with Red Knight at Lewes, and then began a long unbroken series of triumphs for Warlabry, descending through Plum Blossom, Windsor, Bridesmaid, and Queen of the May, to Nectarine Blossom and Queen of the Isles.

Venus Victrix, the second cow at Lincoln, is the last to which the late Mr. J. Booth's name is affixed as a Royal winner; and after 1857, the frequenters of the English and Irish shows, where he had been judge so long, recognised his manly figure and hearty Northern manner no more. The blood from which she sprang left Killerby in Buckingham, and came back in Bloom, whom Mr. Richard Booth presented to his brother. Venus Victrix was bought in at the sale in 1853, by Mr. Richard Booth, and seems likely to fulfil the wishes of the donor in founding another Killerby herd in his nephews' hands. Unlike Altisidora of Bishop Burton stud fame, she did not die in her ditch, but her hip is sadly down from the fall. However, despite her misfortune, she is doing good service to her young masters; King Arthur and King Alfred, both out of her, are let for 400 guineas; her heifer Venus de Medicis, by Vanguard, who was sold to Mr. Douglas for 300 gs. as a

calf in 1856, won the Dublin Challenge Cup for her new owner; and Viatrix by Royal Buck, and a heifer calf for which they lately refused 300 guineas from Lady Pigot, are also out of her. So much for past glories. It remains now for us, in the steady prosecution of our task of visiting the leading herds of England, and reporting them without any regard to ideal precedence, but just as they fall in our way, to make our first halt at Warlabby, and record what we saw there.

CHAPTER II.

THE WARLABBY HERD.

The country between Killerby and Warlabby, which lie about seven miles apart, is not much calculated to interest a stranger to the North Riding; and least of all when he traverses it under the half-raw, half-wet atmosphere of a January sky. The route lies through Ainderby, famed in the annals of the "Stud Book" as the place where the mighty Velocipede "commanded all Yorkshire" for two seasons, after his faulty sinew had defied John Scott's art; and the faded sign, which still creaks over its public house door, shows that the village were duly mindful of the honour of his stay. The range of the Hambleton hills, where he won his fatal trial against The Colonel, before the St. Leger, rise bleak and bare on the left; and when they stand out, on a clear day, Warlabby seems, from the distance, to nestle almost in a hollow beneath their shade. A glimpse of Sir Samuel, arrayed in a huge anti-gate-opening head-gear, and grazing amid the cows on the pasture of Bamiston Hill, which looked as green as if it was summer, first told us that, leaving Velocipede's, we had reached the Crown Prince's dominions at last; and two or three hundred yards more, down a now leafless lane, brought us to Mr. Booth's door.

The Warlabby land lies close round the house, and consists of 310 acres, about half of which is in tillage, and half in pasture; and ever since Mr. Booth came there, he has had the luck wholly to escape the pleuropneumonia, and to lose only one cow from the "mouth and foot" disease. The latter was most fitful and stealthy in its attack. Mr. Booth had no idea of it till a special messenger arrived, post haste, at the Thirsk Show-yard, a few hours after he had left home; and while the cows only separated by a lane from the invalids escaped altogether, it seized others full a quarter of a mile away. The herd, including the bulls not at home, consists at present of about eighty head; and from fifteen to twenty calves are dropped every year. Mr. Booth had twenty-six bulls, of which sixteen were by Crown Prince, out at hire last season, at all prices from 100 gs. to 250 gs.; and an eminent Yorkshire breeder bid 300 gs. for Crown Prince in vain. Some go at eleven months; and the season now lasts for a year, instead of nine months, as formerly. The expense of their sending and return is shared between the letter and the hirer; and in spite of the perpetual shiftings, very few accidents occur. Misfortune, however, vented itself on the renowned Buckingham, as he

and his attendant were burnt to a cinder on the steam-boat as they drew near to Ireland. The man whom Mr. Barnes had sent specially to fetch him was last seen holding on to the head of his bull, whose death-bellow fairly echoed along the shore; and although he was besought to leave him, he preferred to die at his post. The Monk, by Leonidas, who goes back in direct succession to the famous Halmaby, has not revisited Warlabby for seven years. The Hon. Noel Hill had him for two seasons, and then he went to Mr. Kearney's, of Ireland, for four more. Mr. Booth's business with the sister-isle is by no means of recent date, as he sent them bulls from his Studley Herd; and at present Messrs. Barnes and Challoner, of Co. Meath, give him 250 gs. for Harbinger, who is the ninth they have had from the two brothers in succession. Vanguard was away at Mr. Torr's for seven seasons, as successor to Leonard and Barou Warlabby, who spent five in those quarters; and Hopewell has arrived back from Aylesby, after a six-season absence, four of which he spent in the "happy pastures" of Meath, where he has left a host of Royal winners. He was rejected, along with the whole of the bull class, as being of "no merit," at the Norwich Royal; whereas one of his companions in the ring was sold soon after for 150 gs., while he himself has produced about 1,000 gs. for seven seasons' hire. Royalty is also among Mr. Booth's customers. The Prince Consort hired Prince Alfred, in 1855—57, for his Home Farm; and then he crossed the Channel for a season to the Emperor of the French, and Fitzclarence, by Clarence, out of Nectarine Blossom, was installed at Windsor in his stead.

When we had learnt these details, the sun shone out at last, and beckoned us into the pasture; but we were not to be denied one glance round the room, and hearing a few words to the illustrious herd members, dead and living, which lent life to its walls. Above the side-board, on which rested the massive North Lancashire Challenge Cups which they won at Burnley, for the best female and male in the yard (Colonel Towneley, the donor, declining to compete) hung Bridesmaid and Windsor, and a small engraving of Faith, by Raspberry, divides them. She might well hold the post of honour, as, crossed with Leonard, she produced Hope; and from Hope and Buckingham came the renowned Charity, who was never beaten, except as a calf, by one of the same herd. Her greatest Royal triumph was when, as a three-year old, in 1849, she was placed A 1 in the cow class at Norwich; and she bred her first calf, in the shape of Crown Prince, that modern Comet of Warlabby. Mantalini, the winner of ten prizes, hangs on the adjoining wall. From her sprang the twins Polka and Pelerine; and it is from the latter that Rose of Athelstane traces her descent, through Rose of Summer and Rose of Autumn.

The third oil-painting in the room is a large one of a somewhat coarse roan bull, Navigator. He lived and died in days when agricultural shows were quite in their infancy; but he was the winner when Mr. Richard Booth's uncle, Major Bower of Welham, (who sold Sir

Charles Knightley, his wonderful cow Valuable, by Defender (194) in 1822), took up Mr. Stapleton's challenge to show their bulls for £50 a-side, in Duncombe Park. Little prints of Necklace and Bracelet, from the original paintings at Killerby, over which we have so often pondered as we sat, and as often decided the knotty point of precedence, on the score of more length, for Bracelet, are ranged on each side of it, and Cherry Blossom is not forgotten. We miss Buckingham, but need only look outside for the ratification of the wise decision of the late Mr. John Booth, to send Bracelet to Musulman, and have a cross of Col. Craddock's rare "old Cherry tribe." Eight medals, a very small proportion of those which have reached Warlabby from Hanoversquare or the Yorkshire Society, alone are ranged on the chimney piece; but the mind naturally reverts to more solid testimonials, £25 and £15 cheques to wit, signed by Secretaries, and, after glancing at the contents of one or two cases, we pass the others by.

And so we leave these relics of the past, and with Mr. Booth and Cuthbert, alias "Cuddy," as our cicerones, we saunter out on to Banniston Hill. The Ainderby steeple shows boldly out in the distance, right above the rushy level, where the herd "wander at their own sweet will," in the summer heat, and where, to judge from the frequent gun flashes, jack snipe betake themselves in winter. "Cuddy" is to the Yorkshire short-horns, what Sir Tatton Sykes's Snarry is to its thorough-breds. He has grown grey in Mr. Booth's service, and as he stands there, proudly telling of each cow to the seventh generation he has reared, in his wide-awake, his brown jerkin, his red and purple check handkerchief, twisted, hay-wisp fashion, round his neck, and grasping an aged hunting whip, we see no reason, either on the score of memory or ailment, to believe in his foreboding of "*I may be done, any time now.*" Satin, the old dame of the herd, and some three or four months beyond fourteen, was strolling over the hill and far away to the right as we entered the field, and hence the red Vivandiere, by Buckingham, who is not many weeks younger, was the first we came up with. Her remarkably nice head and eye are her most taking points, and she is a most undeniable milker to boot. At present Mr. Booth has three bulls by her—Prince Arthur, Prince Alfred, and Prince Oscar, all by Crown Prince, and she is in calf to Sir Samuel, who was gallantly grazing at her side. This son of Charity was in Ireland last year; but although he is rather on the leg himself, his stock are showing so well, that Warlabby is not unlikely to be his permanent sphere for the future. Princess Elizabeth, the dam of Queen of the Isles and Lord of the Isles, is heavy in calf to him. She was never in a show-yard, but she has, by her queenly daughter's triumphs this year, placed herself almost A 1 among the herd. Chastity came next; but we were more struck with the white four-year-old sister to Windsor, who had all the character of her distinguished brother—very neat and level, and with rare round ribs. Our remembrances of Queen of the May, Queen Mab, and Lord of the Valley, made us look out very anxiously for Crown Prince's constant

consort, Red Rose, by Harbinger, for whom a few years since a blank cheque was offered in vain. She is a neat and a very sweet-headed cow, of less size than most of the others, but true as a die in shape; in fact, a model of milking properties, combined with quality, and a very regular breeder.

Leaving the field, and wending our way through the goat, some choice geese and Rouens, and some half-Dorking half-game fowls (for Mr. Booth "likes nearly everything on the farm half-bred except short-horns"), we took the yard sheds in succession.

A white bull-calf, Royal Bridesman, by Crown Prince, out of Bride Elect, with a somewhat prominent Vanguard head, stood first for view; and near him was Campfollower, a daughter of Crown Prince and Vivandiere, who had just calved a heifer-calf to Windsor. In the first box in the larger yard, was a red-and-white November calf, Queen of the Ocean, sister to Queen of the May and Queen Mab, and bearing, except in her colour, a strong family likeness to the latter; while The Soldier's Nurse, with a wondrous bosom, own sister to Campfollower, shared its bed. We were musing on Royal Shows to come, when Crown Prince and his guardian drew up for inspection at the gate. He has never been shown, as they dare not make him fat; but he retains all the fine form of fore-quarters, in spite of being so poor. As a bull-getter, he is especially famed. Mr. Torr had him for a season at Aylesby, and sold six calves by him for 80 guineas each. Mr. Booth has also recently refused an offer of 100 gs. to send four heifers to be bulled by him, and to take a bull into the bargain; but it transpired, as if by way of contrast, as we stood by a shed, waiting for the victorious Nectarine Blossom and her fair friends, that one of the six half-Scot and half-Irish beasts in the stalls behind us owned him for her sire!

And now the grouping began in earnest; as Bride Elect, Nectarine Blossom, and Queen Mab came forth together. "Cuddy," with a strong eye to the picturesque, had disposed two calves in the back-ground, and Mr. Booth pointed them specially out to us, but they never got on to our notes, and we don't know to this day what they were. Their three seniors were quite enough to fill the eye at once. The white Bride Elect, by Vanguard, out of Bianca, was twice beaten by Col. Towneley's Roan Duchess, though she beat her at last. Her show days are over, and so far she has only bred Bridal Flower and Royal Bridesman, but she is in calf to Crown Prince. Her breast is so splendid, that it almost requires a second pair of fore-legs to support it; and as she stood fore-shortened, with her two companions near her, we longed for a cunning pencil or camera to hit them off for ever and aye. Queen Mab, who unites rare quality and substance, and was second at Northallerton, to Mr. Douglas's Queen of Trumps (who was sold for 450 gs., and died within a day's sail of New Orleans) has had a roan heifer-calf to her sire Crown Prince, which unfortunately died. She measures eight feet behind the shoulders, just half-a-foot less than Nectarine Blossom, to whom she is universally allowed to bow in elegance of form; and, but that the other is a trifle

too large in the hips, it is almost impossible to pick a hole in her. Nectarine Blossom has just had a bull-calf to Sir Samuel, which makes her third; but her half-sister, Orange Blossom, seems by no means inclined like her

“To lift her head for endless spring
And everlasting blossoming,”

as she did not hold, in December, 1857, and never took the bull again for thirteen months. Mr. Booth forgot to introduce us to a very promising bull-calf by Windsor, out of Blithe; and we did not see Lady Grace, and four yearling heifers, which were in a field at some distance from the house.

For a little change, we adjourned once more to the bulls, and first and foremost had an audience with Hope-well, own brother to Charity, who has lately had a severe fall from a cow. The young Lord of the Valley, a very stylish bull, of more substance, though perhaps not so true-made as Crown Prince, then stood forth. He has just been transferred over from Mr. Carr's (where Windsor has taken his place at a 200 g^s. hire) to Mr. Willis, near Middleham, and hence there will never be a return-match between him and The Great Mogul. Gradually descending on the age scale came the roan Sir James, by Sir Samuel, out of Nectarine Blossom. He won at Sunderland last year, but he is to be rigidly kept for “what surpasseth show” in Mr. Booth's eyes. We measured him six feet five already, and he is also a wonderful toucher, though not to call handsome, and inferior in this point to his half-brother Fitz-clarence.

And so we strolled on, and for a wind-up took a look at three Queens in succession. There was Queen of the Vale, especially good behind the shoulder, and ready no doubt, after a winter's reflection, to try issues with the two Roses—Stanley Rose, and Rose of Athelstane, who defeated her at Sunderland and Northallerton; and

Moss Rose from Wetherby into the bargain. Be that as it may, her sister, Queen of the May, has had enough of such honours, and has fairly broken down in training. The mischief began when she was sent with Sir Samuel in a horse-box to Chelmsford, and stood up all the way, hour after hour, till nature almost gave in. She still retains all that beautiful form of fore-quarters, and rare length, which “knocked over” the judges so often; but she is now only a splendid ruin, slightly down in one hip, and seems, for fear of throwing too much weight on to her fore-legs, to stand at times arched like a bow. She was kneeling in the pasture when we first saw her, and had eaten the grass bare in a sort of elfin ring round her, and she had hardly walked a hundred yards to her box, than she favoured herself on to her knees before her hay once more. It is feared that she is not in calf to Highthorn. Many were wont to say, in 1857, when she beat Victoria and Rose of Townley and won the 100-guinea Cup at Stockton, as the best animal in the Show (an honour which fell on Nectarine Blossom last year), that she was the finest young animal that ever walked out of the Warlaby yard. We think they are right in not transferring their allegiance to the present plum of the herd, Queen of the Isles, by Crown Prince, who was brought out for us last. To our eye she is quite as wealthy, but with hardly such beauty or length as Queen of the May. She was unbeaten as a calf at York and Stockton, and then swept the three prizes in succession at Chester, Northallerton, and Sunderland. If she is never shown again, it will be her proudest memorial that, when Mr. Booth had nothing else to send, Col. Townley's “Diadem,” and Mr. Grundy's “Sweetheart,” and thirty others entered the lists in vain against her on The Roodce. We know we are correct as to the number, for Cuddy, in the honest pride of his heart, “counted them a vast of times to be suir.”

D.

THE EFFECT OF CERTAIN MANURES ON PLANTS.

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

That certain manures produce very powerful effects on the growth of particular plants was an early remark of the cultivators of the soil. This observation, indeed, laid the foundation of the art of manuring; led the way to the triumphs of modern chemistry, and of the agriculturists of our time. It is hardly a doubtful question, however, that much yet remains to be done in adapting the manure to the particular plant whose growth we intend to promote—varying the application, as the straw or the seed of the plant is the proposed crop.

If we dwell a little upon the readings in this page of Nature's book, we learn many things which have from time to time presented themselves for our instruction. The natural grasses here speak in very

plain language. The farmer has noticed, from time immemorial, that, on the sides of roads, and other turf-clad places, the ashes of a wood fire, left perhaps by some wayfarer, produce on the site a patch of white clover. Wood ashes, therefore, evidently promote the growth of this plant. Now, as wood ashes abound in phosphate of lime, it was soon considered probable that this is the salt which promotes so remarkably the growth of the clover. Later experiments very considerably supported this conclusion. The use of crushed bones, which still more copiously abound in phosphate of lime, was found to produce a similar effect. The use of bones on the farms at Welbeck and Clipstone, half-a-century since, caused so remarkable and so “spontaneous” a growth

of white clover, that the late Duke of Portland considered it unnecessary to sow the seeds. The farmers of the north-eastern side of our island, who had remarked the same thing, began even to suspect that the seeds were imported in the crushed bones of Holland. That the portion of the bone which is thus so decidedly the food of clover is its phosphate of lime, and not its decomposing organic matters, seems to be also evidenced by several facts. One of these has very recently been given by Mr. J. Dixon, in his prize essay on the manuring of grass land (*Jour. Roy. Ag. Soc.*, vol. xix., p. 204). He there remarks, "Of the permanent power of the raw bone I can instance a case on land of which I was the tenant for sixteen years: it was old turf, and had been in the occupation of the proprietors for a long time previous to my becoming tenant. The extent of the land in question was little more than twenty acres. About the year 1790 the then proprietor had all the bones he could obtain in a commercial locality collected together, and broken with a heavy hammer. No account was kept of the quantity or value used on a given surface, but there is sufficient evidence to show that an unusual dressing was given.

"The soil is of a close, tenacious character, lying on a clayey subsoil. The subsoil did not contain calcareous earth; at least, it did not effervesce with the spirit of salts (muriatic acid). Some parts of the land had a more porous substratum, and were sufficiently dry for pasture: these particular parts were undoubtedly the most fertile land in the district. Such of the surface as was wet had scarcely any other vegetable covering than the carex and others of the coarsest grasses. It is perhaps proper here to state that this bone-dusted land has not been broken-up or in tillage for a very long period. On becoming tenant, I immediately set about draining the wet parts. In this operation we found, at from five to eight inches from the surface, much bone, in various states of decomposition: the large pieces, when broken, appeared fresh inside. I felt at the time some regret that much value must have been lost for many years, and, as I then supposed, for ever lost, on account of the manure having been in a soil saturated with water ever since it had been laid on. However, before my draining operation had been completed twelve months, the coarse herbage began to disappear, and in its place appeared white clover, marl clover, and others of the best pasture grasses; and, in the second summer after being drained, the soil was equally luxuriant with the naturally dry parts of the land. It is now nearly seventy years since this land was boned, and it is still markedly luxuriant beyond any other grass land in the same district."

And in a subsequent page, when alluding to the

boning of the grass land of Mr. Williamson, of Tarpoley, Mr. Dixon observes, "Previous to boning, the herbage on these pastures was of the poorest kind imaginable—there being few of any plants except the small carex. In the second summer after boning, the carex had disappeared, and the pasture had become long and thick-set with white clover, cow grass, or marl clover, and trefoil."

Other and still more carefully conducted experiments serve to show the value of such a field of enquiry. It is only in the just-published half-volume of the *Journal of the Royal Agricultural Society*, p. 552, that the experiments of Mr. J. B. Lawes and Dr. Gilbert with different manures on permanent meadow land have been reported. In these trials, which were carried on during the years 1856, 1857, and 1858, the plan adopted was to apply a number of different combinations of manuring substances, each, year after year, to the same plot of land. And, in order to provide proper standards of comparison, two plots were left continuously unmanured, and another portion was annually manured with farmyard manure. The land selected comprised about six acres of the park at Rothamsted, and it had been under permanent grass for certainly more than a century. The land is a somewhat heavy loam, with a red-clay subsoil resting upon chalk, and is very well naturally drained; the area selected is perfectly level; and no *fresh seed of any kind* has been sown, either within the period of the experiments, or for many years previously. Early in 1856 nine plots, of half-an-acre each, were measured off for artificial manuring: two plots of a quarter of an acre each to be left unmanured; and two other plots of a quarter of an acre each to be manured annually with farmyard dung. In 1858, four other plots of one-sixth of an acre were appropriated to trials with nitrate of soda. The result upon the produce of hay by the fourteen different applications will be found in the following table, which gives the manures applied, and the average produce of hay during three years, in tons, hundred-weights, and quarters. The manures were applied broadcast from the middle of February to the 31st of March; the nitrate of soda, in April; the farmyard dung and the sawdust, in the previous November or December:—

	tons.	cwts.	qrs.
1. Unmanured	1	3	1
2. Unmanured (duplicate plot at the further end of the series)	1	4	2
3. 2,000 lbs. sawdust	1	0	2
4. 200 lbs. each sulphate and muriate ammonia (good samples of the salts so named in commerce)	1	15	0
5. 2,000 lbs. sawdust, and 200 lbs. each sulphate and muriate ammonia	1	15	0

	tons.	cwts.	qrs.
6. 275 lbs. nitrate of soda (one year)	1	11	3
7. 550 lbs. nitrate of soda (equal in nitrogen to the ammoniacal salts of plot 4). (one year)	1	11	3
8. Mixed mineral manure, composed of—			
Superphosphate of lime :			
200 lbs. bone ash	}	1	13
150 lbs. sulphuric acid *			
300 lbs. sulphate of potash			
200 lbs. sulphate of soda			
100 lbs. sulphate of magnesia			
9. Mixed mineral manure, as plot 8, and 2,000 lbs. sawdust	1	15	3
10. Mixed mineral manure, as plot 8, and 200 lbs. each sulphate and muriate ammonia	2	19	1
11. Mixed mineral manure, as plot 8, 200 lbs. each sulphate and muriate ammonia, and 2,000 lbs. sawdust	2	18	2
12. Mixed mineral manure, as plot 8, 200 lbs. each sulphate and muriate ammonia, and 2,000 lbs. cut wheat-straw	2	14	0
13. Mixed mineral manure, as plot 8, and 400 lbs. each sulphate and muriate ammonia	3	3	2
14. Mixed mineral manure, as plot 8, and 275 lbs. nitrate of soda (one year)	1	17	3
15. Mixed mineral manure, as plot 8, and 550 lbs. nitrate of soda (equal in nitrogen to the ammoniacal salts of plots 4, 10, &c., (one year)	2	10	1
16. 14 tons farmyard dung	2	0	0
17. 14 tons farmyard dung, and 100 lbs. each sulphate and muriate ammonia	2	8	2

The result of these varied applications, in inducing the growth of different kinds of grasses, is thus summed up by the institutors of these valuable experiments: That the effect of a mixed, but purely *mineral manure* upon the complex herbage of permanent meadow land was chiefly to develop the growth of the *leguminous* plants (clovers &c.) it contained, and scarcely to increase at all the produce of the *graminaceous* plants, or commonly called *natural grasses*. That the action of purely nitrogenous manures upon the permanent meadow, was to discourage the growth of the *leguminous* herbage, and to increase the produce of the *graminaceous* hay.

That by the *combination* of both nitrogenous and proper mineral manures, the produce of *graminaceous* hay was very much increased. In the particular soil and seasons in question, the increase obtained by the combination was far beyond the sum of the increase yielded by the two descriptions of manure, when each of them was used separately.

That *farmyard* manure gave a considerable increase of chiefly *graminaceous* hay. In the soil and seasons in question, however, the artificial combination of nitrogenous and mixed mineral manure yielded a very much larger increase than an annual dressing of 14 tons of farmyard manure.

That peculiarly *carbonaceous* manures had little or no beneficial effect on the amount of produce of the hay. That the little effect (if any) which the carbonaceous manures did exhibit, seemed to be favoured by admixture with mineral manures; and then (as when the mineral manures were used alone) it appeared to be the leguminous, rather than the *graminaceous* herbage, that was encouraged.

That the beneficial action of farm-yard manure on the grass crop is to be attributed chiefly to its *mineral* and *nitrogenous* constituents, and comparatively little to its large amount of carbonaceous substance.

That the large increase of produce obtained by the combination of nitrogenous and mixed mineral manure, being almost entirely *graminaceous*, the mineral manures, when in this combination, did not act as when used alone, in developing the highly nitrogenous *leguminous* herbage. The great increase in the produce of hay obtained by the conjunction of the mineral with the nitrogenous manure is to be attributed to the supply, within a limited range of the soil, of a sufficient amount of the necessary mineral constituents, to enable the *graminaceous* plants to turn to the account of growth the nitrogen at the same time artificially supplied.

The very agrarian weeds, which haunt as it were the footsteps of the farmer of arable soils, seem also to show the influence of manure on the growth of certain plants. Every cultivator is aware of these things. He sometimes, however, may have assigned to one cause, what more properly belongs to another. Professor Buckman has given some excellent notices in more than one of his valuable papers on the Natural Grasses. Thus he remarks (*ibid*, vol. xvi, p. 365): "Chickweed, sandworts, groundsel, spurge, and dead-nettles are nowhere found in unbroken grounds; but in land newly brought under tillage, they soon make their appearance." And in the next page he adds: "But there appears to be a most important point connected with agrarian weeds, namely, that weeds common to good cultivated soil appear to possess some of the most important chemical principles in great quantities." The mere reference to the analysis of some of the most common weeds proves the truth of this assertion. Mark, for instance, the large amount of phosphoric acid which the ashes of some of these contain. The stem and leaves of the ivy-leaved speedwell 14.0 per cent., of its seeds and capsules 44.0, the seeds of the dandelion 41.9, the whole plant of the corn cockle 7.2, and of the greater celandine 15.7 per cent.

* (sp. gr. 1.7)

Now is not the early attention of the farmer of newly cultivated soils directed to their enrichment, by adding to them manures containing phosphoric acid? and may we not conclude that this addition enables such agrarian weeds to "spontaneously" appear? On a future occasion I hope to be able to extend my observations upon the action of manures to other cultivated crops, and to report the result of a series of experiments, which I have instituted on the spontaneous production of certain plants, by various chemical substances.

The instances which I have given of this very curious growth of certain plants, might be copiously extended. Several marine plants are found near some of the German salt springs, and even around the saltworks of Cheshire and Poland. The nettle and one or two other plants are found near to places where saltpetre is generated.

This inducement of the "spontaneous" growth of plants, by applying certain substances to the soil, is then, we must all conclude, neither a novel observation, nor one which should lead us to adopt erroneous conclusions as to the origin of plants, however startling the phenomena which attends our walks. The farmers of some of the rich soils of the hundreds of Essex, for instance, if they plough beyond a certain depth, insure the growth of a profusion of white mustard. We have already remarked that the site of a fire becomes speedily tenanted by totally different plants from those growing around the spot. Liebig alludes to other instances of a similar kind (*Organic Chem.*, p. 152). It seems that after the Great Fire of London large quantities of the *Erysi-*

mum latifolium were observed growing on the spots where a fire had taken place. On a similar occasion the *Blitum capitatum* presented itself at Copenhagen, the *Senecio viscosus* in Nassau, and the *Spartium scoparium* in Languedoc. After the burning of some of the American forests, poplars grew spontaneously on the same land. It may be very true that these things are very inexplicable to us, who do not see the seeds of plants conveyed by the winds or birds from place to place, or perceive the seeds when they are in the soil; but it is worse ignorance to explain unknown facts by merely arriving at such absurd conclusions as that the seed is *generated* in the soil by certain imaginary agencies. Such an *explanation* is never offered to account for the appearance of a tree or an animal in unexpected places; and yet the remark would be just as correct if it was applied to a colt or a baby, as to a plant of white clover.

The power of the atmospheric currents, of insects, and of the larger animals, in diffusing small seeds, is but little understood by us. What minute seeds of vegetables are carried up into the atmosphere by strong currents of air; what force those winds possess, in this way, at great heights, is little imagined; and there are, most probably, other modes of seed dispersion arranged by Infinite Wisdom, with which we are entirely unacquainted.

We may then well abstain from deceiving ourselves with such explanations of the "spontaneous" growth of plants, which are, in fact, merely substituting another set of words for an equally unmeaning conventional phrase.

THE UTILIZATION OF WASTE SUBSTANCES.

In a paper recently read before the Society of Arts on the Utilization of Waste Substances, by Mr. P. L. Simmonds, attention was prominently drawn to the importance of this matter by the many new industries which have sprung up, and the large profits which have been made by vigilant attention to small matters, and the application of some formerly waste substance to a useful purpose. The paper was full of curious details and suggestive information. It pointed out the enormous reconversion of wool now carried on, by tearing up old worn clothes and combining them with a portion of new wool. Shoddy seems to be more generally made than we had reason to suppose; and hence we cannot wonder that our tailors' bills become heavier, and that our garments are less durable, since it is scarcely possible for the unpractised eye to detect a genuine good broadcloth from a shoddy. No wonder that the old clothes shops and the rag shops are increasing so rapidly, since there is such an extensive casting-off of garments which become shabby and unwearable in a remarkably short space of time! A

speaker at the meeting gave a laughable instance of this; for he said that occasionally in putting on new stockings his feet went completely through them! and very many of the woollen garments made and sold, after the first shower of rain materially alter in aspect, and look anything but respectable. The waste merchants and the rag grinders—now special trades in the woollen districts—no doubt make their profits at the expense of the customer; and we learn that in the town of Leeds the rag machines engaged in this reconverting trade add to our annual stock of wool the equivalent of the fleeces of 400,000 sheep.

Apart, however, from these fraudulent or deceptive reconversions of waste material, which are mainly due to the popular desire for cheap goods, there are very many highly important applications of labour and skill to the utilization of waste products. For instance, the conversion of old woollen and cotton rags into paper; the manufacture of waste silk; the application of sewage manure; the refuse of the fisheries, and such like, are all important.

It is not with these, however, we propose now to deal. We would rather call attention to the numerous insignificant substances which have been or can be utilized, that lie waste and idle around the cultivator at home and abroad. The refuse of manufactories we need not now allude to: science has its eye on these, and very soon converts them to a useful purpose. But if we look at the numerous new uses for straw and flax waste, peat and grasses, we find a large field open. Straw paper is now an important manufacture, and paper from flax waste promises to use up another refuse product.

Mr. Simmonds pointed out hundreds of applications of substances not perhaps familiar to every one. He tells us—"The twitch or couch grass, which has hitherto been such a troublesome weed to the farmer in clearing his land, is now turned to several useful purposes. In Italy it is used as food for horses and cattle. Colonel Maceroni, in his Memoirs, states that upwards of £40,000 sterling worth of this root is annually sold by the peasants to the inhabitants of the city of Naples. In France it has a medicinal repute under the name of dog's tooth. It has been tried as a material for paper, and is collected in large quantities in the fen districts, and sold to the papermakers at 12s. a ton, instead of being dried and burnt as heretofore. The sweepings of our cotton and flax-mills, the outside wrappers of the cotton bales, however discoloured or dirty, the weeds of our fields, thistles and couch grass, the stalks of reeds and canes, sawdust and pine-shavings, the refuse of the Irish flax scutching mills, moss and furze, our cast-off garments, the beggars' rags, old sacks, and worn-out ropes, all of which we should be troubled to dispose of, are converted by the papermaker into an article indispensable to civilized man. The dry residue of the beet root, after expressing the juice for sugar, consists chiefly of fibre and mucilage, and amounts to about one-fourth of the weight of the clean roots used. It is greedily purchased by the farmers on the continent, and also the skimmings of the boilers, which are found to be a powerful manure. It is also useful as food for cattle. The recovery of starch from rotten potatoes, and damaged grain, and refuse rice, is a utilization of waste substances; and this has been carried further still to advantage in the employment of horse-chesnuts for the purpose. The French make good coffee out of roasted acorns, and there is yet abundance of scope for experimental research upon new roots and seeds. Horse-chesnuts, which have hitherto been a waste substance, are now utilized by removing the bitter principle, and excellent starch, as well as vermicelli and macaroni, are made from them in France. The following is a plan of making flour from them. Grind the horse-chesnuts, and mix with the pulp carbonate of soda in the proportion of one or two per cent., and then wash the produce until it is perfectly white: 1lb. of carbonate of soda will purify 100lbs. of horse-chesnuts, and produce 60lbs. of flour fit for bread, as the salt removes the bitter principle from the nut. In Saxony great care is taken to collect the horse-chesnuts, which are regarded as a wholesome aliment for sheep, and a specific against the rot: these are given to the sheep

in autumn when the green food ceases. The chesnuts are cut into pieces, which it is dangerous to omit, as they might otherwise stick in the throat of the animal, and cause its death. Sheep, as well as cattle, refuse at first to eat this food; but when accustomed to it they seek it with avidity, and even like to eat the prickly husk in which the nut is enveloped."

In the United States a large trade is carried on in the cultivation of an article termed "Spanish moss"—a kind of epiphyte attached to trees in the woods in Mississippi, Texas, and other quarters. It is prepared as a substitute for horse-hair, &c., as a stuffing material for upholstery purposes. This substance possesses considerable elasticity, and may be had in any quantity, at a comparatively small price.

The fibrous husks or leafy covering of the ear of maize is extensively used for stuffing mattresses; and will not harbour vermin. It is also used for packing fruit and cigars, and as a paper material.

In New Brunswick they collect the leaves of the beech in autumn; and, from their elastic quality, they make better stuffing for palliasses than either straw or chaff, and last seven or eight years.

The riband-like leaves of the *Zostera marina*—known in commerce as *Ulva marina*—make admirable stuffing for mattresses and cushions, as they repel all vermin. They are used for the same purposes in the Levant, and the twisted rush-like covers of the Florence flasks are formed of them.

But there are many other substances even not enumerated by Mr. Simmonds, which give extensive employment, and turn to profitable use waste substances.

The manufactures of baskets, crates, hampers, and chairs of osiers, rushes, straw, or other substances, employ at least 12,000 persons in this country, the entire British manufacture being estimated at over a quarter of a million sterling. But in many countries mats and baskets for packing, are even more important than here. We imported, it is true, mats and matting to the value of about £20,000; but in countries where a light baling material is an object in transport, mats are very extensively used for wrapping goods, especially in Russia, in India, in China, in the sugar and coffee producing colonies. For packing or pressing grapes, olives, figs, and dates, they come largely into use.

Rushes are imported from Holland to the extent of many thousands of bundles, for seating chairs, polishing woods and metals, and other uses. The quantity imported in 1857 was 547 tons, valued at £4,485.

The quantity of palm-leaves imported from Cuba, for making hats; of piassaba fibre (the foot-stalks of the leaves of a palm) from Brazil, for making brushes and street-sweeping machines; of kittool (another palm-leaf fibre, from Ceylon, for making stout clothes and other brushes; and of coir, the fibrous husk of the cocoa-nut, is now very considerable—and these were formerly all waste and unappreciated substances.

Take, again, the simple articles of brooms and sweeping-brushes made of grasses, rushes, birch, &c.; what an extensive trade is carried on in them! Im-

mense quantities are made in Southwark, in the neighbourhood of Ulverstone, and in North Wales, of heath and birch. In the United States the manufacture of brooms from a species of millet-stalk, termed "broom corn," has now become an immense trade; and they are shipped to European and Australian markets, and even to California. One firm in Albany ships 80,000 or 90,000 dozen annually: they are principally made in Schenectady, New York State. In the Turkish town of Adrianople as many as half a million dozen of brooms are sold annually, at 3s. a dozen. In Sardinia there is a large manufacture of brushes from the trilobo, or Piedmontese heath sprigs.

Plaiting of straw, grasses, and chips into hats and different articles for wear, is far from being confined to Europe or to civilized countries. The art is indeed found to obtain, in different degrees of extent and excellence, in nearly every part of the world. In the southern provinces of China, where in summer the population use no other head-covering, and where the mandarins wear those hats with tremendously wide brims, the quantity of straw plaited is prodigious.

"When on a journey," says Thunberg, "all the Japanese wear a conical hat, made of a species of grass, plaited, and tied with a string." But, in addition to this extensive use, the Japanese hardly ever wear any shoes or slippers but such as are made of plaited rice-straw. They cost a mere trifle, are found exposed for sale in every town and village, and the pedestrian supplies himself with new shoes as he goes along, while the more provident man always carries two or three pairs with him for use, throwing them away as they wear out.

These details, in connexion with a perusal of the paper we have referred to, which is ample and instructive in its details, will serve to impress upon us the importance of treating nothing as insignificant. If a dust-heap has been given as a noble fortune by a father to his daughter; if a waste collector in Paris can retire with a competency, in a few years, from his gains; and if a bone-dealer in our own metropolis can make a princely income out of the utilization of this waste, there is scope enough for others to enter upon the wide field, inviting industry, thought, and skill.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A MONTHLY COUNCIL was held on Wednesday, the 2nd of February. Present: His Grace the Duke of Marlborough, President, in the chair; Lord Walsingham; Lord Feversham; Lord Leigh; Sir Charles G. Morgan, Bart.; Hon. Col. Nelson Hood; Hon. W. G. Cavendish, M.P.; Mr. Dyke Acland; Mr. Amos; Mr. Raymond Barker; Col. Challoner; Mr. Brandreth Gibbs; Mr. Fisher Hobbs; Mr. Wren Hoskyns; Mr. James Howard; Mr. Hudson, of Castleacre; Mr. Wm. Hutton; Mr. Lawes; Mr. Lawrence; Mr. Milward; Mr. Pain; Mr. Pope; Mr. Shuttleworth; Prof. Simonds; Mr. Slaney, M.P.; Mr. Banks Stanhope, M.P.; Mr. Thompson; Mr. Torr; Prof. Voelcker; Mr. Jonas Webb; Mr. Wilson, of Stowlangtoft; and Mr. Fuller Maitland Wilson.

The following new members were elected:

Amhurst, W. T. Amhurst, Duddington Park, Brandon.
 Auderton, George, jun., Howden, Yorkshire.
 Bridger, W. H., Sycote Manor, Tamworth.
 Baker, James, Drayton Bassett, Tamworth.
 Barbor, Robert, Bolesworth Castle, Tattenhall, Cheshire.
 Bloomer, G. B., Moreton Hall, Chirk.
 Brooks, J. Marshall, Mosley-street, Manchester.
 Brown, George, Riborough House, Barnstable.
 Bushell, Thomas Richard John, 117, Crawford-street, London.
 Byrd, Sampson, The Leese Farm, Stafford.
 Canning, George Henry, Slattery, Stratford-on-Avon.
 Chapman, William, Cornhill, Ipswich.
 Cordey, Edward, 24, Tooley-street, London.
 Crofts, Thomas William, Lawford Hill, Rugby.
 Denchfield, John, Aston Abbotts, Aylesbury.
 Devas, Horace, Alvaston Field, Derby.
 Devas, Charles Frederick, Bromley Lodge, Kent.
 Dix, George W., Howden, Yorkshire.
 Green, Richard, Knighton, Radnorshire.
 Griffin, Alfred William, Pell Wall Hall, Market Drayton.
 Hyter, Tom John, West Woodgate, Salisbury.
 Hurlstone, William, Heathcote, Wasperton, Warwick.
 Johnston, John Lindsay, Crondall, Farnham, Surrey.

King, John G., Beever, Newbury.
 Lane, John, Broom Court, Alcester.
 Legerton, John Stock, Shelford, Braintree.
 Moore, Thomas William, Warham, Wells, Norfolk.
 Morris, Thomas, jun., Walcot Field, Lutterworth.
 Pain, John, Popbottom, Basingstoke.
 Plant, T. Berley, Sheffield.
 Pettenson, Captain W. H. T., Ibornden, Biddenham, Bedford.
 Riley, Luke, Meriden, Coventry.
 Rist, Isaac, Tattingstone, Ipswich.
 Rogers, John Pope, Penrose, Helstone, Cornwall.
 Root, William, Chipping Warden, Banbury.
 Sharpe, William, Mavis Enderby, Spilsby.
 Stedman, Joseph, Hall Green, Birmingham.
 Stoneham, Frederick, Crayford, Kent.
 Strickland, J. W., Joyce Grove, Henley-on-Thames.
 Sladen, St. Barbe, 4, Cranley-place, Brompton, Middlesex.
 Schraun, Frederick Sigismund, North Houghton Manor, Stockbridge, Hants.
 Scoones, Henry Basham, Fowle Hall, Brechley, Kent.
 Spofford, Edward, Boothby Graffoe, Lincoln.
 Starkey, Major, Wrenbury Hall, Nantwich.
 Tauer, Joseph, Mudford House, Christchurch, Hants.
 Thomas, Edward, The Farm, Bleddfa, Knighton, Radnorshire.
 Townsend, Henry, Rydinghurst, Cranley, Surrey.
 Worsley, John, Lower Clopton, Stratford-on-Avon.
 Wallington, George, Little Hill, Wellsbourne, Warwickshire.
 Watson, Charles, M.D., 27, Alfred-place, Bedford-square, London.
 Wemyss, Hoy, Wemyss Castle, N. B.
 Willoughby de Broke, Lord, Compton Verney, Warwick.

FINANCES.—Mr. Raymond Barker, Chairman of the Finance Committee, presented the report on the accounts of the Society, from which it appeared that the current cash-balance in the hands of the bankers was £3,026. The Chairman further reported that the authorities of Warwick had transmitted to the Society, towards the expenses of the ensuing country meeting to be held at that place, in the week commencing Monday, the 11th of July next, a subscription of £1,500, which was included in that general balance. He also laid on

the table, for the information of members, the usual quarterly statements of income and expenditure, and of assets and liabilities.

JOURNAL.—Mr. Thompson, Chairman of the Journal Committee, presented the following report, which was adopted:—

1. Vol. xix., Part 2, of the Journal is now ready, and copies laid on the table.
2. In the Miscellaneous Class (VIII.) of Essays, the prize is withheld by the Judges; but in the Essay on Liquid Manure Tanks and Under-ground Pipes for Irrigation there are some ingenious suggestions, and the Committee recommend that the author be requested to allow it to be printed in the Journal at the ordinary rate of payment.

AGRICULTURAL CHEMISTRY.—Mr. Wren Hoskyns, Chairman of the Chemical Committee, reported to the Council some suggestions for alteration in the wording of the notice for Members' privileges of chemical analysis; and detailed an interesting series of investigations which Prof. Voelcker, the consulting-chemist of the Society, was about to commence under the direction of the Committee.

WARWICK MEETING.—Lord Leigh, Vice-Chairman of the General Warwick Committee, reported their recommendation of the plan of the Show-yard, submitted to them by the Honorary Director of the Show and the Society's Contractor of Works. His lordship also reported the various steps taken by the Committee in making preliminary arrangements for the meeting. An offer made to the Council, by the Local Committee, to defray the expenses connected with the exhibition of Warwickshire cheese in the Show-yard, was referred to the General Warwick Committee for their report at the next Monthly Council. Mr. Wren Hoskyns conveyed to the Council, on the part of the County Magistrates of Warwickshire, an offer to place the Judges' House in Warwick at the disposal of the Stewards of the Society, during the period of the ensuing Warwick Meeting. On the motion of Mr. Raymond Barker, seconded by Mr. Hutton, the Council accepted this offer with their best acknowledgments.

IMPLEMENT JUDGES.—On the motion of the Hon. W. G. Cavendish, M.P., seconded by Colonel Challoner, the following resolution was unanimously adopted:—“That in future the Implement Committee shall be requested to nominate the Judges not later than the first Wednesday in June, in order that they may be able to lay before the Council on the first Wednesday in July the names of those Judges that are able and willing to act.”

VETERINARY INSPECTION.—On the motion of Mr. Milward, the Council unanimously adopted the following resolution:—“That an additional Assistant-Veterinary-Inspector be appointed; and that the Report of the Veterinary Inspectors shall be furnished to the Stewards before the Judges commence their work.”—It was then moved by Lord Feversham, seconded by Mr. Jonas Webb, and carried unanimously, that Professor Spooner, of the Royal Veterinary College, should be requested to accept the appointment of one of the Assistant-Veterinary-Inspectors at the country meetings of the Society.

PROTEST.—Mr. Milward, as one of the Stewards of Cattle at the Chester Meeting, reported that the protest lodged with the Stewards against the award of one of the local prizes for horses had received their most careful investigation: they considered the animal to be fully qualified for the prize, and recommended that it be no longer withheld, but now paid in due course to the winner. The Council confirmed this decision, and gave instructions accordingly.

MEMBER OF COUNCIL.—Sir Archibald Macdonald, Bart., addressed a letter to the Council, stating that having served five years as a Steward, he considered himself no longer as eligible for immediate active service, and he thought it would be for the benefit of the Society if his place in the Council were filled by one both willing and able to act as Steward, and make himself generally useful. His farming operations, he added, were not now of the same extent as when he first became a member of the Council, and “as the governing body of that important Society consisted of men eminent either for their ability or their position, as owners and occupiers of land, he had clearly no claim to that seat in the Council, which he then begged leave to resign.” The Council having with great unwillingness accepted Sir Archibald Macdonald's resignation, it was moved by Mr. Henry Wilson, seconded by Colonel Challoner, and carried unanimously, that the Secretary be instructed to write a suitable letter to Sir Archibald Macdonald, expressing to him the great regret of the Council that any circumstances should deprive them of his valuable co-operation, and the high sense entertained both by the Council and the Society of the important services he had rendered to agriculture.

The Council having appointed the Standing Committees for the year, adjourned to their weekly meeting on Wednesday, the 9th of February.

WEEKLY COUNCIL, FEB. 9.—Present: The Rev. L. VERNON HARCOURT, in the Chair; Mr. Fisher Hobbs, Mr. A. Majendie, Professor Simonds, and Mr. Maitland Wilson.

Captain Burgess, Secretary of the United Service Institution, transmitted specimens of guano from Shark's Bay, West Australia, and a portion of soil from the same locality, sent to England by Captain Denham, R.N., of H.M. surveying ship Herald.

The Royal Agricultural Society of Belgium announced a second trial of reapers, to be instituted in that kingdom this year.

The Smithfield Club presented a cask of wheat sent to them by the Port Philip Farmers' Society, at Melbourne; samples of which, in bags, for trial, may be had on applying at Messrs. Thomas Gibbs and Co., the Society's seedsmen, by such of the members as may feel disposed to test its merits by trial, and report the result to the Council of the Society.

Mr. S. Kitto, having returned from California with a supply of wheat from that country, offered to place it at the disposal of the Council under the condition that it should have a “fair trial.”

Captain Childers favoured the Council with an offer

to communicate to the Society any information he could afford relating to the temperature of the Island of Jersey, its physical character, and population, native and resident.

M. Carl Loeffler transmitted a work on the "Breeding of Poultry in Germany," and Mrs. Eliza Acton a copy of her "English Bread Book;" and several foreign societies their current transactions.

FARM-YARD SEWAGE.—Mr. G. Rochfort Clarke, of Chesterton Lodge, Bicester, Oxfordshire, transmitted the following suggestions:

"I wish to bring the following observations on the subject of sewerage, under the consideration of the Council of the Royal Agricultural Society. The subject has already attracted their attention; but, considering that the modern plan of conducting all sewage into brooks and rivers is causing an enormous loss of manure, and is, at the same time, polluting the waters of all parts of the kingdom at a rapidly increasing rate, it appears to me that the time has come when the subject should be made a more distinct and prominent branch of the Society's operations. The collecting and applying of sewage suitable for manure, and the preservation of the purity of water in brooks, rivers, wells, and ponds, may be advantageously treated in essays, accompanied by experiments, and followed by prizes, and in the following order:—1. The amount and value of the manure which is lost to the agriculturist: then the ill-construction of cesspools, and the difficulty of emptying them. 2. The amount and value of the manure which is lost to the agriculturist by the modern plan of conducting the sewage into streams and rivers. 3. The effect of different kinds of water on health, growth, fattening, and length of life of cattle. 4. The effect of sewage, when introduced into water, on the health, growth, fattening, and length of life of cattle. The following, amongst other prizes, might be offered:—1. For essays treating of the above subjects generally. 2. For the best mode of constructing cess-

pools, both for privies and as receptacles for sewage from drains, farm-yards, &c., whether of separate houses or villages, and for intercepting the acwage passing through existing sewers. 3. For the best contrivances for emptying cesspools and ponds, as regards both liquid and solid matter, with a view to its use for agricultural purposes. 4. For the best method of disposing of the materials when emptied out, whether in combination with other solid substances, or with water, or otherwise. 5. For the best plan of collecting the sewage of villages and towns, and of delivering the same to the agriculturist on equitable terms; keeping in view the health, convenience, and advantage of all parties, and their mutual co-operation, and their fair, rateable contribution towards the labour and expense of the operations."

Professor Simonds, in recommending that this communication should be referred to the Journal Committee, expressed his deep sense of the importance of the subject to which it related, and his assurance that many of the vital energies of breeding stock were seriously injured by their drinking polluted water.

Adjourned to February 16.

WEEKLY COUNCIL, Feb. 16.—Present: Mr. Raymond Barker, V.P., in the Chair; Hon. W. G. Cavendish, M.P.; Mr. Alcock, M.P.; Mr. Berners; Mr. Camps; Mr. W. Devas; Mr. Brandreth Gibbs; Col. MacDonall; Mr. Slaney, M.P.; Mr. Simpson; Mr. Bullock Webster; and Mr. Maitland Wilson. A letter was read from Mr. G. J. Neal, on his mode of cultivating the turnip crop; and from Mr. W. Rutherford, offering to communicate a plan he had found successful in the management of his potato crop.

Adjourned to Feb. 23.

FREE LABOUR IN 1859.

Everything we put our hand to is doomed to change. No human work is so comprehensive as to be suited to all time. No human design is so perfect as not to need amendment. Decay is a seed implanted in all our institutions; and though we are taught thus the passing character of all our plans, we seem to cling to them as infallible.

We are not pleased that our children grow beyond our control; we strive to maintain a parental power over our colonies at the hazard of fatal ruptures; we deem it heresy to pronounce those institutions and laws which have served our ancestors inapplicable to our own times. This firm decision, that "what is to be, is"—this deep-rooted attachment to old friends—this reverence for the past, is fraught with its peculiar value; a value that perhaps dominates over its inconveniences. A people that clings tenaciously to the precedents of antiquity is not very liable to those violent irruptions which ever accompany the adoption of changes for which the nation is not prepared. The movement of reform must commence individually, approving its justice to every man's conscience before it can assert its power collectively; and so by the time the people are at one with regard to the defective practice, they are prepared intelligently to adopt its amend-

ment. It is a satisfactory circumstance, that a very large majority must be united to demand a change in our laws, before such a change can be effected; and the difficulty in obtaining the change will always be the best guarantee that the change demanded is sincerely and inevitably needed.

There are, however, certain laws that oppress some classes that have not power sufficient to make known their wrongs in such a way as to excite public opinion to one of those majestic demonstrations which achieve a victory and become historical. In such cases we should recognize an injustice, and seek to remedy it without awaiting the clarion demand of a determined multitude.

Now the Law of Settlement is one of those institutions which, out of the utter change of circumstances from which it arose, should cease. Having served its turn—having performed its evil and its good, and now having none but an injurious effect, it should be amended. The last twenty years have unsettled the whole population of these isles, and settled them anew over the surface of this habitable globe. The emigrant ships and the railways have performed the work of hundreds of thousands of "orders of removal" at less expense of feelings and money both to paupers and rate-

payers. When a week's wages and twenty-four hours suffice to land a labourer anywhere he pleases in this island, and a harvest's earnings well husbanded will introduce him to a new world—when it is possible for any labourer of good character to be conveyed, with his family, at the expense of a public fund, to a region where gold and labour are only synonymous terms, it becomes little else than an extravagance of humanity or law that the country should be put to great cost to discover the proper locality of every pauper, and charge it with his employment or support. When the English labourer did answer to the title *ascriptus glebæ*—when, like a tree, or any other vegetable, he did live and die upon the spot of ground that gave him birth, such humane consideration for his care and sustenance might have been necessary. We will not now inquire as to whether the law of settlement arose from the desire of masters to keep him an hereditary bondsman to a certain locality, submissive to their terms, or whether it was intended to meet a cruel propensity to transplant the British labourer—an indication of which we nowhere find. Whatever may have been, there can be no pretext of this sort now. From the same cottage hearth, and the same class in the Sunday school, one is braving the dangers of New Columbia, another is sending supplies to us from his clearing in the backwoods of America, a third is tending sheep upon the fervid plains of New Holland, while a fourth is manufacturing broadcloth out of the wools at Leeds; and is it tolerable that the remaining one should be allowed to depend upon his industrious neighbours to find or make work for him at his own door?

We have most of us relinquished the luxury of employment at home amid the associations of our childhood. That is the blessing or the curse of the eldest son. The cadet must pack off, to get his living elsewhere; and the cadet who wields the spade must not expect more indulgence than the cadet who wields the sword or the pen. Everybody is recognizing the fact that the ice of our ancient institution is breaking up. The useless, injurious, old framework of settlement must be removed. Portions of it have already been carried off, and we are only anxious to see the remainder follow.

It will be desirable for all boards of guardians to petition for the abolition of compulsory removals; and if the way is not clear to an entire repeal of the law of settlement, for an enlargement of the area of settlement from the parish to the union, and for the equalization of the rates of the whole union by a gradual process.

Such a change in the area of settlement would have a tendency to put an end to that jealousy—natural enough as regards the pocket, unnatural as regards every other consideration—which urges landowners and rate-payers to drive the labourer to reside beyond the bounds of their parish even while they employ him. I say that a change such as this would tend to reduce bickering. It would, however, only remove the conflict from two parishes to two unions; and it

might be that the greater importance of the union would give a greater relative importance to a question about a pauper's settlement. It would be of the nature of a compromise, a part being accepted when the whole could not be obtained. While it would perhaps prevent the removal of one in eleven, it would render more efficient the machinery for the removal of the ten-elevenths remaining, an efficiency that would but give an extended and permanent character to the mischief. So far as it went, the probable operation would be beneficial; but an entire change, that would not only prescribe this advantage to the labourer expressed in union settlement, but throw open to him not only his union, but the whole country, would be such a sensible amendment as we can hardly expect.

A law that has always been found to act adversely to parish interests—that has impeded the labourer, restraining his liberty and prosperity, and yet tendering no equivalent—a law that has encumbered production, by the pauperism it has created and made stagnant—a law that has prevented the cultivation of our waste lands and demoralized our populous districts—a law that has fed the jealousies between parishes, and given rise to the greatest mass of dispute and litigation ever known in any nation during an equal period of time, its assumed object being to remove occasions of dispute, should not, one would think, possess any great claim upon our admiration or our gratitude.

If nothing beyond union settlement can be granted, union settlement must be thankfully received—but received only as a guarantee for that absolute liberty to migrate, which must come. What benefit to the labourer of Wiltshire would be the privilege to transport himself from one part of his union to another? Labour must not be held where not profitably employed. Nothing less than freedom over the whole land can adjust the balance of the wants and supply of industry. Nothing, save national freedom, can confer upon the labourer that reward of industry which he merits, and which we desire to secure for him.

Let guardians look this matter well in the face, then. Committees have sat upon the question, and blue books enough have appeared about it: all, or nearly all, concurring strongly in the advice to repeal absolutely, but gradually, the *Law of Settlement and Removal*. Parliament as yet has not moved responsively to these demands. "No voice is heard," it says, "and the amendment cannot be needed. We have other 'fish to fry,' and can let this abuse lie till there is a louder demand for its remedy." A petition from each union will suffice. Be up and doing!

ALPACAS IN AUSTRALIA.—Few enterprises of modern times have been marked with more determined energy or greater perseverance under unexampled difficulties than that which Mr. Ledger has at length happily accomplished. To the English public generally the name of this gentleman is but little known; but, unless we are greatly mistaken, the manufacturers of this country will at no distant date owe him a debt of deep and lasting gratitude, while his name will be remembered in the Australian colonies as one who had contri-

buted more to the permanent wealth of the country than any other individual. Mr. Charles Ledger is an English merchant, established for many years in Tacua, in Peru, the trade in alpaca wool forming a portion of his business; and about six years since he commenced carrying into effect the long-cherished idea of introducing into Australia this valuable breed of wool-bearing animals. The difficulties with which he had to contend in carrying out this idea were of the most remarkable character; but after six years of indomitable perseverance, and after undergoing an amount of danger and difficulty to which it has been the lot of few travellers to be subjected, he has succeeded in his object, and the last Australian mail announces the pleasing intelligence of the arrival at Sydney of 280 of these valuable animals. The flock includes sheep of the llama, alpaca, and vicuña breeds, together with some varieties that have been obtained by cross-breeding. The animals were, on the departure of the mail, quietly grazing near the city, apparently well contented with the change of climate and scene which they have experienced. The safe arrival at Sydney of the flock of alpacas is a great triumph to Mr. Ledger, and gives an example of intrepidity and prudence which deserves a public acknowledgment. To collect a flock in defiance of a Government—to divide it, like Jacob of old, for its better security—to conduct it over mountainous regions, exposed to all the vicissitudes of climate, change of feed, the ravages of beasts, and the jealousy and vindictiveness of men, then to embark that flock and convey it over the most distant seas, and finally to conduct it to a new world—to do all this combines a number of feats which, in a more poetic age, would have been the theme of song as well as of history.—*Australian and New Zealand Gazette.*

TRIMMING AND SHAPING WITH SHEARS SHEEP TO IMITATE THE BAKEWELL MODEL, FORM, OR CAST.

SIR,—In the *Mark Lane* of 13th Dec. last, it was justly and duly stated as follows upon the London Cattle Show: "Why do exhibitors persist in clipping, so as to present a straight flat back to the eye, and rumps, flanks, plaits, and bosoms apparently full and expanded, when the hand instantly detects the falsity of the outward show, and reveals the abominable attempt to thus gloss over a defective form? A sheep unfairly shorn and a pig unduly old ought alike to be disqualified by the authorities."

To back the above statement, for several years I have heard similar remarks and complaints by the spectators in the said London show-yard about trimming and squaring of sheep. Two years back I heard a fine old English Lincolnshire gentleman ask the owner of a pen of short-wooled cut-out sheep how it was that wool should grow so overmuch longer everywhere than it does upon the backs and loins of your sheep. "In my opinion," said the keen, well-informed grey-headed gentleman, "the prize ought to have been given to the trimmer and not to the owner of the sheep." The breeders of the short-wools are paying the breeders of the Leicesters a fine compliment by cutting their sheep into the Bakewell cast or frame; nay, and after Mr. Bakewell's death, 63 years, which plainly shows that Mr. B. lived nearly a century before his day. "We, the breeders of the Lincolns," said the gentleman, "have ever since the days of Mr. B. been aiming to breed our sheep in his cast, with a Lincolnshire coat of wool on their backs; wool and mutton combined, we consider the Lincolns second to none for profit. We shear our sheep close to the skin, and once a year, so that we have no sham hips, rumps, fore-flanks, and bosoms; of course, no wool to be found upon them two years old to make up for mutton where it is wanted." The *Mark Lane Express* being at all times ready and willing to correct and reform all grievances practised in agriculture, I hope it will reform the squaring of sheep. The great luminary of agriculture, Mr. Bakewell, of Dishley, died 1st October, 1795—too soon for his country's good.

SAMUEL ARNSBY.

Millfield, Peterborough.

SHEEP-FEEDING FOR MANURE.

SIR,—I observed in the *Farmer's Magazine* for this month a paper on sheep-feeding by Mr. Charles W. Hamilton, and although readily agreeing as to the value of the important information contained in it, yet think it right to point out a mistake of great practical importance, and which I am sure no one more than the writer will be glad to see rectified. Mr. Hamilton compares the analysis of two samples of urine voided by a wether and ewe of the same age, and fed on a given amount of oil-cake per diem. He states, "The analysis of the urine was as follows: 'Urine of the ewe sp. grav. 1.009 when acidulated with muriatic acid, and evaporated to dryness, the residuum weighed 2.609 per cent. of the weight of the urine, which when burnt with soda lime was found to yield 0.542 per cent. of ammonia. Urine of wether sp. grav. 1.057, heated in the same way, gave a much larger residuum, consisting of 25.43 per cent. of urine; and this when burnt with soda lime gave 9.165 per cent. of ammonia. The comparison gives—

Urine of ewe, sp. grav. . .	1.009	Ammonia	0.542
Urine of wether, sp. grav. . .	1.057	Ammonia	9.165."

He further states: "We then arrive at this conclusion—that the urine of the wether yields very nearly seventeen times as much ammonia as that of the ewe, and that using the ammonia as a measure the value of the urine of the wether is to that of the best Peruvian guano in the ratio of 9 to 17." Now, this must be most remarkable urine; although containing 74.6 of water, it is more than half the value of the best Peruvian guano, and of nearly twice the value for manuring purposes as the oil-cake on which the animal was fed. Where could this large amount of nitrogen be derived? If, however, we look a little closer into the subject, the reason of this apparently startling fact is at once clear, since it is very evident that Mr. Hamilton has taken the per centage of ammonia in the solid matter of the urine of the wether, and has considered it to be the per centage of the whole bulk. Reducing, therefore, 9.165, the per centage of ammonia in the solid matter to the per centage in the whole bulk of the urine, we obtain a result of 2.323. Instead, therefore, of the urine of the wether containing seventeen times as much ammonia as that of the ewe, it contains merely rather more than four times as much, and instead of standing to Peruvian guano in the ratio of 9 to 17, it stands in the ratio of 2.3 to 17.

We find, moreover, that these numbers correspond to a certain extent with the next experiment brought forward by Mr. Hamilton. The urine of a wether fed on oil-cake and oats was analyzed, and contained per lb. avoirdupois 252.80 grs. of ammonia, which reduced to per centage, equals 3.27 per centage, which is certainly much nearer 2.323 than 9.165 per centage, as stated in the former experiment.

Mr. Hamilton seems also to have lost sight of the fact that one of the chief reasons that artificial feeding is rendered profitable, is that the value of the dry material existing in the animal is much greater than as contained in the oil-cake; 1 lb. of mutton costing 8d., whilst 1 lb. of oil-cake costs rather more 1d. It would by no means pay to apply oil-cake as a manure for the land at its present price, since for the same amount of cash more than double the amount of ammonia could be applied as existing in guano than in cake.

These remarks do not interfere with the question at issue between Mr. Hamilton and Mr. Toite; nor do they but to a very small extent detract from the value of Mr. Hamilton's remarks, to whom is due the credit of being the first to publish any detailed experiments on the subject. Yours truly,

Elting, Feb. 15, 1859.

W. SPOONER, Jun.

ON COW SHEDS AND CALF PENS.

The climate of Great Britain most naturally induces a system of husbandry that yields a mixed produce of grains and animals, for the use of which articles the land is cropped in alternation, or in yielding grains with plants for the support of animals in a rotation of crops. The situations are not many which afford grains wholly without the use of animals; if not bred on the ground, cattle are purchased to reduce the straws into manure. The breeding of cattle forms a chief part of the agriculture of Britain, for the purpose of being reared and fattened into beef, or to be sold at the age of three or four years to be transported to other countries to be grazed and fattened with turnips. In either way the attention is the same that is required to produce the raw material of the finished article.

The condition of the young animal lays foundation of the future growth, and with the management of the same constitutes the chief requirement in the breeding of cattle. Neglect or attention at that period of the age of cattle spoils or makes the future quality.

A cow that produces a young offspring and yields milk is a heavy animal, incapable of enduring travel or fatigue, and demands much repose. The journeys must be short from the shed to the pasture ground, which must be rich and abundant in grass, in order to incur little trouble to the animal in filling its belly with a large quantity of food. The secretion of milk requires ease in every function of the body, and it must be indulged in every possible way. The best arrangement directs that a pasture field of convenient size be allotted to the use of the cows, in extent proportionate to the farm and the number it can support. If not rich by nature, this pasture-ground must be made very fertile by laying down with choice grass seeds, after fallowing of the land, with ample dunging and liming. An original state of indifferent grass may be much improved by earthy composts in top-dressings, and sowing of grass seeds, harrowing and rolling the surface. Draining must be done on wet lands, and shelter is essential in high situations, procured by erecting a roomy shed with a low roof, and turned from the boisterous aspect of the locality. The corners of the field being planted and covered with tall trees afford a very agreeable shade during heats and rains, and a clump of trees in the centre of the pasture ground adds to the convenience in that respect: the trees being rubbing posts to the necks of the animals, prevent the placing of posts for that purpose, which are necessary where no trees grow in the pasture field. A constant and ample supply of fresh water is essentially necessary, and is best contained in iron troughs that are placed in convenient use, and supplied by means of ball-cocks with water conveyed in pipes from springs on higher grounds, or from the provision of the farmery which adjoins.

The most approved arrangement of farm buildings directs an open front of the square form, to look to the quarter of the heavens ranging from east to south west, which presents two gable ends on the extremity of the east and west wings of the farmery. Either of these ends—most eligibly the western—may form the cowshed, that is entered by a door in the end, to which the gate into the pasture field is immediately contiguous. This proximity affords ease to the animals in a short travel from the rest to the search of food. The shed is ten feet high in the side walks, and twenty feet in width, affording eight feet for the length of the animal standing, five feet behind, and four feet for a walk in front of the meat troughs. The ani-

mals stand in trevices of eight feet in width, in which two cows are tied to stakes placed on each side of the division. This allows four feet to each animal, which is generally sufficient. The floor is pitched with stones, with an inclination, to discharge all moisture to the cavity of the posterior walk. The ventilation is effected by iron gratings at the bottom of the side walls, and by slit boards at the top of the roof, which can be opened and shut at pleasure. This provision is most necessary in all cases of heavy and abundant respiration as proceeds from such a large quantity of food undergoing the ruminant process in the paunch of milch cows. It is one chief provision of the cow-shed.

The front door of the cow-shed opens into a yard of the farmery, from which the winter cattle are removed, from May till October, leaving the use of it during the summer to the milch cows. In this yard are provided a shelter shed, racks for food, and a fresh and ample supply of water; and in it a number of the cows are accommodated with a most comfortable lodging, and have a supply over night of vetches and clovers in the winter and spring kinds, and in the first and second crops of the latter plant. This consumption of green food, accompanied with an ample supply of straw for litter, will yield much manure, relieves the cow-shed of a contaminated breathing, and lodges the animals very comfortably both in the shed and the yard. This supply of green food to milch cows is required, to encourage the quantity of milk, maintain the animals in good condition, and to increase the quantity of dung. The voracious maw of milch cows is seldom satiated, and requires a constant abundance.

Calf-pens form the next house to the cow-shed in the wing of the farmery, and for the convenience of being suckled. The arrangement directs a centre walk of four feet, having on each side of it the pens of seven feet in length, and four feet in width, containing one calf, with divisions of board, and a floor thickly pierced with auger holes, which discharge all moisture into a vacuum of one foot underneath, made for that purpose, and for a freshness of air. This separation of the animals prevents any disturbance by sucking and goring, and affords an easy access to the animal when wanted. Where veal suckling is practised, or where the weaning calves suck the dam, the animal is led by halter from the pen to the cow-shed, and when fully satisfied the calf is returned to its apartment. Where milk is given by hand, a slip-board in the door of the pen allows the head of the calf to pass into the pail outside, drink the milk, and withdraw, when the board is slipped into a close position. In both ways the animal enjoys a perfect stillness. A rack is placed on the top of the partitions, and in it are placed tender vetches and clovers, which the animal learns to eat, and also to lick chalk, rocksalt, and bruised cake, that are placed in a box in a corner of the pen. These provisions employ the animal, and lead into future use, and a great benefit.

A door opens from the house of calf-pens into a yard of the farmery, as with the cow-shed, and in this yard, after the first of May, the older calves are lodged, with the provision of ample littering, vetches and clovers in racks, fresh water in troughs, and a shelter shed. The animals are led to be suckled once a day, or oftener as may be approved, and again returned into the yard, as in the pens. When removed by age beyond the use of milk, a lot of calves can be weaned in this yard in winter; but it is best used in weaning the animals gradually

from the milk, and introducing the use of vegetable food, to become fit for the pasture field. The use is very great in this way; the calf in the pens is treated with the most tender green food, is accustomed to it in the yard, and finally subsists upon it in the fields. A sudden change is avoided, which is always hurtful.

An orchard furnishes a most agreeable retreat for weaning calves that are only allowed a portion of milk. The shade of the trees is very agreeable during heats, and a shelter from rains, with a shed for extreme cases; the grass is tender and delicate for the young condition, and is quickly learned to be eaten, and a supply of water completes the accommodation. According as convenience directs, the cows can be brought into the orchard to give suck at the fixed time, or the calves may be driven into the farm-yard. The cow may be most conveniently brought inside the orchard gate: when fed by pail, an opening in the nearest fence will permit the head of the calf to drink the milk, and exclude it by being shut. The position of the grounds will direct the respective applications, which should be made fit by the farmer, being arranged to comply with the requirements of use.

Milk cows require an abundance of food and of fresh water, little disturbance, ease, shelter, and repose; travel is to be avoided, and any harassing occurrences. Calves being reared must have an ample supply of food to forward a regularly progressive condition, and to produce a fattening from youth upwards. Of the ultimate perfection the foundation is laid in the first year, and very especially in the change from

milk to vegetable food. The latter must be early and gradually introduced into the calf pens, the most tender and delicate kinds being selected for the purpose, and the milk withdrawn as the age increases and advances the use of the green meat. The use of a yard with the pens allows the green food to be largely used, and a separation of the calves into older and younger divisions, which further permits the assortment of the food to be consumed. The juxtaposition of similar purposes of use very much facilitates the performance, and no labour is incurred beyond the bare necessity of the act. Distant positions create much unnecessary labour, and a traffic of annoyance to other purposes. The pasture field adjoining the cow-shed, the travel is short between the accommodations: the calf-pens opening into the cow-shed, the access is short and convenient; and a door from each house opening into a yard, affords a retreat for the cows and calves, the warmest that can be obtained. The green food is brought into the yard and placed in sacks, and an end door of the gable of the shed opens into the feeders' walk, and permits any food being given to the cows. In this way the cow-shed and pens, with the two yards, form a separate and independent employment, without giving or receiving annoyance in any other department of business. The arrangement is simple, and incurs no extra cost, and answers one chief object of the cultivation of land, if not the foundation of the whole business—butchers' meat proceeds from it, and manure, without which vegetable food could not be grown, or its production maintained. Hence the twofold value of the animal economy.

J. D.

ON THE MANAGEMENT OF BREEDING EWES.

KINGSCOTE AGRICULTURAL ASSOCIATION.

The Kingscote Association, formed a little more than twelve months since, is supported by Sir M. F. F. Berkeley, R. S. Holford, Esq., M.P., T. H. S. S. Estcourt, Esq., M.P., J. Rolt, Esq., M.P., Col. Kingscote, Col. Nigel Kingscote, C.B., M.P., and many other leading gentlemen, as also by most of the agriculturists of the neighbourhood. It has for its object the promotion of improved agricultural practice among its members by monthly discussonal meetings; as well as the encouragement of skill, industry, self-improvement, and good conduct among their servants and labourers by rewards from its funds. The meeting for the present month was held at Hunter's Hall (the usual place of meeting), on Tuesday evening, the 18th January, Mr. F. Burnett (the President) in the chair. Mr. Drew, the honorary Secretary, then read the following paper On the management of breeding ewes:—

“There is scarcely a branch of our business more deserving our attention than the one I am about to lay before you for consideration and discussion this evening, viz., the management of breeding ewes; the success and well-being of the whole flock depending in a great measure on the proper treatment of the ewe portion. It is also a subject in which all classes of the community are concerned and interested; as, of all our domesticated animals, none are more serviceable to man, their flesh yielding a most wholesome and nutritious food; their fleece, too, forms a very important and extensive article of commerce, supplying our artizans with a commodity which, when manufactured, is not to be equalled for service and comfort in clothing man's frail body. Again, what an amount of legal evidence is recorded

on their skins! every part, in fact, I may say, is converted to some useful purpose. But to the agriculturist they are an indispensable requisite; and particularly so to those farming light arable soils, no other animal making so good a return for the quantity and quality of food consumed, whilst at the same time they are the means of consolidating the land by kneading it with their feet, with that efficiency that no mechanical means yet devised can accomplish. This, and their enriching manure, constitute the foundation of improved and remunerative farming. In offering my remarks on their management, I fear I shall be able to put before you little what most of you are already acquainted with. I trust, however, by calling your attention to the different heads of treatment, according to the season of the year, each individual may be led to state his opinion and practical experience on the same to such an extent that will fully make up my deficiency. The acquiring and maintaining a flock of ewes in good and uniform condition and character requires a vast amount of judgment and perseverance, combined with care and attention; judgment in selecting that breed or description which will give the greatest return, taking into consideration the soil and situation where they are to be kept, also in choosing male animals that will rectify and improve the imperfections of the ewes; care and attention are also necessary in drawing the ewes to that ram which appears most calculated to correct their faults, persevering in this course till they become of one uniform character; that is, not resting satisfied before you obtain them as near alike as possible as regards symmetry, description of wool, and general appearance, it being well known that an

even-matching lot of ewes is highly appreciated, and commands a better price in a market than motley or mongrel-looking ones. The ewe should have a straight and broad back, wide loins, deep breast, good neck (or serag, as termed by some), the head rather long, but not broad, an open cheerful countenance crowned with a tuft of wool, which not only adds to its beauty, but is in a measure a preventive of sore head, and last, not least, a robust hardy constitution. I will commence with or at about the time of weaning the lambs—a period that must be partially regulated by circumstances, as how you are provided with proper and suitable food to keep them in a healthy and thriving state, as also if there is any tendency to scour; if so, the sooner in reason they are removed from their dams the better, a change of the system which is most effectually accomplished by a change of food—being the likeliest means of checking it. In an ordinary way I believe the first or second week in June to be as good a time as any; this will allow of having the ewe washed and shorn. A few days should then intervene for them to get accustomed to the loss of their coats, or at any rate the weaning of the lambs should take place at as great a time as possible from the shearing of the ewes, either as long before or as long after; for if they take cold at this time, it is more than probable it will fly to the udder, producing inflammation, which often turns to mortification, and generally ends in the death of the ewe. I prefer deferring the weaning till after the shearing, as it cannot well take place soon enough for the milk to subside to any great degree; consequently the udder would be very susceptible of injury, and which may occur in washing or shearing. I do think (unless especial care is taken in driving to the place of washing, and allowing them to get cool before commencing) this to be the most dangerous operation of the two. Again: if the lambs are allowed to remain a few days after shearing, they take cold; the lamb's sucking would in some measure be a means of preventing its spreading to that extent it otherwise would. On removing the ewes they should be put into a bare pasture, and at a distance, where the bleatings cannot be heard by either; otherwise both will be much excited, taking a longer time to settle and content themselves. After a day or two the udders should be carefully attended to, and those that are full and hard—causing a stiffness in the ewes' walking—should be occasionally milked. As soon as they have forgotten their lambs, and the milk is reabsorbed, I believe it a good plan to dip them in a solution of arsenic, soft soap, pearl-ash, and black brimstone, to free them from the irritation and annoyance of insects. Those not intended to be kept on for stock should now be drafted off and placed in better keep; in addition to which a small quantity—say three-quarters of a pound—of linseed-cake each daily may be given, I do believe, with profit and advantage. The time of putting the ram to them varies in different localities: for this neighbourhood the first week in October for long-wool ewes I believe to be a very good time. Downa may be put a fortnight earlier. They should now, and for three or four weeks previously, be kept tolerably well, for the purpose of bringing them quick to the ram; and the better condition they are in, the greater number of twins they are likely to produce. The usual custom is to turn the ram at large with from fifty to sixty ewes, which I repeat again should be carefully selected to that ram most calculated to rectify the several defects they may possess; every facility should be afforded, by trimming the ewes' tails, and the shepherd be particular to see that he does his work; it is best, however, to smear his breast with redde or some other colouring substance, and which may be changed at stated intervals: it serves as a guide in drawing them for the lambing pen, as

well as being a more ready detection in case the ram should fail in doing his duty, not being always to be relied on, even when apparently performing his work satisfactorily. Many of us know too well that such sometimes is the case. I have myself had sheep of different ages cease to get lambs, even after doing their work well for one and two years. This mode of proceeding by some breeders is not approved of, believing that from the high condition rams are often in, and the heat of the weather, they become careless of their work, allowing many of the ewes when coming up fast to go by. The plan they recommend is to keep the rams in small paddocks, placing a stag with the ewes to ascertain when they are in season, then bringing them to be served by such ram as may be considered best suited for the ewe. When served, they are taken to a field, and in the course of a week or ten days a different teaser is placed with them, to show if any should return (it must be borne in mind this would require the constant superintendence of the shepherd, and almost day and night). It is alleged, however, the extra trouble will be amply repaid, by the greater certainty of their being in-lamb, and that a sheep will serve 80 thus treated as easily as one allowed to run at large will 60; or that three will do the work of four for the first three months. After conception it is not necessary to keep them particularly well; but at the end of that time I do think it requisite to pay particular attention to their diet, as I am of opinion that this is as critical a time as any of their gestations; and I attribute many of losses, and some of our want of success—such as the ewes casting their lambs, shedding their coats, weakness after lambing, and a short supply of milk, the lamba dropping water-bellied, rickety, weak in their limbs, and otherwise dull and mopish—to some neglect, or not supplying them with proper and nourishing food at this time. My reason for arriving at these conclusions is that in seasons when roots have been plentiful and hay scarce, consequently my ewes been supplied plentifully with the former, and sparingly of the latter, invariably I have had greater casualties, both as regards ewes and lambs, than when the reverse has been the case, or when they have had plenty of hay, and turnips sparingly. I also think that should there be a great quantity of rain about this time (or I should say from now to the time of lambing), so as to make the ground wet and tender in feeding off turnips, it would be better to remove them for a few days to a field of old seeds or dry pasture, having known great losses occur; and I have sustained such myself, by allowing them to remain on turnip-land when very wet and dirty; consequently if running on pasture, whenever the weather is unpropitious they should have dry food of some kind. If on turnips, give them moderately; at the same time, plentifully supplying them with hay. When within three weeks or a month of lambing, they should be bountifully supplied with the most nutritious and invigorating food procurable, for the purpose of giving strength and vigour to the system, and creating a sufficiency of good and wholesome food for the offspring. This brings me to the time of lambing, which usually occurs about 21 weeks after conception; but often, I have observed, rather longer with a ram than with a ewe lamb. The lambing-pen I prefer having in an open, dry, airy place, taking care to well shelter it from the north and east winds; having always experienced less losses when so situate than when for the sake of warmth a low, close, damp place has been chosen. Shelter from the cold and wet being necessary for a short time after lambing, temporary huts, made with hurdles and straw, should be provided on each side of the pen, or at least on the east, west, and north; so that advantage may be taken when the wind or rain comes from these quarters. The ewes, when they come into the pen,

should have every care and attention paid them, and be used as quiet and gentle as possible. No stranger, or any dog, ought to precipitately enter their abode. After yeaning they should be placed in the huts, prepared as before stated, for a day or two, that they the more easily be under the control of the shepherd, and the ewe in some degree recover herself, and the ram gather a little strength. From the huts they should for another day or two be turned into a well-sheltered fold, prepared for their reception, with a shed to run to in case of foul weather; or, if the pen will allow, a part may be appropriated for the purpose, as sometimes, if turned out too soon, and the wind be very cold, death from swelling and mortification will probably take place. When milk is required for suckling, it is much better to keep back a ewe for a day or two, that has an abundance, than it is to administer cow's milk, as they seldom do with it, particularly weak ones; or a ewe that has brought a dead lamb may be reserved for a few days: if a shepherd well understands his business, he need never be at a loss when to supply a lamb with a meal of milk. I once had a shepherd that lambed his ewes two years following in this way. He would insist cow's milk did more harm than good: and I do say I never had one so successful in rearing lambs. When an unnatural presentation takes place, or a ewe in any way requires assistance, great care as well as experience is necessary to be observed; too much haste oftentimes proving fatal both to ewe and lamb. On the other hand, it is not well to delay help too long; the ewe, by so much heaving and straining, gets tired and worn out, and becomes so weak as not to be able to bear up under the severe operation. In all difficult cases, I at once administer a dose of medicine—either 3 oz. of salts or 3 drachms of aloes, with a little ginger. This assists the bowels, and tends to allay the fever which invariably accompanies these cases; then, in the course of four or five hours, a scruple of opium, as a means of easing the pains, and preventing them from heaving or straining; keeping up the system by giving gruel sweetened with treacle, and a small quantity of port-wine added, or what I think equally as nourishing, a pint or pint and a half of linseed mucilage, given three times a day. They should now have plenty of roots hauled to them about the seeds or grass-fields, with as much good hay as they will eat, but, if it can be avoided, not again placing them on the turnips, the lambs seldom doing at all well when confined on them. Those having twins should, in addition, have a few oats or a little linseed-cake, as I believe it would be the means of creating a good quantity and quality of milk, and that the subsequent thriving of the lambs depends in a great measure on a good start. As the season advances, and their natural keep (grass) begins to be their chief food, they are commonly turned adrift, to do the best they can for themselves. They should, however, be kept as few together, and changed as often, as circumstances will admit. The last few years, by another method—that of hurdling off the seeds, giving a fresh tie or fold daily—it is affirmed the sheep do much better, and the keep goes much further. How far this is correct or otherwise, I should not like to take upon me to say, as I have only tried it one season; but, if my experience on that occasion is worth anything, my opinion would be the reverse of its advocates'. Most of the diseases our sheep are subject to being little understood even by much more experienced persons than myself, I must not attempt to describe them. We know that, if in good condition, in nine cases out of ten, the surest and best remedy is the knife. I will close my remarks with a few words on the treatment of our Chilver tegs, which, if not

directly, is indirectly connected with the subject before us—that is, as the spring advances, and they begin to change their teeth, the roots should by all means be cut for them, as, if allowed to gnaw them, as is the too common practice, they will scarcely eat enough to keep them in growing condition. The expense of cutting will not exceed 1d. per head per week. This saving in hay will quite compensate for the extra quantity of roots consumed; and I am certain that, when turned to grass, they would be from 2s. to 3s., if not 3s. to 4s., per head better for the outlay, and, consequently, more likely to grow into good ewes.

Mr. THOMAS said: Mr. Drew had entered so fully into the details of the subject, that little remained to be said. He quite agreed with Mr. Drew, as to the desirability of shearing the ewes previously to weaning the lambs, believing the sucking of the lambs a great means of preventing inflammation of the udder should the ewe take cold from washing or shearing. He was in the habit of having his ewes dipped once and his lambs twice in the course of the season; he thought it highly advantageous to do so. He liked to be in a position to allow them a fair quantity of roots, with plenty of hay for at least a month before lambing, but did not approve of confining them on turnips after lambing, as he had always found them to do better placed on pasture, and supplying them there with swedes and mangold wurzel.

Mr. BURT in a great measure agreed with what had fallen from Mr. Drew; but as regards hurdling off the seeds in summer, he had tried it several seasons, and certainly thought it a more economical plan than allowing them to roam at large, the keep going further; the lambs also, from being allowed to precede the ewes did well; he must, however, admit, that as the keep became old, they did not feed it down quite so close as he could wish.

Mr. BLACKWELL was of opinion that a liberal supply of turnips did not hurt at any time, provided they had plenty of hay along with them; he had also known ewes and lambs do well on young turnips in dry weather; he thought turnips (if young) much better for producing milk than awedes.

Colonel KINGSOTE felt greatly interested in the discussion going on. He wished to know if it was advisable for lambs after being taken from their mothers to have access to water or not? as he had often observed the drinking place where lambs were running fenced off, and he could not help thinking that in very dry warm weather water was necessary.

Mr. DREW in reply to Colonel Kingscote's enquiry said: It was the opinion of many that water had a tendency to make them scour: for himself, he thought that if they always had had access to water no injury would arise from the practice; but if for a time kept from it, it then became imperative to continue to do so. Until the last four years he was not in the habit of allowing them water; the last year, however, of not allowing it, the shepherd removing the hurdles one day in very warm weather for some cattle to drink, neglected to replace them; consequently the lambs got to the pool and drank considerably; they afterwards commenced scouring, which we could not stop, and 27 of them died in about six weeks. Since that time I have never kept them from water, and have not sustained any loss.

Mr. G. BARBER thought it very desirable to remove the ewes from the lambing fold as soon after yeaving as could with safety be done, placing them about in small lots in warm well-sheltered spots to gather strength. He was of opinion the ewes and lambs would do on turnips for a short time, care being taken to provide shelter; and in case of rain straw should be shaken about for the lambs to lie on. Curdling of the milk

in the stomach is a complaint young lambs are very liable to, and often proves fatal. The best and surest remedy he had ever applied was a tea-spoonful of carbonate of soda, dissolved in a little water, and given immediately it is mixed.

Mr. LONG believed the subject under consideration to be a very important one: he in the main agreed with the previous speakers: no doubt the descriptions, quantity and quality of food had a good deal to do with the well-doing of the flock. He believed, however, a good shepherd to be a matter of great requisite, a little neglect on his part sometimes proving very disastrous. He had never before heard the remedy named by Mr. Barber for curdling of the milk in lambs. He hoped he should find it efficacious, as it was a general complaint,

and if it was a means of cure, it should be made generally known.

Mr. Ford, Mr. Tanner, Mr. Price, with other members also took part in the discussion.

The CHAIRMAN said he had listened with considerable attention to the proceedings of the evening. He certainly was very much gratified by the manner in which the subject had been brought forward and entered into: so much had been said, and the time almost at hand for closing the discussion, he thought it would be well to pass a resolution; which was accordingly done. It approved of the management as prescribed by Mr. Drew.

A vote of thanks to Mr. Drew closed the proceedings.

REPORT OF PLOUGHING EXPERIMENTS.

By JOHN LENNIE, Lauder Barns, Lauder.

[Premium—The Gold Medal.]

With the view of testing the draught and examining the work of ploughs of different construction, working at various depths, and thereafter ascertaining the result as to produce of crop for comparison, several ploughs were collected on this farm, on the 19th day of February, 1856, under the auspices of Sir Anthony Maitland and the Lauderdale Agricultural Society, the acting committee of which were present.

The field upon which the trials were conducted is situated in the northern part of Berwickshire, about twenty miles inland, and has an altitude of 540 feet. The ridges ploughed lie due north and south, and have nearly a uniform fall to the north of 1 foot in 16. The soil is clayey loam, 8 inches deep, resting upon a retentive red sandy clay subsoil, traversed with veins of moorband. In 1847 it was in summer-fallow, when it was thoroughly drained, subsoil-ploughed, limed, and sown with wheat and grass seeds for two years' depasturing. It has since been farmed on the fifth rotation, and was, when ploughed, in two years' old lea, and in medium fertility.

The following observations have reference to ten of the ploughs which were brought forward. Three of these—viz., Howard's prize wheel-plough, the Carrington Currie plough, and the common or Small's plough—were each drawn by two horses. The Marquess of Tweeddale's Yester plough, and Small's plough fitted with a large mould-board for deep work, were drawn by three horses abreast, with compensation-lever awing-trees. The five remaining teams were an exact duplicate of the above, and all of them were placed on ridges contiguous to one another in the order tabulated. Three ridges were allotted to each of the four ploughs with three horses, and a couple of ridges to each of the two-horse ploughs. The ploughmen had no further instructions before commencing work, than that they were to plough as they did respectively at home. The dynamometer employed was Slight's, and the observations given are the average of several taken down. This also applies to the depth and width of furrow-slice.

It will be observed from table No. 1. that the two Yester ploughs, although the heaviest drawn, give the greatest sectional area of soil turned over for the power employed, as well as for each horse used. Howard's wheel-plough comes next, notwithstanding its great weight when empty, as much power being required to overcome its own weight as is spent in the turning over of a substantial furrow-slice in a soil of more than medium tenacity as that given. It was the first of the two-horse ploughs, was remarkably steady in its motion, and showed less oscillation on the index of dynamometer than with any of the other ploughs when tested. Small's plough at all

the depths showed favourably, and the Currie least so of any. When the horses were pushed to their utmost walking pace, for the purpose of testing the influence of the velocity of the plough upon its draught, the dynamometer showed no variation either in ascending or descending the slope from the power given: it is therefore not tabulated. It is, however, of great importance, as it shows the necessity of procuring horses which naturally walk with a quick step, as they can overtake more work in a given time, with the same effort, than sluggish heavy-limbed animals. Although there is little variation in the draught of the plough in ascending the hill from that in its descent, yet the exertion of the horses is in ascending greatly increased from the mere carriage of their own weight; and this farther shows the value of active animals, of good muscular energy, as they do not require to spend the same amount of effort as heavy ones.

The frequent delays caused by affixing the dynamometer to the implements, and noting the observations, prevented the time taken to plough each allotment being kept with any degree of accuracy. All the work was, however, done about the same time, and at the usual rate, less the stoppages. The additional breadth turned over by the three-horse ploughs more than compensates for the third horse, besides the extra depth attained. The twelve horses attached to four ploughs turned over 11 poles 8½ yards more surface than the twelve attached to the six ploughs, besides two men's work being saved.

On the 12th day of March the whole of the allotments were sown by the broadcast sowing-machine with 4½ bushels of Sandwich oats per acre. The ridges worked by the three-horse ploughs got a single tine of the harrows to close the interstices of the furrows before sowing, yet leaving sufficient mould to cover the seed.

All the portions braided well and regularly. The braid on the ridges of the two-horse plough was rowed along the furrows, especially that on the ridges of Howard's and the Currie ploughs; while on the ridges of the three-horse ones the braid was scattered and irregular, and as the season advanced became blanky—the Yester plough most so. Howard's at this time looked to be early, and the best of the whole, and continued to look so until cut. About the beginning of July the Currie promised to be the earliest, but was comparatively thin and short on the ground. The whole was reaped by the sickle on the 17th day of September, although the Yester portion would have required two days longer to have been equally ripe as the others.

The oats were cut on the 17th September, and put up in

stooks of six alveas on each ridge, every alternate stook being afterwards led off the ridge on the east side of each allotment, and weighed on the cart unthrashed. The weight of the oats when thrashed being deducted from the gross, gives the weight of straw, chaff, and loss, as stated. The results are given in table No. II.

Howard's prize wheel-plough gives the greatest amount of produce both in grain and straw, taking its combined plots, as given in table No. III. The work was exceedingly well executed, especially that of No. 4, the man having a premium awarded him. The work of No. 9 was nicely cut, but not so well closed as it should have been. This plough, from its light draught, and being easily held, promises to come into extensive use. It is so constructed that it can be adjusted to any kind of work in the field by the ploughman with facility. The furrow-slice is rectangular, the sole of which is cut flatter, and is cleaner taken up, than that of any other plough the reporter has seen working. Although the mould-board is fully a half longer than that of Small's or the Currie plough, yet the pressure being only on the lower edge of the furrow-slice, and not against its whole side, as with them, its draught is greatly lessened. Small's three-horse plough is next, taking also its two combined plots, and gives the highest produce of oats in No. 6. Small's two-horse plough, giving a rectangular furrow, follows, and maintains its long-established character as a good implement. The ploughing performed by both teams was well and uniformly done. The Currie plough, giving a high-crested furrow-slice, is furthest behind in point of produce of any of the two-horse ploughs, although its work on both of its allotments was well executed, that of No. 3 being awarded a premium as the best ploughing on the ground. This plough seems to be getting rapidly into disuse. Although its work is very uniform and pleasing to the eye, its false cut with the heel, left at the bottom of the furrow, is a great objection, as it increases the work of subsequent tillage, while the frequent narrow furrows lengthen the operation of ploughing, and increase its cost; and the difficulty of keeping the irons in proper working trim obliges the ploughman to visit the smithy too often.

The high-crested furrow sometimes shows an advantage over the rectangular one, when the land is in good condition, and sown immediately after ploughing. The frequent narrow furrows with high apex facilitate the action of the harrows, and give an equally-covered seed bed and uniform braird, while the other shows best when time intervenes between ploughing and sowing, so that the action of the weather may put the more substantial furrow-slice into a mellow and friable state before sowing. On the other hand, when the high-crested furrow is subjected to the action of rains and frosts, the high point of the furrow is worn and washed away, sufficient mould being wanting to cover in the seed properly.

The reporter has repeatedly tested for comparison the produce from a high-crested and that from a rectangular furrow. In the field reported upon in the year 1846, forty-five ploughs competed at a match in two classes—ploughs turning a rectangular furrow-slice, and those giving a high-crested one; the best of either class to be awarded the Highland Society's medal, along with the first money-premium of its class. This was adjudged to a Carrington Currie plough's work, with a beautifully-executed high-crested furrow. On the crop being carefully tested, for the purpose of reporting to the Agricultural Society, it was found that the premium portion gave the least produce of nine plots tested, five of which were rectangular and four high-crested.

As to ploughing matches generally, the reporter is of opinion

that they are too much directed to the execution of fine work upon lea ground, and that an object would be obtained if agricultural societies would follow the example of the local society here, which has resolved to divert its premiums from the ploughing of lea to the ploughing of land after the turnip crop. This is expected to have beneficial results, as in such cases the ground is invariably sown down with grass seeds for two years' depasturing; and it will be more satisfactory for the Society to promote the better execution of work which is to form the basis of three crops—than for that which is to produce only one, as in lea; while the hurried and careless manner with which land after green crop is frequently worked, with the consequent eyesore of flanked ridges in pasture-land, may thus be lessened.

The Yester plough is farther behind in point of produce than any of the others: it, however, exposes to the action of the air the greatest surface of soil in a loose and broken state, and gives sufficient soil to fill up interstices before sowing, with enough of mould remaining to cover the seed. When we take into account that the common three-horse plough is second in point of produce, the result upon the whole may be deemed satisfactory as far as regards deep ploughing. The Yester plough probably went too far into the subsoil in one operation, as the land upon which the trial took place had not been at any time worked other than in the ordinary way, with the exception of the subsoiling in 1847. The test of produce after deep ploughing, where part of the till is worked upon, cannot be held as conclusive, continued operations being required to bring out its full effects, and care being taken not to mix too much of the bottom soil with the top at one time, but to do so gradually year by year, giving a fresh portion of it to be acted upon by the atmosphere, and rendered soluble. On the home-farm of the Earl of Lauderdale this has been practised with uniform success for the last five or six years, throughout the whole course of the rotation: and I have no doubt but that system of culture, as introduced by the Marquess of Tweeddale at Yester, will be adopted more generally than it has yet been. It may be said that it is more easy and economical to work 6 or 7 inches of the soil, and retain it in well-manured condition, than 9 or 10 inches. But as the working of the larger body of soil costs less than the smaller, as shown before, besides the additional depth attained, lessening the expense of subsequent tillage, may it not also carry a heavier crop?—will it not be more ready to take full advantage of the organic natural aids to vegetation, and thus be kept at less cost in a state of fertility than the smaller body of soil?—and will not the air permeate the large, loose, and broken furrow more thoroughly, and thus eliminate from it a greater amount of inorganic ingredients than the shallow body of soil? One thing is certain, that its resting on a deeper and drier bed maintains its temperature, keeps it in tilth, and allows it to be worked earlier, with less use of harrows and rollers, while its longer continued capillary attraction supplies moisture to vegetation at a period when that would be wanting. The deficiency of the shallow high-crested furrow strengthens this idea. A distinguished English agriculturist lately said, that "he contended that aëration was as necessary to the roots of a plant as to its leaves."

To carry out deep tillage in all its integrity, it must go hand in hand with thorough drainage and the stirring of the subsoil, which latter essential can be best effected, and at least expense, with Reid's wheel subsoil-plough. It is lighter in draught, steadier to work, and easier held than the Deanston subsoil-plough, which the reporter used for some time before trying Reid's with an improved coulter and tail-board. With this he has subsoiled upwards of a hundred acres, with every

satisfaction. A good plan of overtaking work with it is to subsoil only every alternate furrow; this enables the wheels of the soiler to work better, from the furrow being clearer of

clods than it is when every furrow is done at one time. Next rotation it should be again gone over with the subsoiler, taking care to cross that which was previously done.

No. I.—TABULAR STATEMENT OF DRAUGHT WITH SOIL-TURNER AND POWER EMPLOYED.

No. of Plough.	Name of Plough.	Horses employed.	Weight of Plough.	Dimensions of Furrow-slice.	Transverse Sectional Area of Soil turned over.	Draught descending Incline.	Draught ascending Incline.	Average Draught.	Soil turned over to every 1 1/4 lb. of Power employed.	Soil turned over to each Horse employed.
		No.	Imp. Stones.	Inches.	Inches.	Stones.	Stones.	Stones.	Inches.	Inches.
1	Small's plough	3	12	8 1/2 x 11 1/2	97 9-12	48	50	49	2	32 1/2
2	Yester plough	3	16	10 x 12 1/2	120	56	60	58	2 1-12	40
3	Currie plough	2	8	5 1/4 x 9	49 1/2	25	27	26	1 11-12	24 1/2
4	Howard's plough	2	14	6 1/2 x 10	65	26	30	28	2 4-12	32
5	Small's plough	2	8	6 1/2 x 9 1/2	59 5-12	30	32	31	1 11-12	29
6	Small's plough	3	12	9 1/2 x 12	114	50	54	52	2 2-12	38
7	Yester plough	3	16	10 x 13	130	54	58	56	2 4-12	43 1/2
8	Currie plough	2	8	6 x 9 1/2	57	32	34	33	1 9-12	28 1/2
9	Howard's plough	2	14	6 1/2 x 10	65	26	30	28	2 4-12	32
10	Small's plough	2	8	6 1/2 x 10	65	34	34	34	1 11-12	32 1/2

No. II.—TABULAR STATEMENT OF PRODUCE.

No.	Name of Plough.	No. of Horses employed.	Square Yards in Allotment.	Sheaves in Allotment.	No. of Sheaves weighed.	Weight of Sheaves.	Produce of Oats in Sheaves weighed.	Produce of Straw, Chaff, and Loss in Sheaves weighed.	Sheaves per Imperial Acre.	Straw, Chaff, and Loss per Acre.	Oats per Acre.	Total weight per Acre.	Oats in Bushels of 42 lb. each per acre.
						Lbs.	Lbs.	Lbs.	Sheaves.	Lbs.	Lbs.	Lbs.	Bushels.
1	Small's	3	4000	612	107	1122	376	746	740	5159	2600	7759	61 33-42
2	Yester	3	4016	582	103	1100	367	733	701	4933	2497	7435	59 19-42
3	Currie	2	2614	396	96	990	332	653	733	5024	2534	7558	60 14-42
4	Howard's	2	2550	390	86	1034	332	702	740	6040	2856	8896	63
5	Small's	2	2570	422	103	1034	340	694	794	5102	2499	7601	59 21-42
6	Small's	3	4176	622	90	1056	364	692	720	5536	2912	8448	69 21-42
7	Yester	3	4240	606	93	990	355	655	691	4714	2411	7125	57 17-42
8	Currie	2	2755	430	108	1122	359	763	755	5334	2509	7743	59 31-42
9	Howard's	2	2710	426	102	1210	362	848	760	6318	2697	9915	64 9-42
10	Small's	2	2730	466	120	1254	393	861	826	5926	2705	8631	64 17-42

No. III.—TABULAR STATEMENT OF PRODUCE ON ALLOTMENTS COMBINED.

No.	Name of Plough and Furrow cut.	Square Yards in the 2 Plots.	Per 2 acres : Straw, Chaff, and Loss, in 2 Allotments.	Per 2 Acres ; Oats in 2 Plots.	Per 2 Acres ; Total Oats and Straw, &c., &c.	Oats in Bushels of 42 lbs. each per 2 acres.
		Yards.	Lbs.	Lbs.	Lbs.	Bushels.
1 & 6	Small's ploughs, deep	8176	10,695	5512	16,207	131 17-42
2 & 7	Yester ploughs, deep	8254	9,702	4908	14,610	116 36-42
3 & 8	Currie ploughs, high-crested furrow	53.9	10,358	5143	15,301	120 3-42
4 & 9	Howard's ploughs, rectangular furrow	5260	12,358	5553	17,911	132 9-42
5 & 10	Small's ploughs, rectangular furrow	5300	11,028	5204	16,232	123 38-42

A FARMER'S LIFE AND DUTIES.

On the recent presentation of the Testimonial to Mr. John Clarke at Long Sutton, that gentleman gave the following sketch of his career.

The outlines of a life like mine cannot be very interesting, or possess any remarkable features worth your notice; for I was born where I now live: "I till the land my forefathers tilled." Still it may not be inappropriate to this occasion, and may tend to encourage some of my young friends present to prosecute a course of industrious usefulness—I say, to encourage my young friends; for bear in mind, we do not all possess the same natural powers, either mentally or physically; we can, however, by industry and care improve both; we can strengthen our minds by reading and study and mental effort, just as we can add vigour and hardihood to our bodies by athletic exercise and manual labour. Now, I verily believe that few young men have commenced their career under more disadvantageous circumstances than myself, as respects mental acquirements and effort. I frankly and freely tell you it was in this way I became impressed with the foolish idea that my family was well to do; if not rich I should do very well in the world, and therefore might enjoy myself. A more fatal idea to prevent mental effort could not take possession of the mind; consequently field sports, cricket, and the like, had full predominance; and so I went on from year to year. I, however, attended to farm duties daily, and for twelve years worked hard on my father's farms and our own, as a constant ploughman; and for twelve harvests I stacked a large proportion of the corn, and in the various labours of the farm took my part; this I don't at all regret. I never heard a man complain that he worked too hard, or attended too much to his business in his young days; recollect that, in the main, nothing but persevering industry can achieve success; superior talent is of great value, but careful persevering plodding industry will beat the finest talents in most cases. Well, young, inexperienced, and self-sufficient as I was, I recollect at the age of seventeen or eighteen I came to this resolution (for I felt it was incumbent upon me to adopt and persevere in some definite course)—*i. e.* That I would endeavour 1st to make myself a good member of society, 2ndly a good parishioner, and 3rdly a good and useful man of business. There cannot be a doubt that resolutions of this sort made in youth, and conscientiously acted upon, would be of vast benefit to the community. We have all our several duties to fulfil, both in public and private. The world, and particularly that minute portion of it with which we are immediately connected, should be the better for our living in it; otherwise we nearly live in vain, or live wholly for ourselves. Well, to become a good member of society (a vast deal is included in being a good member of society), I set about making myself useful; I became a teacher in our church Sunday-school, and was superintendent of

another for many years. I took great interest in music, and in promoting good congregational singing. I managed a large Friendly Society (this I have done for upwards of forty years). As time rolled on, I became greatly interested in other matters. The days of ploughing matches and prize stacks were scarcely known: the only way we had of encouraging either the one and the other was by frequent inspections; and though some evil arose from these inspections, it served to promote the very object I and some of my young friends had in view. The evil was this: It was the invariable custom for the ploughmen around Long Sutton to do their best on the Saturday to leave their primest work, so that passers-by on the Sunday might view it. This soon led to a good deal of Sabbath-breaking; and groups of young men might be seen every Sunday taking their stroll round the district or through the marshes to see the straight furrows or the best attacks; and I regret to say, finishing their walk at "The Wash;" and more particularly on tidal Sundays, when many disgraceful scenes were enacted. Long Sutton Fair was at this time merely a servants' holiday; and it was no uncommon thing for young men of more strength than wit to try their prowess in boxing, and many such matches came off in my early days; so many that it became a matter of serious thought as to, what should be done to put an end to this disgraceful course; for it was notorious that if a young man was known to be a fighter, he had to defend himself from more than one challenger at these meetings; indeed, the test of championship seemed to be put off to this very meeting, and I recollect, as a ploughboy, hearing of the arrangements got up for the atchievement. Well, things could not go on so. A meeting was got up at Sutton, called a drawing-match—that is, the ploughman who could draw the straightest furrow or make the best ridge received a copper teakettle, or some equally homely but useful prize. I thought this far better than boxing-matches and the like; and at once did my best to encourage it, in which I was aided by several friends. This was our first effort in ploughing matches. We kept it up for some years with very good effect. It drew off from Sutton many refractory spirits; the zest for drinking and boxing was allayed; and as the parties were thus divided, the worst features of Long Sutton Fair subsided. It is now a quiet, orderly meeting—in fact, a pattern of a convivial, pleasant assemblage of servants for mutual recognition and congratulation—a meeting of a very useful kind, as serving to keep up great nationality of character and feeling—a holiday which no one grudges, but that all desire consistently, in reason and in moderation, to enjoy. The Long Sutton Market was soon after this time established, and the fair assumed a higher character. A better order of things prevailed; a decided elevation in the character of our population was to be noticed, owing, I believe, to the many public meetings held—such as bible, missionary, tract meetings, and others, aided by extended and efficient religious teaching in the pulpit and Sunday-schools. Gentlemen, it was by giving my best aid in all these movements that I endeavoured to become a good member of society.

But I resolved to fit myself for becoming a good parishioner—that is, I resolved to see wherein I could be useful to my parish, either to aid as I best could in the management of

parochial business, or in correcting any of the abuses or irregularities that had, or may, in the course of time, have arisen. When I commenced business, now over forty years ago, the poor were managed by assistant or deputy overseers, who received each a handsome salary (for at the time I speak of we had two). The parish doctor received from £100 to £110; bailey-constables, at handsome salaries—£35 each. At this time the poor had nearly the mastery over the overseers; for it was only requisite for the pauper to go to a magistrate and make oath that he was destitute, and at once to receive a peremptory order for relief, and it was at the peril of the overseer to refuse it. The rates were consequently very high for relief; but added to this it was customary to pay the *rents* of a great many paupers' cottages, so that the poor's-rate became an enormous burthen (6s. to 7s. in the pound). A few of us set about its reduction, and many unhappy dissensions we had. We speedily got rid of the assistant-overseers, most of the cottage rents, and by establishing a system of labour either on the roads or otherwise, materially reduced the relief list, and consequently the rates, as I believe with real contentment to the poor. A great many gross inequalities had crept into the rate-book, and I have now in my possession the book which I made out under direction of our committee, which so forcibly showed the absurdity of some of the ratings, that we soon had these rectified. Then there was the making the rate (highway-rate); that is, a chosen or customary party went to the vestry, an adjournment was soon moved to the Bull Inn, a capital dinner and wine, was provided, the rate was made, and the dinner bill paid out of it. The charities came next to be considered. These were in a most unsatisfactory state. The lands were let to the friends and relatives of the trustees at low rents. The trustees were very few in number, and in some charities nearly extinct. The church rates also engaged our serious attention: they were very heavy, and included mole catching, sparrow catching, besides all footways and bridges, &c. The steeple was always under repair, and I believe much money was fictitiously expended upon it. The rates had been collected for eight years without being accounted for. What would our church-rate abolitionists say to this? Well, we set about reforming all these matters, and we gradually effected them, and in a way that works satisfactorily up to this time.—I often wonder what our zealous young reformers would have done in those days! those were real reforms in parochial affairs! now, I reckon them only gleaners in the reform field. All this was not done without some odium and unkindness. It was thus that I sought to make myself useful as a parishioner.

I have one more point. I resolved to qualify myself to become a useful man of business, both in public and private. Well, this I found to be the most difficult thing to attain to; and which I have not, nor ever shall attain. However, there was nothing like setting about it. I recollect very well borrowing of Mr. Thomas Peele a number of Evans and Ruffy's Farmers' Journal, the agricultural newspaper of forty years back. I was greatly interested in reading about Holkham sheep-shearings and Woburn gatherings, ploughing meetings and the like. I soon began to take unusual pleasure in such matters at home; and although we had no matches to test the skill and powers of our workmen, yet the best of them were pretty well known in the district—such as Carter's Will, Forster's Billy Percival, Mr. Peele's George Barton. As time passed on, the whole country became aroused by the success which attended the Holkham and Woburn meetings, and the Holkham system of agriculture. Agricultural societies began to spring up here and there, and were soon on the increase everywhere, and it was not likely that the

inhabitants of this district, who have always stood prominent in promoting every improvement likely to benefit their country, would long be without a society of their own. In the meantime I paid great attention to the introduction into this district of new varieties of grain, seeds, turnips, mangolds, cabbages, kohlrabi, chicory, carrots, lucerne, and sainfoin; and after a time the whole country was aroused to enquiry, and now you hear of new "sorts" every where, and every body getting them. I also endeavoured to promote improvements in culture, such as autumn culture, subsoil ploughing, hollow-draining: on the latter subject permit me to state that I wrote and published the first pamphlet ever printed at Long Sutton (this was by Mr. Swain). I also undertook to keep up a breed of large framed and heavy-woolled sheep for the use of the neighbourhood. It was in this way that I sought in my small capacity to be a useful man of business. I now come to the business of this to me very interesting day, and wherein I have been enabled to act more in a public capacity. I have said that Long Sutton will never be behind-hand in promoting improvements; consequently the establishment of an Agricultural Society was often talked over, and at length a fitting time came, and it is one of the many good things which have emanated from this annual meeting for the benefit of the neighbourhood. It was at a meeting of this association held on January 23rd, 1837 (twenty-two years next Monday), that the Long Sutton Agricultural Society was mooted. The following Friday, February 3rd, was fixed for holding the meeting for establishing the society and drawing up the rules, and by adjournment to the 17th, when they were finally carried, and the society established upon its present basis. The operations, however, for the first year were restricted to the parishes of Long Sutton, Sutton, St. James, St. Edmund's, and Gedney, but in the following year it was extended to its present boundary. W. Skelton, Esq., was appointed treasurer, and myself secretary. The premium list comprised prizes for stock, and rewards for labourers; and this order was maintained with varied success up to the meeting of 1844, when the prizes for stock were discontinued. In the course of the first year an amalgamation was attempted with a similar society formed at Holbeach, which failed. In 1839 we numbered 130 members. In 1841 Mr. Skelton was elected president of the society, and myself treasurer as well as secretary. In 1843, the first prizes were offered for mowing wheat, which speedily had the effect of putting down all prejudices against that course. In 1844, the first prizes were offered for hollow-draining. In 1847, the first prizes were offered for allotments. In 1854, the All-England, or Champion ploughing class was established, and the first educational prizes were given. In 1857, the steam-plough was introduced, the potato-digger, and a large collection of implements was exhibited. In 1858, steam-ploughing and steam-cultivation in several of its best phases, a clever locomotive steam-engine, and an economical reaping machine were shown; indeed it has been my aim as your officer to introduce to your notice specimens of our most useful implements, or such as were obtaining the greatest popularity, in order that they might be seen, and, if approved, adopted. I have now gone through with this review, which is chiefly about myself. I ask you to forgive this egotism: you must pardon this setting forth of my doings; it is meant in some sense as an answer to your distinguished token of approval. You have this day honoured me above and before all others in this district: this splendid testimonial is the first given here to any individual for services of this character, by the general public. I shall not stop to point out the great benefit this society has conferred upon the locality: these beautiful and valuable tokens are a sufficient testimony that

you think it a valuable society, and that you approve of my efforts in helping to conduct it. I wish they had been more worthy your approval. What I have done has been from a strong sense of public duty. I am a true believer in the prize system: to it we owe the improvement in British agriculture. I believe that we have mainly to look for our prosperity as

farmers—to agricultural improvements, in the judicious adoption of the best breeds of stock, the best modes of culture, the best varieties of grain and of roots, the best implements, the best manures, and the best and most economical management of the whole. It is in this way we may—and I would add, that we will—defy the whole world to beat us.

THE SELLING OF GRAIN BY MEASURE OR BY WEIGHT.

There is no subject to which the attention of governments, in most countries that have made any progress in civilization, has been more frequently directed than that of weights and measures; and there is none the legislation about which has given less satisfaction. How are we to account for this? Before any legislation was attempted on the subject, there was as great a variety of weights and measures as there were petty principalities, of which the present kingdoms are made up: the inhabitants of each petty state were as wedded to their own weights and measures, as if upon their existence depended their own liberty. The certain effect of any compulsory measure under such circumstances would, we believe, have been rebellion and revolution; and the real consequence of a permissive measure has been, as we see every day around us, an interminable confusion—a perfect Babel of weights and measures. But other circumstances have tended to produce dissatisfaction. Often those who ventured to legislate on the subject were little practically acquainted with it, and did not consult practical men as wisely as they ought to have done; and hence inadvertencies were made, which, though slight in themselves, became most serious when, on being attempted to be carried into practice, they were found at every hour and transaction to be grating on the convenience of the public. In former times the necessity of legislation on this subject was little experienced from the want of communication between different parts of the country, by means of trade and otherwise; hence the annoyances now felt at such a variety of weights and measures were scarcely experienced then; and hence also the difficulty found in substituting the imperial for the local measures and weights; they both became jumbled together, and new standards were actually made out of the mixture. Now, however, the country appears to be ripe for legislation again, if we may judge from the meetings which are constantly being held, and from the deputations which are being appointed by different mercantile communities to represent their case to Government. In the sale of corn, more than in anything else, there is great room for improvement in weights and measures. The present method of transacting business by means of the imperial quarter is found to be cumbersome, and liable to lead to disputes, and is, in fact, in every way unfitted for affording those facilities so necessary in great mercantile transactions.

We are not going to trace the history of the different standards that were used for the sale of grain from the earliest periods up to the present day. We will refer the reader for this information to the discussion which took place at the monthly meeting of the Highland Society in March 1837, and which was reported in all the agricultural periodicals of the time. We will begin with the year 1824, in which a great attempt was made by the Legislature to “ascertain and establish uniformity of weights and measures,” by passing an Act.

Previous to the passing of this Act, every county had its own standards of weight and measure by which the grain was sold; and the Act passing into law did little to remedy this evil, though its avowed object was to produce uniformity. We quote from the paper of Mr. M'Lagan, read at the meeting of the Highland Society referred to above: “There were several defects in the Act:—1. None but scientific men were examined by the commissioners previous to the framing of the Act. The advice of practical men, or men engaged in trade, would certainly have been of use in the composing of any measure on the uniformity of weights and measures. 2. Two pounds were retained—the troy and the avoirdupois. 3. Heaped measure was also retained. 4. Existing weights and measures were allowed to be used, provided they were marked so as to show the proportion they bore to the standard weights and measures. The effect of this measure was the introduction into Scotland of new weights and measures which were never contemplated by the Act.” The weak point in this Act was what is noted as the fourth defect above. It prevented being done all that the Act contemplated to do. It is clause 16th, and enacts “That it shall and may be lawful for any person or persons to buy and sell goods and merchandise by any weights or measures established either by local custom or founded on special agreement: Provided always that in order that the ratio or proportion which all such measures and weights shall bear to the standard weights and measures established by this Act shall be and become a matter of common notoriety; the ratio or proportion which all such customary measures and weights shall bear to the said standard weights and measures shall be painted or marked upon all such customary weights and measures respectively.” The framers of the Act must have been shortsighted indeed if they ever expected to abolish all old and local weights and measures, and introduce uniformity with such a permissive clause in the Act. The consequence was what was foreseen by all capable of judging in the matter; the confusion became greater than ever, and the Legislature was obliged to interfere again. Accordingly, in 1835 an Act was passed, repealing the said clause of the Act of 1824 in the following words:—“So much of the said recited Acts as allow the use of weights and measures not in conformity with the imperial standard weights and measures established by the said Acts, or allow goods and merchandise to be bought or sold by any weights or measures established by local custom or founded on special agreement, shall be and the same are hereby repealed.” Again: “All local or customary measures shall be abolished; and every person who shall sell by any denomination of measure other than one of the imperial measures, or some multiple, or some aliquot part, &c., shall, on conviction, be liable to a penalty not exceeding the sum of forty shillings for every such sale.” Again: “Every person who shall use any weight or measure other than those authorised by this Act, or some aliquot part

thereof, or herein-before described, or which has not been so stamped as aforesaid, &c., shall, on conviction, forfeit a sum not exceeding five pounds; and any contract, bargain, or sale made by any such weights or measures shall be wholly null and void."

We have thought it proper to quote these clauses from the Acts to show the real position of the question, as many, not being aware of the Act of 1835, have the impression that to produce uniformity in the sale of grain we should have another Act passed enforcing by penalty the sale of grain by the imperial quarter. It will be seen from the quotations that the Act of 1835 is stringent enough; and all that is wanted now is that the authorities carry out the provisions of the Act. We may as well, however, mention here, that though the Act of 1835 appears plain enough, there is a discrepancy in its interpretation between the English and Scotch judges. In England there have been decisions which appear to favour the opinion that local measures may still be used in transactions; thus it was found legal to sell wheat by the *hobbett*, a Welsh measure. In Scotland, on the other hand, the reading of the Act has been literally interpreted, and any bargain made by any local weight or measure has been held to be null and void; as, for instance, the selling of crop by the *Scotch acre*, or the measuring of drains by the *Scotch chain*, or more recently the selling of potatoes by the *boll*, even though in making the bargain the boll should be mentioned to be of 4 or 5 cwt., or any other weight. This latter case was decided by Sheriff Barclay, of Perth, the grounds of whose decision are most ably given, and are well worthy of a perusal. In so far as Scotland, therefore, is concerned, there is no doubt of the meaning of the Act, and all that would be necessary to produce a uniformity of decisions in England and Scotland would be a short declaratory Act.

Such, then, is the law regarding the selling of grain and other farm produce; but what is the practice? Let everyone answer this question for himself by turning to the reports of the sales of grain, &c., in the different market-towns of England, Scotland, and Ireland, where he will scarcely find any two of them alike, and where he will be puzzled at finding the names of many local weights and measures of which he never heard before. And if he has been studying these reports for some years, he will have observed in them the gradual substitution of weight for measure in many places, in defiance of the threatened penalties of the Acts of 1824 and 1835 against all who sell grain otherwise than by the imperial quarter. Year after year the law is becoming more and more honoured in the breach than in the observance—legal enactments are yielding to public convenience. Surely the law must have been framed on wrong principles, and its requirements must be felt as irksome and inconvenient, when such a decided and wide-spreading violation of it is being perpetrated in such a peaceable manner.

What are the objections of people to the statutory provision of selling grain by measure? The principal objection is, that it leads to disputes in transactions. Any one at all practically acquainted with the subject must admit this. There cannot be a more uncertain method of ascertaining the quantity of grain than by measure. Even in measuring liquids, due precautions must be taken to arrive at correct results, by attending to the force of attraction between the liquid and sides of the vessel. And if such difficulty is found in obtaining accuracy with an incompressible body as a liquid, how much greater must it be to get correct results in measuring such an article as grain, in which the pickles can be packed so closely to one

another as to make a material increase in the quantity contained in the measure! Hence the quantity or weight of the grain in the measure will vary according to any circumstance which has a tendency to compress its bulk. Thus the greater the height from which the grain is poured into the measure, the greater will be its weight; any motion causing a vibration in the floor during the operation of filling the measure will also cause the same bulk of grain to weigh more, by shaking the pickles closer to one another; the force with which the roller is placed on the measure before the grain is rolled, will also cause a variation in the weight. In short, so liable is this method of selling grain to error from the trifling causes mentioned above, that seldom will the same man obtain the same result with scientific accuracy, when weighing the same grain; though we admit sufficient accuracy may be reached, with care, for all practical purposes. Need we be surprised, then, that differences in the weight per bushel, and in the quantities contained in any measure, so often occur, when the grain is weighed, first, say on the stone floor of a barn, directly from the fanners, and afterwards, under entirely different circumstances, on the wooden floor of the loft of the buyer. And need we be surprised at the disagreeable disputes which arise therefrom between buyer and seller? Hundreds of instances of this kind occur every week in the transactions between farmers and dealers, and between merchants in the same and in different towns. Let us take one: A farmer was in the habit of sending all his barley to a brewer, leaving the price to be fixed by him. Every lot sent in, when tested by the bushel measure of the brewer, weighed lighter than it did when measured on his farm; he sent his bushel measure to be tested by the Dean of Guild—it was found to be all right, and was stamped accordingly: but still the same disparity continued in the weight per bushel of his barley when tested by his and the brewer's bushel, though the latter was also duly stamped by the Dean of Guild. Again, a farmer sold barley to a party in Edinburgh twice, and both times the weight per bushel on the farm and in Edinburgh differed: the average difference was half-a-pound per bushel, for which 4s. 6d. was withheld by the buyer for over-weight on the whole lot, which was 16 quarters, and the buyer retained into the bargain the half-pound of barley per bushel which produced the over-weight, and which, for the 16 quarters, amounted to 64 pounds—equivalent in value to 4s. 6d., according to the rate at which the rest of the barley was sold. Thus, then, on these 16 quarters the farmer lost 9s., or more than 6d. per quarter, for giving what he thought was the just weight and measure of his barley: for the greatest attention was paid to the sacking of it. It may be asked, Why did he submit to the loss when he was so certain of being right? The barley was tested in the presence of his servants, and mixed with other lots before he was aware of the difference; and even though this had not been the case, his bushel measure was miles off, and there was the uncertainty of producing a result, under the different circumstances, the same as what he got at home, even though his own bushel measure were used. These are only two out of hundreds of cases that might be adduced, to show how those disagreeable disputes arise in grain transactions. Similar differences, only more aggravated by their magnitude, are as liable to occur in those large grain transactions which are daily taking place throughout the kingdom, while the course of trade is at the same time much impeded by the slow process of measuring instead of weighing grain.

Public opinion is divided as to the expediency of changing the method of selling by measure for that of selling by weight under present circumstances. We believe that all are agreed

that the latter method is far better adapted for the convenience of trade; but some object to any change, on account of the interference it will necessitate with private interests. We have, then, two parties—those who wish it legalised to sell by weight, and those who wish to adhere to the present system, the selling by measure. To the former class belong almost all the extensive merchants, millers, and dealers in corn throughout England, Scotland, and Ireland; to the latter belong principally a large proportion of those agriculturists who are accustomed to sell their grain in stock markets, such as Edinburgh, Dalkeith, &c.; while we have reason to know that in those districts where selling by sample is the practice, there is a pretty strong feeling among farmers in favour of selling by weight. And we may mention further, that farmers are gradually and tacitly giving in their adhesion to the selling of grain by weight, by their adoption of the practice of sacking their grain directly from the scales, without measuring any of it but the four first bushels. There is no doubt, then, that the great majority of those connected with the grain trade, whether they be producers or purchasers, are in favour of selling by weight; and there is as little doubt that, even under the present law, far more grain is sold by weight than by measure. We have, therefore, little hesitation in affirming that there is a great preponderance of opinion in favour of selling by weight.

Such being the case, it becomes those who are in favour of the present system to give due weight to the opinions of the other party. Let them not attempt to throw obstacles in the way of an amicable settlement of the question. Let them not try to enforce the present law by penalties without due consideration. The first penalty imposed will be the knell of the present system; it will raise a storm that will not be quelled but by the sacrifice of that system which they are so anxious to uphold, viz., the selling of grain by measure. A question such as this is not to be decided by the exaction of penalties, but by the rules of justice, and by what is found best for the convenience of the public and the purposes of trade. Let them not be misled as to the state of public feeling and the sentiments of Members of Parliament. The influential meeting held at Liverpool lately, which was attended by gentlemen connected with the corn trade, and representing various markets in the country, was no bad exponent of public feeling. The following was the resolution unanimously adopted:—“That this meeting do therefore recommend to the trade in Liverpool, and elsewhere throughout the kingdom, that from and after the first day of February next, the weight of 100 lbs. avoirdupois be adopted and used in all sales of grain, flour, and meal.” And this was passed, let it be remembered, in the face of an existing statute, which enjoins the selling of grain by measure, and which some gentlemen consider it the wisest plan to enforce by penalties. And what is the feeling in Parliament? The proceedings of the last session will answer this question. Mr. Bass introduced a short Act rendering the selling of grain by measure or by the imperial quarter compulsory, as in fact the present law does: it passed the first reading, but was thrown out at the second reading on the representation of one or two of the Chambers of Commerce throughout the country.

While we caution the one party against attempting to force upon the country a system which is found to be most inconvenient, we would urge upon the other not to be rash in resorting to legislation on such an important subject; for there are some strong reasons and serious objections against hastily substituting weight for measure in the sale of grain. At none of the meetings held to confer on this question have we seen the slightest allusion made to the manner in which grain is

sold in other countries, if we except only the great meeting at Liverpool, where it was stated by some gentlemen as a good reason for adopting 100 lb. as the standard weight for selling all kinds of grain, that that was the standard used in Canada. We have now a most extensive trade in corn with other countries; and it would be advisable, were any change made here, to communicate with the principal corn-exporting countries, so as to have one uniform standard over the world. We throw out this suggestion in the hope that it will be taken up by those who are moving in this matter. If there is the prospect of effecting this desirable object, viz., the obtaining a uniform standard over the world—say, 100 lb. or its equivalent—it would certainly be better to delay making any change for a time.*

It cannot be denied that a serious objection against the change from measure to weight is the interference with private interests and arrangements which it will cause. In England, measure is sanctioned in the Tithes Commutation Act. In Scotland, rents are agreed on by the imperial bushel; ministers' stipends are paid according to measure; and many other private agreements are made which would have to be re-adjusted were there a change in the law. It might be said that grain might be sold by weight, even though these arrangements were in existence and unaltered. It could only be done by those who are never called upon to give evidence of the price of grain sold throughout the year for striking the fairs prices; but farmers and others who are summoned to give evidence in the striking of the fairs, must continue to sell by measure till some adjustment be made between weight and measure in present agreements, and the fairs be struck according to weight, and not according to measure, as at present. Now many consider this an insuperable objection to making the change from measure to weight. It is, no doubt, at all times with great reluctance, and not without strong reasons, that the Legislature would sanction any measure which would disturb existing agreements between private individuals. But if this can be done with justice, and the consent of all parties, the objection vanishes. Now we do not consider the present method of striking the fairs prices (we allude to them particularly, for it is by them that all agreements in grain in Scotland are settled) such an insuperable objection. When the Act of 1824 was passed, it was provided that juries were to be sworn in every district and county where it was necessary to make the proper adjustments in private agreements between the old system and that introduced by the Act, which was the uniformity of weights and measures. And if it was done before, why cannot it be done again? We would have as much confidence in the verdict of such a jury as we have in the results obtained according to the present haphazard method of striking the fairs. There is no subject on which legislation is more called for than the fairs; and we are glad to find that the county gentlemen of Edinburgh, having called the attention of the Commissioners of Supply throughout Scotland to the irregularities and uncertainties of the present method, we are now on the eve of legislation on it. A more favourable opportunity then, could not be got for effecting the change from measure to weight, so as to conform to the plan now advocated of selling grain by a uniform standard of

* While this paper is passing through the press, we have heard that a meeting of merchants was held at Berlin about the 11th of last month, at which it was agreed to cast aside measure (except as a mark of showing quality), and to sell all grain by weight—wheat, rye, barley, and oilseeds, per 2,000 lbs.; oats per 1,200 lbs.; other corn and potatoes, per 100 lbs. In all changes that have been recently made in the standard of selling grain, 100 lbs., or a multiple of it, has been fixed upon as the most convenient, and in anticipation of the decimal system being adopted through time.

weight. We rejoice to think that the fiars prices are brought forward as an objection to the change from measure to weight in the selling of grain, as the whole subject will then be brought before the public, and its weak points exposed. We are as desirous of having an improvement in the method of striking the fiars prices, as we are of being allowed by the law to sell grain by weight.

It will be asked, How is it practicable to adjust present agreements if the change be effected of selling grain by weight instead of measure? We suggest with much diffidence a plan which has occurred to ourselves. Let a jury of proprietors, tenants, and others interested, be impanelled, and evidence be led before them of the weight of the grain per bushel or per quarter for a number of years; let the average of the several weights given in be struck. The average thus obtained will be held to be the average weight of grain grown in the county for which the evidence was led, and will be used for converting the measures of grain mentioned in particular agreements into the relative weights. Thus, supposing that the rent per acre of a farm in a particular county was 4 bushels of oats, 3 of barley, and 2 of wheat, and that the average weight per bushel for that county was found to be 42 lb. for oats, 55 for barley, and 62 lb. for wheat, then the converted rent would be 168 lb. of oats, 165 of barley, and 124 lb. of wheat; and as the fiars prices would be struck at so much per 100 lb., it would be easy to reduce these to their money value.

As it is always safe, at the commencement of any agitation for the change of a system, method, or practice, to bring the difficulties prominently forward tending to prevent such a change, so that each may be met on its own ground, we have been desirous of doing so at present. We will therefore mention as another objection to the change from selling by measure to selling by weight, the alteration that will be necessary in the Excise laws in the collection of the malt-tax. But if the Legislature consent to make the selling of grain by weight legal, all these difficulties would soon be swept away, as, in our opinion, they are not so great as at first sight they appear to be. But it is necessary that they should all be mentioned, so as to meet with due consideration before the great change is made.

The question of selling grain by weight is somewhat complicated by not a few insisting that it should be made law that the natural weight per bushel, or any other imperial measure, should always be mentioned in any sales of grain. It does appear strange to us that those who are anxious to abolish the selling by measure, should still insist upon retaining a measure in transactions in grain. If any such measure be used, the same liabilities to disputes will remain as are complained of at present. We have seen, in the cases adduced in this paper, that no two men will fill a bushel measure, with the same grain, so as to obtain the same weight. Why, then, go to the Legislature and demand that the selling by the quarter should be abolished, and at the same time ask that an aliquot part of it or itself be retained for use, so as to aid them in judging of the quality of the grain? There is surely great in-

consistency here. Though the weight per bushel of grain, or its specific gravity, is mentioned now in transactions, there is no law compelling the stating of it, but it has simply become the practice to do so, and that only within a few years; for the time is not long past when all grain was sold by measure, without any reference whatever to weight. We understand that it is not the intention of those who adhere to the resolutions passed at the Liverpool meeting to petition in favour of the bushel or any measure being retained to aid the parties buying and selling to judge of the quality of the grain. A good judge of grain does not require to know its specific gravity; he will tell the value of it by merely handling and seeing it. A knowledge of the natural weight per bushel weight, or, what is the same thing, the specific gravity, however, will be an aid to those who have not sufficient skill or experience; and if it is found necessary to continue the practice for such, it may be done without rendering it compulsory by law. There are many conditions often stated in making bargains, which are only binding on the parties immediately interested; and the specific gravity of grain may, with great propriety, form one of these conditions; indeed it would be an important element in bargain-making. We are not of the opinion of those who maintain that the weight per bushel of grain is the principal criterion of its value. We will agree with them so far, that it is only one of the standards of judging of the value. Dantzic wheat, for instance, weighing 62 or 63 lb. per bushel, will often bring 7s. or 8s. more per quarter than some of our Scotch wheats weighing 65 lb. per bushel. So also wheat grown in East Lothian will command a higher price than wheat grown in some of the higher districts of Mid-Lothian, though the latter will weigh more per bushel. The practice followed in Edinburgh market is reckoned a model; we take up, therefore, at random the report of that market of 8th December, and we find there that wheat weighing 63 $\frac{1}{2}$ lb. brought 41s. and 43s., and weighing 59 $\frac{1}{2}$ lb. brought 39s. and 43s. 6d.; so barley weighing 55 lb. brought 27s. and 32s. 6d.; and oats weighing 41 $\frac{1}{2}$ lb. brought 22s., while that weighing 41 $\frac{3}{4}$ lb. brought only 21s. 3d. But why should grain be made an exception to the ordinary practice of dealing in the other articles of consumption? There is surely as great difference in the specific gravity of the varieties of coffee as there is in that of grain; why then do we not insist upon knowing the specific gravity as well as the weight of coffee when we purchase? Why should the dealers in grain not be as good judges of the quality by looking at it and handling it, as the dealers in all other articles? If it be found just, wise, and expedient to sell these articles by weight, which vary as much in specific gravity as grain, why should we be enjoined by Act of Parliament to adopt a more uncertain method for the latter? We may be sure that the common sense of the country will not much longer tolerate such an anomaly, and that sooner or later we will have all the grain in the country sold by weight, which is the most natural, as it is the most correct and unvarying, standard of quantity.—Journal of Agriculture.

ON THE DIFFERENT KINDS OF PHOSPHATES OF LIME.

TRANSLATED FROM THE FRENCH.

The Academy has charged M. Boussingault and me with the examination of a note of M. Moride, containing observations, and the results of many experiments, on the phosphates of lime employed as manure, and particularly on those of the

compositions called *minerals*, masses of which, more or less considerable, are found buried in the soil.

It is not the first time that this important question has called for the investigations of science: a great work, now in

course of publication, of our illustrious permanent secretary, M. Elie de Beaumont, is at this moment drawing the attention of the public to the same subject.

There would indeed be an immense benefit to agriculture in obtaining phosphate of lime, assimilable by plants, to the same extent as phosphate of ground bones acidified, imperfectly carbonized, or mixed with organic azotous substances, such as are present in the refuse of sugar refineries.

Under these conditions phosphate of lime, by virtue of its interposition in the midst of organic tissue, presents itself in a state of extreme division easily assailable by acids.

In England its divisibility, as well as its dissolubility, are still further increased by treating the bones with sulphuric acid, which forms sulphate and bisulphate of lime, attacking even the organic tissue, so that the osseous fragments become soft and friable.

In presence of the carbonate limestone of the soil, or of that which is added to the bones thus disintegrated, the excess of acid is found saturated, the organic azotous matter becomes spontaneously changeable, and the ammoniacal products of its decomposition co-operate of themselves to the nutrition of plants.

Effects analogous to these take place when we employ carbonized bones in powder, mixed with the blood used in effecting the clarification of sugar or syrups; there are added to them reactions equally favourable, dependent on the porosity of that animal charcoal, capable of condensing the ambient gas, and of yielding them gradually afterwards to the absorbent organs of the vegetables.

It is not known to be entirely the same with mineral phosphates; endowed with a very strong cohesion, the mechanical means by which, even to this day, we are only able to treat them, are insufficient to reduce them to a state of division comparable to that of phosphate of bones.

Besides, have not the importations of mineral phosphates from Estramadura into Great Britain, produced amongst the agriculturists all the favourable results that are expected from them? One of us, M. Dumas, had the opportunity, in 1850, of stating this fact, during a mission with which he was charged by the Minister of Agriculture and Commerce, relative to the agricultural improvements introduced into England, Scotland, and Ireland;* it does not appear that they have since succeeded in obtaining in Great Britain as good effects from the mineral phosphates as from bones, or the black residues of the refineries.

On his part, M. Moride, who, with M. Bobierre, has rendered indisputable services to agriculture, by analyzing the manures deposited in the Government dockyards, and exposing certain frauds in commercial manures, has proved by direct experiments the insolubility of many mineral phosphates in the weak acids, in the state in which they are now offered to agriculturists;† and he has thought it his duty to caution these

last, by pointing out to them the means of detecting the mineral phosphates mixed, whether it be with organic matters or with the phosphate of bones, or with the bones black of the refineries. For this purpose he recommends particularly the employment of acetic acid in a boiling state, which attacks and dissolves these last, whilst it leaves the others intact, and the incineration of which yields, with the phosphate of bones or the black of the refineries, white ashes; whilst the mineral phosphates produce red or brown ashes.

We shall render to agriculture a still greater service if we discover the means of economically dividing the mineral phosphates to the state in which they readily become assimilable by plants.

M. Morin thinks that we shall attain it by dissolving these natural phosphates by powerful mineral acids, in order to separate them from the sand; then by precipitating the solution with ammoniacal and magnesium liquids, afterwards adding to it animal or fermentable matters.

This process, probably efficacious, would undoubtedly be too expensive; at least, it could not be executed in localities where they have not the opportunity of applying to it the dissipated vapours of chlorhydrate acid, and add to it afterwards either magnesium sea-water or ammoniacal water condensed in the refrigerators of oil gas, or hydrate of lime; and everything leads us to hope that we may succeed in reuniting economic conditions of this kind which admit of utilizing the natural phosphates.

Whatever may happen, M. Moride will have effected a useful object at this moment, on which we perhaps found, upon the incomplete preparation of mineral phosphates, great expectations, by calling the attention of agriculturists to facts which were little known to them.

We have, in consequence, the honour of proposing to you to address to this young scholar the thanks of the Academy, recommending him to follow up his useful investigations.*

PAYEN,

Member of the Academy of Sciences, and Permanent Secretary of the Central Society of Agriculture.

by ammoniac, and the phosphoric acid sought for in the calcined precipitates, by adding some drops of azotic acid, and taking up again by distilled water, in which they add azotate of silver. The following are the results obtained thus:—

Specimens.	Phosphate of Lime.	Phosphate dissolved by Acetic Acid.
Phosphate (pure or calcined) powder (bones)	99.20	0.254
Bone dust calcined white	92.00	0.288
Bone charcoal fit for refining ..	73.10	0.300
Black residue of refinery	63.40	0.340
Opatite of logrozan (Esiramura)	94.25	0.000
Nodules from the Ardennes	66.00	0.000
Do. in black dust of commerce ..	70.00	0.000
Do. of the Ardennes calcined ..	62.00	0.000

The opatite had left dissolved by the acid 26 millièmes of oxide of iron. The three following specimens had yielded 34, 26, and 28 millièmes of oxide of iron and alumina.

M. Morine has further stated that the phosphates of bones are soluble in seltzwater, surcote of lime, and in peat animalized by means of fermentation; whilst the natural phosphates which he has examined are insoluble in them.

* The recommendations of this Report are adopted.

* See the Reports on Drainage, the Retting of Flax, the Peat Mosses, the Bakeries, and the Commercial Manures, published by the Minister, and in the Memoirs of the Central Society of Agriculture in 1850.

† In order to demonstrate the solubility of certain pulverized phosphates, M. Moride has taken of each of them 0.05 gr., and treated them with 10 cubic centimetres of acetic acid during ten minutes at + 65 degrees. The filtered liquid was precipitated

HORSE-TAMING.

SIR,—Numerous articles on this subject in the papers have attracted my attention, embracing a variety of theories, in all of which the use of drugs is said to perform a prominent part. It is the conflicting and erroneous opinions advanced in these paragraphs that have induced me to adopt this method of laying before the public the principles of the theory practised, if not by Mr. Rarey, by his confrères, with equal success, in the states of Ohio, Illinois, and other parts of the Union.

This art is not of very recent discovery. In a work published about the year 1814, on the art of "Taming Wild Horses," is given Willis J. Powell's system, in which he describes the process, similar in many respects to the following: He repudiates the use of drugs, as being quite unnecessary, although he says, "I have made use of certain ingredients before persons, to disguise the real secret; and many believed that the docility to which the horse arrived in so short a time was owing to those ingredients: but you will see from this explanation that they were of no use whatever." His process was somewhat slower than that practised in the present day. He says that, by his secret, "a horse is tamed in from two to sixteen hours;" whereas, I have seen the same performed in less than one hour.

The fundamental principles of this theory are founded on the leading characteristics of the horse, which seldom receive that attention they justly deserve from horse-breakers and those who have the care and management of this noble animal.

The horse is so constituted that he will not offer resistance to a demand made of him, which he fully comprehends, if made in a way consistent with the laws of nature. Being totally unconscious of his strength, beyond his experience, but little force is required to subdue him, if properly applied. He will allow any object, however frightful it may appear, to be taken round him, over him, and on him, that does not inflict pain, after he has once examined it by smell, and more narrowly by the touch. This last characteristic has caused a diversity of opinion, and, united with the sense of smelling, has led to many remarkable delusions respecting the use of strong oils or drugs for the taming of wild horses. It is a prevailing opinion that the sense of smell is the governing sense of the horse. Hence comes the idea of drugs being esteemed indispensable in horse-taming, the fallacy of which may be easily proved: Can your readers, or any one else, give me one single reason how scent can convey any idea to the horse's mind of what we want him to do? If not, scents are of no use for taming the horse. Everything we get him to do, without force, must be accomplished by some means of conveying our ideas to his mind. I say to my horse, "Go on!" and he goes; "Wo!" and he stops. The meanings of those two terms have been taught him, by the tap of the whip and pull of the rein that first accompanied them. If he is thus taught to go on and to stop when told, to go to right or left as required by the voice, it is quite certain that much more might be taught him by using proper means to improve his intelligence. And how long do you suppose, reader, a horse would have to stand and smell of a bottle of oil, &c., before he would learn to bend his knee when told, to lift his foot, or lay down, &c.?

Thus you see the absurdity of trying to break a horse by means of drugs and articles to smell of, or medicine given him, of any kind whatever.

The only true method of breaking horses, and that which I shall briefly describe, is that which takes them in their native state, and improves their intelligence. Caresses, scratching in parts not easily reached by the animal himself, giving food or water after long abstinence has caused hunger or thirst, and the careful use of various tones of the voice, are useful in the tuition of the horse. A liking for the pupil, and tact in training it—which, if they be not natural, are almost as difficult to acquire perfectly, as to become a poet—are essential qualifications in the tamer of all animals, throughout their various grades of intellect.

I will now attempt briefly to describe the system of horse-taming I have seen successfully practised in the Western States of America, on animals of all kinds of dispositions; those taken wild from the prairies, where they have been subjected to no restraint, and the stubborn, vicious mule, have alike submitted to its influence in a manner almost incredible to the most sanguine.

Horses are of two kinds: the one is timid, and appears only to fear man; but the other class are of a stubborn or vicious disposition, and although they are not wild, and do not require taming in the sense it is generally understood, they take much more subduing. Great tact and skill are required in their management, before a complete reformation can be effected. I will first speak of that kind which only fear man; and to persons who understand the philosophy of horsemanship, these are the easiest trained. When we have a horse that is wild and lively, we can train him to our will in a very short time; for they are quick to learn, and always ready to obey.

Taking a jockey-whip in your hand, with the lash pointing backwards, enter the stable alone. It is very disadvantageous to have any one in the stable with you; you should be entirely alone, so that there is nothing but yourself to attract the attention of the pupil. When you have entered the stable, stand stationary with the whip held as directed, and the left arm, bent at the elbow, projecting forward. In this position, allow him to look at you a minute or two; and when his curiosity is somewhat satisfied, approach him slowly, with your arms in the position directed. Go neither too much toward his head or croop, so as not to make him move backward or forward, thus keeping the horse stationary. If he does stir, move also very cautiously to right or left, which will keep him in one place. As you get very near to him, move a little to his shoulders, and stop a few seconds. If you are in his reach, he will turn his head and smell your hand; not that he has any preference for your hand, but simply because it is projecting, and the nearest part of your body to the horse. This all colts will do; and they will smell your naked hand just as well as of anything you can put in it, and with as good an effect, however much some men may have preached the doctrine of giving them the scent of drugs from the hand. When the horse smells, you caress him very gently at first, merely touching him, so that your hand may pass along as smoothly as possible on the forehead; or the side of the head and neck will answer the same purpose, if more con-

venient. Favour every inclination of the horse to touch you with his nose, and always follow each touch or communication of this kind with caresses and gentle words. By repeating the same words in a kind, steady sort of voice, he will soon learn to know as well when fear, love, or anger prevails, as you know your own feelings, two of which, *fear* and *anger*, a good horseman *should never feel*. After you have succeeded in handling his ears, he may be very cautiously haltered, and the bridle then carefully put on. Proceed by stroking and caressing the head, neck, sides, and back of the horse to his tail, and then his legs and feet, until he will allow himself to be rubbed and handled all over, and his feet lifted without betraying any nervousness or anger.

All this operation is not magnetism, or galvanism; it is merely taking away the fear a horse generally has of man, and familiarizing the animal with his master. As the horse experiences a certain pleasure from this hauling, he will soon become gentle under it, and show a marked attachment for his person.

Some horse-tamers recommend that all horses should be thrown in the manner I shall presently describe, in order to obtain perfect obedience. They must be taught to fear love, and obey, the two first of which must be obtained before we can expect the latter; and it is by this philosophy of obtaining fear, love, and obedience that we may govern any horse whatever.

If the horse is of a stubborn and vicious disposition, and has not that regard or fear of man it is desirable he should have, if when you enter the stable he lays his ears or turns his heels to kick you, a few sharp cuts with the whip must be given, quick and with precision, about the legs, pretty close to the body, just sufficient to frighten him, and no more. If you wish in this way to frighten him, you must do it at once; but never go into a pitched battle with the horse, and whip him until he is infuriated, for you had better not touch him at all; it will do him no good, but an injury, to strike a blow, unless you can frighten him. As soon as you have so frightened him that he will pay some attention to you, approach him again, and caress him a good deal, and then put the halter or bridle on; but a horse of this nature should have been haltered before, if practicable. What is now to be done is to implant in the animal, without pain or flogging, a full and undoubting knowledge of the superior physical power which the intellect and ingenuity of man places at his disposal. This is generally accomplished by throwing the horse in the following manner: Fasten a strap round the pastern of the left fore-foot; then taking the other end of the strap in the right hand, and with the left over the neck, take the off-side rein of the bridle; then by pulling it, and lifting the foot at the same time, the horse will be brought to the ground, if he be not a very powerful one. Or the following plan, if the operator prefer, will answer the same purpose; it is frequently adopted by *professionals* in the Western States for throwing very powerful animals. It consists in raising one of the fore-feet of the horse, doubling the knee, and keeping a strap around the fetlock, fastening the foot close to the arm or shoulder. The horse then stands on three legs. Having next put on a surcingle, pass a long strap through it, fastening one end round the fetlock of the other fore-foot. Attach the other to the surcingle when the animal is down, so close as to deprive him of the use of the limb.

When either of the above courses has been adopted, the horse is confined to the ground very nearly in the attitude represented in the *Illustrated London News*, entirely power-

less, in which position he may be caressed or handled as the operator thinks proper.

If he has much fear of any particular object, or there is anything that it is wished to make him accustomed to, it may be now introduced; an umbrella, for instance, may be opened and shut near his face. And by every practicable method teach him—what men and horses are slow to learn—that imaginary dangers cause more fear than realities. This may be done by firing a pistol, beating a drum, and many other experiments. This once accomplished, he submits to the necessities of the case; his spirit of opposition is broken; and by similar treatment he may be taught many things that it is almost impossible to impart by any other system extant.

S. E.

SPARE THE OWLS AND SAVE YOUR WHEAT!

The following sensible letter was addressed to the *Times* in favour of the Barn Owl.

SIR,—In your impression of the 9th inst. I saw a sensible letter headed "An Owl's Larder," from Mr. Ellis, of Leicestershire, who, I make no doubt is a benign gentleman, from his advocating the cause of a valuable and much persecuted bird, viz, the white, or barn owl. Many sportsmen give an indiscriminate order to their keepers to destroy all vermin but the fox, and among them (in many cases in the ignorance of both) the poor owl is ranked. The consequence is, in some districts, they are nearly extinct, and where this is the case the stacks and barns swarm with mice. Last summer I witnessed the getting in of a small stack of wheat in Shropshire, which the owner supposed would yield enough for his family, of wife and three servants, for eight or nine months. All that he got from it fit to send to the mill was $4\frac{1}{2}$ bushels. 400 mice were killed, and as many more, we supposed, escaped. These animals, as well as young rats, require vegetation and water. At dusk they come out, and out at the same time comes the owl. No doubt they were created by an all-wise Providence to keep these vermin under, as the rook is for the destruction of the wireworm, and the toad for slugs. If it were not so we should be eaten up. They know by instinct how to go about their calling better than we do. If the rook and owl do pilfer a little at times when pinched by hunger, the labourer must have his hire; and with all our sagacity we cannot master them like they can. The cat kills more game in a season than the owl in his lifetime, and the farmer, with salt and chemicals, which cost him a good deal of money, cannot keep the wireworm out of his land.

In former days, in the country, they had the "owlert" hole in their barns, as regularly as the pitching hole, for his ingress and egress, many of which I find are stopped up. During five summers in the vicinity I have mentioned, I have only seen one owl skimming the meadows at nightfall. This year an unfortunate one flew over the cricket-ground at dusk one evening, when the first thing that occurred to a young sportsman was to fetch his gun and shoot him. This is being worse than people we call barbarians, for in India they religiously, and by law, protect two useful birds—the Brahmin kite and the adjutant. In Barbary the stork is safe, where they say, "On the houses they choose for their nest no evil cometh."

I remain, your most obedient servant,

London.

ORBILIUS.

THE SUBSTITUTION OF BARLEY FOR OATS IN FEEDING HORSES.

TRANSLATED FROM THE FRENCH.

The extreme drought of 1857 having considerably reduced the return of oats, the sowings which we hoped to find sufficient for our wants have not answered our expectations. From the month of January we perceived that the harvest of 1858 would be deficient, and we requested one of our neighbours to lend us a crusher of the manufacture of M. Cambay hoping by its employment to reduce our consumption of oats. This neighbour did not employ it, being under the influence of his servants, who finding that it added considerably to their labour by its use, had in a manner refused it, caring little otherwise to economise their employers' oats. This neighbour kindly granted our request so much the more readily, that, according to him, his crusher was of no value, as his servants could not make it work. Having examined the mechanism, we found that they had placed in the gearings, for purposes too apparent, small pieces of wood, which absolutely stopped the working. After having removed the obstacles, cleaned and greased the machine, we got it to work well; but it did not continue long on account of the system of the cylinders, which were grooved, the edges of which were soon blunted, to the extent that the grain passed without being crushed. We have since replaced this crusher by one of M. Legendres *flattening* crushers (*aplatisseurs*), from St. Jean d'Angely, the cylinders of which being smooth and solid, are almost indestructible. It is also preferable for the grain to be flattened rather than broken, because in the latter case it forms itself into flour, which clogs the mouths of the horses, and flies into their eyes and nostrils when they blow over it.

I state these facts only to point out on the one hand that very frequently the employment of machines in the hands of malevolent or inexperienced persons become useless, and, on the other, that a system, however attractive at first inspection, sometimes fails in practice.

By means of this instrument we have been enabled to reduce to one-sixth our allowance of oats, and might probably reduce them still more. Oats crushed or flattened double their bulk; barley increases in bulk only one-third. In the meanwhile the stock of oats is being reduced; and the price having risen much above the ordinary rate, we entertained the idea of replacing it by some other kind of grain. M. Millet, who had resided a long time in Spain where barley is exclusively substituted for oats in feeding horses, persuaded us to adopt its use. We have still a sufficient stock of this grain (spring barley), which we had intended for the use of our people, but at the low price of wheat there was no perceptible economy in such an application of it, and we did not hesitate to give them pure wheaten-bread, in order to appropriate the barley to the feeding of the horses.

The price of oats at the beginning of March, 1858, was already, for winter oats weighing 50 to 51 kilogrammes per hectolitre, from 10 to 11 francs; and for spring oats weighing 40 to 41 kilos. per hectolitre, from 8 francs 50 cents. to 9 francs. Spring barley of good quality, weighing from 62 to 63 kilos. per hectolitre, worth 8 f. 75 c. to 9 f. Besides this, we knew that the weight of the oats includes all the husk which covers the grain, whilst barley has only a pellicle, the weight of which is much below that of oats. An equal weight of barley, therefore, contains a much greater quantity of flour, and is consequently more nutritious.

After making some calculations we have been satisfied that the employment of barley in feeding our horses will effect a considerable saving, and we decided, in spite of some little resistance on the part of our labourers, and blame from some of our neighbours, that barley should henceforth replace oats in the daily rations of the stables. These contained four stout horses, two of them five years old, and about 15½ hands high, and the other two rather smaller. It only remained to determine in what proportion with the oats we should give the barley.

One of the strongest of our horses is employed in two ways. He ploughs, does the carting of the farm with the others, draws our four-wheeled carriage, goes in the tilted cart, and sometimes is used for the saddle. This double service requires a little more food in corn than was given to the other horses which were exclusively employed in tillage. It was resolved that the ration per day of whole oats 17½ pints (10 litres), at the periods of heavy work, reduced to 12½ to 14 pints with lighter labour, should be replaced by 11½ pints of barley. The other horses being rather smaller, and which received in times of heavy labour 9 pints of oats, reduced at other periods, was allowed about 5½ pints of barley, reduced according to circumstances, as with oats. The two other horses, which were allowed 14 pints of oats during heavy labour and reduced according to circumstances to 9 or 10 pints, were allowed 9 pints of barley, with reductions according to the work.

The hay which our horses were then eating was not of the best quality; we gave them about 24lbs. each per day: this was a large allowance, but that of straw had been withheld during the winter on account of its scarcity. The harvest of 1857 yielded but little forage or straw, at least with us; the straw was preserved for the flocks, and what they rejected was used for litter. Our horses and cows were littered with young heather well mixed with herbage, forming a litter sufficiently fine and proper for dung. Our dung-hill bottoms of this year being composed chiefly of marly earths, we have renounced for the season littering the stables, &c., with marl, which would have supplied a compost unsuitable to the nature of our soil.

Barley was supplied to our horses broken or flattened, and in spite of the fears of our labourers and neighbours, and even the doubts of our veterinary surgeon, *they have preserved their spirit, vigour, a shining skin, and good health*; and our saddle-horse has not relaxed in his pace. In the meanwhile our teams have been employed in working the Dombasle plough, drawn by two animals only, on all our fallows, which are of a close nature, stony, and often in rather steep undulations. The work is continued at an average of ten hours, and sometimes more.

The ejections of the horses exhibit no indications of the barley they receive, and it was not till the 6th July that they ceased to have that ration, and resumed the winter oats, of which the crop, injured by the frost of the season, has been very scanty. We give it to them flattened, and in less quantity than of the spring oats.

What led me to speak of the ejections of our horses was, that one day in going to Loches, the chief town of the Arrondissement in which we are situated, we observed upon the road horse-dung that was *literally crammed* with grains of whole barley; and we judged from that, that if our horses had received their rations of barley *unbroken*, we should have seen justified the prediction which we had opposed, namely, that our horses would lose their strength in eating barley. In fact, a great part would have passed into the stomach and intestines without being digested. Another observation that we have made is, that since our horses receive their corn broken or flattened, the fowls no longer come to scratch in their dung to seek there the nourishment ejected from the stomach of the animals.

An old soldier has assured us that in mixing whole barley with cut-straw, the horses would masticate and digest it better. This is worth a trial.

Since the experience of three months has proved to us that broken barley can well supply the place of oats in feeding horses, without injury to their vigour or health, let us see by a reference to figures, what are the economic advantages to be derived from this substitution :

		s.	d.
1 Horse	17½ pints oats	0	8¾
„ „	10½ pints barley	0	5¾
	Saving	0	3
2 Horse,	8½ pints oats	0	4¼
„ „	5¼ pints barley	0	2¾
	Saving	0	1½
2 Other horses,	28 pints oats ..	1	2
„ „	17½ pints barley..	0	9
	Saving	0	5

The saving for the four horses is, therefore, as follows :

First horse	3d.
Second horse	1½d.
Third and fourth horses ..	5d.

9¼d. per day.

Or £14 8s. 11½d. per year.

The prices current given are those of the markets of Bléré, Amboise, Loches (Indres-et-Loire), for 1858.

It appears that at the last market of Bléré, which is important, oats were worth 12 francs per hectolitre.

I ought to state that it is rarely that oats reach and retain the price they have done since the harvest of 1857, and that it ought to maintain and even surpass it after that of 1858. Spring barley rarely exceeds the price of 10 or 12 francs per hectolitre. That of winter barley, or *escourgeon*, being lighter than that of spring, but heavier than even winter oats, never attains those rates.

CORA MILLET,

(Corresponding Member of the Imperial and Central Society of Agriculture.)

The following observations on the same subject, are translated from the *Agricultural Chronicle*, of the second fortnight of July 1858, in the *Journal of Practical Agriculture* of that month.

“ Our readers will see that Madame Millet has shewn that the crushing of oats admits of a diminution of allowance in a given proportion. This consequence has been strongly opposed by M. de Behague, who adduces an experiment, in which he had found a team considerably weakened by the new system. But Messrs. Renault and Moll have satisfactorily explained the anomalies that they had observed in the use of crushed or flattened oats. After crushing, that grain is nearly doubled in volume or bulk; and many agriculturists who distribute the allowance to the cattle by bulk, have given in crushed or flattened oats the same measure they were accustomed to supply of whole oats, which was exactly to reduce the food to the extent of one-half, imposing upon the animal a severe fast. It is by weight only that we can compare different allowances, such as has constantly been done by M. Dombasle. To conclude this incidental question, let us add that according to men who fully understand horses, and feed a great number of them, the crushing is of no real service except to old animals; whilst for young horses, and other animals in the strength of life, it is desirable to continue giving them whole oats.

“ But it is no longer a question of oats, but of what can be substituted in lieu of them? Madame Millet recommends crushed barley, in the proportion of 5¼ pints of barley to 8¾ pints of oats. M. de Behague thinks that rye boiled may be recommended, in the same proportion with oats as is given in barley above. M. Bella states that he has found it useful to replace half the allowance of oats by an equal quantity of boiled rye. M. Bailly, who commonly gives about 20lbs. of oats, has substituted for this allowance 15¼lbs. oats and 4¾ lbs. of boiled rye. Everybody has acknowledged that too great a proportion of either barley or rye occasions founderings, whilst no inconveniences are experienced by mixing them in proper proportions. As to the manner of administering the new food, opinions appear to vary considerably; and the question appears to us to be determinable only by extended experiments. M. Delafond is of opinion that we ought to be contented with a simple maceration in water; the rye being put into a cask, water is poured upon it to the extent of filling up the interstices, and at the end of six hours

the grain is quite fit for use. M. Delafond thinks that this maceration is much better than boiling, which furnishes a food too pasty. It is proper to state that the siliques of colza mixed with the boiled grain remedies in part this inconvenience, and otherwise form of themselves a nourishment that ought not to be neglected. We may add that in lieu of barley or rye,

buckwheat or steeped maize might be used instead of oats: even wheat may be substituted, if treated in the same manner by maceration.* This must be arranged by individuals, so as to give the least costly and at the same time the most wholesome food, consulting the averages, and substituting one grain for another, taking weight for weight."

DEFICIENCY OF SUPPLIES OF FLAX.

Notwithstanding the enormous increase in the foreign imports and home production of fibrous materials, the manufacturers are all complaining of insufficient supplies. Flax, cotton, wool, and other animal and vegetable substances used for spinning, weaving, &c., are greatly behind the demand for manufacture, and for consumption and export. The mill-owners and manufacturers are now putting their shoulders to the wheel, and trying to remedy this evil. The provincial journals are filled with notices of meetings of the various parties interested, to consider the best plan of operation for bringing about the desired effect. Chambers of Commerce, manufacturers, and mill-owners are laying their heads together, to decide what are the best steps to be taken to draw hither larger supplies.

The Manchester cotton-spinners have formed their Cotton-supply Association, and are moving energetically, calling upon every producing country, and every locality fitted to raise cotton-wool to send their increased supplies.

The woolstaplers, and wool manufacturers also, of Yorkshire, have just been agitating for further supplies of the raw material, and are casting their eyes about to discover from whence they can draw larger quantities of wool. And now we perceive the flax-spinners and linen manufacturers are in equal straits, and are seeking to promote the culture of Flax in India and elsewhere.

Now let us examine the position of the supply of this important raw material.

According to the latest returns, there appear to be now in the United Kingdom 417 flax mills or factories, with about 1,300,000 spindles, and 8,700 power looms, employing 80,260 persons. Of these, 130 factories are in England and Wales, 168 in Scotland, and 110 in Ireland. Scotland and Ireland employ two-thirds of the hands, and keep 846,000 of the spindles going. Now by the present accounts from Ireland, we find that there are now, on the average, of idle and partially employed spindles about one-eighth of the whole number, that whole number being about 600,000; and all the mills totally out of work, caused chiefly by the dearth and scarcity of the raw material. The imports of foreign fibre for the past year fell far below the requirements of the trade, and the home cultivation does not extend proportionately to the demand. In the last twelve months the price of hand-scutched flax has advanced nearly 50 per cent. Capitalists (we are told by the organ of the Irish linen trade) ready to invest

largely in the erection of power-loom factories for the weaving of linen, are kept back from engaging in the enterprise because of the state of the markets and the famine rates for flax. The produce of the 250,000 acres now under cultivation with flax in Ireland is fully absorbed by the wants of local factory owners and the demand for continental markets. Supposing, too, any free-trade measures were carried in France, the linen manufacturers of that country would be able to take 10,000 tons per annum of that quality of flax which cannot be raised on their own lands. The Irish flax-spinning trade, we all know, is of vital importance to the general commerce of Ulster: every incidental circumstance that affects the linen manufacture gives its peculiar tone, in a greater or less degree, to all other sections of trade, from that of the highest merchant to the humblest shopkeeper.

But it is not only Ireland that is affected by this deficiency of supply; the evil presses equally great on English and Scotch spinners. Hence the linen manufacturers of Dundee and Leeds are uniting to consider their prospects and the remedies.

The Chambers of Commerce of these two towns have agreed that a Flax-supply Association, composed of the various flax spinners and manufacturers in Great Britain, should be formed, and a fund raised to send out intelligent and practical men to instruct the natives of India in the growth of flax, and to point out to them the advantage that would accrue to them by improving the quality of the flax straw.

Although there is necessarily a limit in this country to the extended cultivation of flax, owing to the exhausting nature of the crop, and the stipulations in leases, which, in many cases, prevent its culture, yet there is no reason why in India and our Colonies, where there is abundance of cheap land at disposal, its production should not be stimulated and extended. In India it might be produced in abundance; and there does not appear to be any valid or sufficient reason why, with land so much cheaper, and the cost of labour so trifling, the fibres of India—some of which excel, if they do not surpass, the best of Europe—should not, with a little encouragement, care, and perseverance, become a large and constantly increasing item of import here.

Four years ago the Agri-horticultural Society of the

* This grain is now cheaper, measure for measure, than barley, oats, or beans, and its use in feeding cattle and pigs is extensively practised.—*Translator.*

Punjab took very active measures for the promotion and extension of flax culture in India, having special regard to the fibre. Even the present limited cultivation of flax, carried on solely for the sake of the seed as an oil-producing staple, is considered remunerative by the landowners and growers; and the more important produce, from its fibre, would necessarily very considerably increase the profit to be derived from greater attention to the culture, &c.

Several tons of the best seed were ordered out from England. Premiums were offered for the largest extent of land placed under cultivation with it: liberal prices were offered for the produce. Several sets of heckles, of the ordinary kind in use amongst the flax-growers of Ireland, such as the natives might be taught to use with little difficulty, and which would enable them to prepare a fair merchantable article, were ordered; and a dozen combs, used for stripping the seed, with a few handbrakes, made on the most approved plan as models, should the flax cultivation be greatly extended. In the course of a year or two subsequently, the land under flax in the Punjab produced, we believe, about 5,000 tons of seed and 15,000 tons of fibre; but we have not heard what was the quality or pecuniary result of the experiment on the fibre, or what was the opinion entertained of the article exported.

But growing flax is not growing rice, or oil seeds, or

pulse, in the careless and mixed manner of the Indian natives; nor is the preparation of it to be left to inexperienced individuals. Something more than combs and heckles will be required before an article will be produced in sufficient quantity and quality to compete with the home-grown material, or even to supply the place of that from Europe and Egypt. Unless the most improved methods of preparation are adopted—and the cultivation will require a vast deal of care to meet the desideratum—a superior fibre will not be produced to realize a sufficient price to pay all concerned.

The importance of the question of flax may be judged of by a comparison of the progress of production, manufacture, &c. In 1850 we imported 1,822,918 cwts. of flax, dressed and undressed. In 1857 our foreign imports only reached 1,624,264 cwts. The quantity of linen and yarn exported in 1850 was in value £4,845,030, and the quantity kept for home consumption was valued at £9,700,000; together, £14,545,030. In 1857 the value of the linen and yarn exported was upwards of £6,000,000; and if we assume the proportion used at home at about £11,000,000, we have a total of £17,000,000. But there are the other products of seed, oil, and oilcake to be added, which bring up the total present annual value of our commerce in flax to nearly £22,000,000 annually; making this a very considerable interest.

ON LABOURERS' COTTAGES.

The slow and very gradual upward progress of the social system renders it very probable, if not absolutely certain, that much time will yet elapse before the amelioration of the labouring classes be placed on the permanent security of deriving an adequate competency from the awards of social distribution; and until this only true and legitimate ground be obtained, which can only apply to a generation yet unborn, the existing race can only be benefited by the humanity and kindness of their employers, who are men of wealth, or who are prompted by benevolence to extend the means of comfort to the labour which supplies every demand and operates every enjoyment. The social system affords but a scanty recompence for the toil and sweat of labour; and when this irksome bondage is accompanied with an uncomfortable accommodation, the burden of life approaches an almost insupportable condition. The lowermost grade of society is placed far from the advances of the improving world, and much time is spent and a long misery is endured before the progress of amelioration reaches the abodes of poverty and neglect. A comfortable accommodation is fully equal in necessity to the adequate supply of the necessaries of life: the want of the former destroys the enjoyment of the latter, and the external sensations are as acute and affecting as the inward appetites and cravings of nature.

Till within the currency of the present century, and in many places at this present time, the single cottage

of a labourer is limited to one apartment, on the ground-floor, in which the whole family is huddled as in a pin-fold, where the decencies of life cannot be preserved. There is no second-floor; and the beds being placed on the ground, the habitation is nothing better than the stall of a stable, in which the animal eats and sleeps, and performs every function. But this very shameful arrangement has been gradually removed by introducing the second-floor for the sleeping apartments, and also some back premises for scullery accommodation. This alteration has proceeded from manufacturing towns, which have ever formed the germs of freedom and the cradle of human improvements. Yet very much remains to be done: in many districts of country no change has yet happened; the old buildings remain, and even form patterns for new erections. Within not many years past, the provision of better cottages and general accommodation for the labourers, both in town and country, has engaged very considerable attention; and various publications have been made, of designs for dwellings, with estimates and general observations. Our remarks will notice these designs in detail, and conclude with our own ideas, which have been derived from a very extensive practical acquaintance.

The first notice alights upon a book of designs that has been devised and published by Mr. Weaver, an architect, of Somersetshire. These plans adopt the very essential requisite that the sleeping apartments be placed on a second-floor, and the elevations are very justly

corresponding with that idea. But the accommodation on the ground-floor is confined to one sitting apartment joined with a wash-house and pantry, and a wood-house is some times attached. This provision is little or nothing better than the old and yet prevailing pinfold, or stall, in which a whole family is contained, and huddled together without distinction of age, sex, or the occasion of meeting together. A scullery and pantry are filthy though necessary adjuncts, and never should form an integral part of any accommodation, but merely an attachment for the purpose of making more useful the body of the habitation. The front of the single cottage extends only in the length of one room, and consequently is wanting in the lively appearance which is presented by the house of two rooms, and the door being in a porch attached to the east or west end of the cottage is deprived of the sunny warmth which is very conducive both to comfort and pleasure. In most cases the door in front of any house is most inviting and also most agreeably convenient. A narrow front, with a length backwards, does not convey an agreeable idea of a house, nor does it present an aptitude of an equal degree with the extension in front. If two rooms be so placed, one behind the other, the posterior one is cold and gloomy, instead of being accessible to light, and hence enlivening. In large erections these positions are unavoidable, but in the case of cottages the adoption of an open front is easy. Mr. Weaver places one cottage wholly behind another; and the latter being only one room in width in the front, gives to the group of two cottages an ill-arranged appearance, besides altogether immuring the posterior cottage and shutting it out from heat and light. Equally unhappy is the placing together in an angle the doors of two distinct cottages; in the case of four being grouped together, it brings into too near a contact the business of two families, the mixing of which causes jars and broils and endless quarrels and disputes. The fire-place of any house is awkwardly fixed right opposite the door, as in several of the present designs: it is best placed on a different side of the cottage, or has the door opening upon its site, and concealing the view.

The style of building, the Old English, is probably the best for the cottages of the country; but Mr. Weaver's is perhaps too ornamental, and the very plainest kind is most becoming for the country labourer; and for upper servants the style may be a little advanced. The roof projecting at the eaves and over the gables very much protects the walls, and is a good adoption. A porch to the front central door is also a useful addition: it affords some little interior room, and breaks the front line of uniform sameness.

The cost of Mr. Weaver's cottages is high, from £100 to £150 in each separate design. Our own experience and extensive correspondence has found the average expense of a single cottage to be £80 to £90; and it understands plain work and no ornaments whatever. The cost of cottages should be expended in providing accommodation, and not in useless devices.

There is a very great want in the designs now noticed in the total absence of any back premises, as poultry-house,

pigstye, wash-house, and for fuel and ashes. As before observed, these accommodations should not form an integral part of any house, but placed behind the cottage, and built in a low elevation. A square area behind the cottage is the most convenient arrangement, and we think Mr. Weaver has very much neglected the labourer's comfort in not showing these very necessary appendages.

The explanations of the designs are short and meagre; the digging of the foundations, the draining of it, the flooring, and the site and aspect of the cottage are little noticed or altogether omitted, and the mention of a garden nowhere occurs. This article is the very first accommodation in providing country cottages.

We meet Mr. Weaver's views most cordially in having the sleeping apartments in three rooms, on a second floor sufficiently elevated; and we like the style of building, though the cost is too large. Here our agreement stops. We wish to see two rooms on the ground floor—a sitting-apartment, with boiler and oven; and a better room; a back area with the small accommodations, and a garden attached in not less extent than one-eighth of an acre in extent. There is a want of variety in the designs; all the plans are square in the shape, similarly designed, and uniformly elevated. Besides the square and the rectangle, there are many forms which may constitute a cottage, single or grouped. Variety is pleasing; and a uniform sameness tires the observation and palls the appetite of curiosity. The inventive power seems wanting, which, beyond all other qualities, stamps the professional aptitude.

A book of designs for the dwellings of the labouring classes has been composed by Mr. Roberts, who is honorary architect to the Society for Improving the Condition of the Labouring Classes, and published by the Society at Exeter Hall. The plans have relation to buildings in cities or towns, and also in the country; the former being joined and largely grouped, and the latter all double or two together. The same objection exists as in Mr. Weaver's ground plans—in having only one living-room with scullery, which latter is only a useful appendage, and not a special division. The porch, opening by an inner door into the living-room, is formed inside the house, and consequently occupies a space of the apartment unnecessarily, as it can be placed outside, and not interfere with the inner extent. A second-floor is most justly allotted to the sleeping apartments; and the size is very conformable. The style of building is very neat and appropriate; the elevation is suitable, and the proportions just. But a still more uniform sameness prevails than is seen in Mr. Weaver's designs; the plans differ little or nothing in the arrangement of the apartments, or in the elevations. The ground plans are entirely the same throughout, in a front living-room, with a scullery behind, and extending longitudinally or laterally. The only difference is seen in the porches being alternately placed outside and inside the dwelling, and in the elevations being wholly plain, or having a gabled front placed on alternate sides of the two cottages that are joined together. The front of one cottage is plain, and the other gabled, and in the next plan the

position is reversed; and another design has a wholly plain front, and placed between the alternated ones. Such is the utmost stretch of the variety that is shown.

The objection is repeated which was urged against the last-mentioned book of designs, that no back buildings are devised, which are so very essential to the comfort of any human habitation. The fuel, ashes, firing, pig, and poultry should and must be accompaniments to the rural dwelling, and the want of them forms a most miserable and glaring deficiency. The wash-house must not be forgotten, as cleanliness is a great promoter of health, and the filth of its processes must be removed from the living-rooms. And the want of a garden in both sets of designs shows an ignorance or carelessness that is incapable of making the arrangements that are universally known and generally acknowledged to be essential to the comforts of labour. It may be said that these adjuncts are left to be added in the circumstances of the different localities. On this understanding, the fact should have been mentioned and explained in an accompanying essay or notice, as an implication of any essential truth betokens a deficiency of statement, and a total want of it may suspect or establish an utter ignorance.

The Royal English Agricultural Society has awarded to Mr. Goddard, architect, Lincoln, a competition prize for the best essay and design on the subject of labourers' cottages. The designs contain two cottages joined longitudinally, and each dwelling has on the ground floor only one living apartment, with a scullery or pantry behind. The want of a second sitting apartment renews the former objection. The arrangement of three bed-rooms on the second floor is most proper, and the elevation of the cottages is very just. The author has made a very valuable step beyond Messrs. Waver and Roberts, in forming a back area of small buildings, which makes a large addition to the value of the designs. The door of the cottages is placed in the ends, and there is only one to each dwelling—consequently the ventilation will be imperfect, owing to the want of a traversing current of air between two doors when placed on the opposite sides of a house, and cleanliness will be prevented, and filthiness encouraged by every ingress and egress from one door. This objection is a fatal one in point of health and comfort.

In any of the publications mentioned, no notice is made of the site of the cottages, or of the aspect which it obtains. This consideration is of much value in the formation and location of human dwellings. The climate of the country in most cases must determine the position of the habitation; and in Britain the most eligible direction is that the front of the house embraces the south, as being the mildest and warmest quarter of the heavens. In South Wales and in the south-west corner of England the south is a rainy and stormy point, and the front of houses is necessarily turned from it: but in all other parts of the kingdom the south is the preferable quarter; the west is generally boisterous and rainy; and the east, though bringing sharp colds, is drier than the west, and less stormy. When the nature of the ground, or any local circumstances, render

necessary a deviation from the southerly position of dwellings, the front is best turned to the south east, but not reaching the full complement of the quarterly division of the compass. We find that the ancient Romans, with their usual acuteness, paid an essential regard, even in the mild climate of Italy, to the position of their dwellings, and gave directions not to be mistaken: "Ædificium, unius lateris longitudine in quo frons erit, meridianam partem respiciat: in primis angulo recipiens ortum solis hyberni, et paululum ab occidente avertatur hyemali. Ita proveniet, ut per hyemem sole illustretur, et calores ejus æstate non sentiat et lecto fruatur aspectu" (Palladius, de Re Rustica). This rule can be applied without exception all over Britain, especially in the northern parts, where the west winds are very boisterous and rainy; and even in South Britain, where the southerly winds are very wet and boisterous, and maintain the character of "pluvialis auster," the easterly frontage of dwellings is preferable to the western quarter, which is more windy than the east, but less rainy than the south. It has been recommended to place a cottage so that the sun shines on every side and end of it during the daily circuit of the heavens, and this position will require the front to face the south east; the east end of the house would receive the rising sun, the front will be warmed by the rays of the midday, the west end will receive the afternoon sun, and the back part be cheered by the last effulgence of the setting luminary. But many circumstances will concur to prevent the adoption of this rule to any extent.

Having stated our objections to the designs of the three chief contributions of the present time in the matter of labourers' cottages, and having noticed the points of agreement betwixt the arrangements which these books contain and the suggestions of our own experience, we proceed to lay down these our notions on this very important point, and to state such reasons and give such directions in advance as are justified and can be allowed by the irresistible current-going advancement of human civilization.

Our introduction consists in three adoptions—that every cottage have two living apartments on the ground floor, three sleeping rooms on the second floor, and a back area of small accommodations, where the acts of cleansing are performed, and where articles are concealed which never should be seen. Having laid down these premises, we proceed to describe the accommodation and building of a cottage in the ideal, and at the same time the very possible conditions.

The foundation must be dug to a solid stratum of some hardened body, on which a building can be raised. A depth of two feet will generally find a firm foundation, and the trench must be at least three feet in width, which will allow a projection of 9 inches on each side of a wall of 18 inches in thickness. The undermost layer must be formed of large flattened stones of sufficient weight to take and retain a very firm bed, and afford a secure resting for the wall. Where stones cannot be got, a bed of concrete or bricks must be used, and projecting on each side of the wall, on filling the trench. The bottom of the excavated area of the cottage must

have an inclination sufficient to carry the water to one of the four corners, where a drain will receive and convey it from the dwelling. The whole area must be filled with small broken stones to the height on which the floor of the cottage will be laid, and the top filled and levelled with mortar, for the purpose of supporting the flooring bricks. This interstitial cavity below the floor, and the water being gathered to a corner by the slope of the bottom of the excavation, and carried away by a drain, will provide a dry flooring to the cottage, which is a most essential advantage to any human habitation. The thickness of the walls may be 18 inches of bricks, or 2 feet of stones, and treated with mortar in the usual way. The sub-division walls will be 1 foot of thickness in bricks. The height of the walls above the floor will be 14 feet, which will place the bed rooms in the side walls and partly in the roof; or the height of 18 feet will allow the walled position of the sleeping apartments. The pitch of the roof may be 1-5th above the rectangle; and slates are the best materials for covering, and tiles next, and then thatch, which admits a flatter hypotenuse or side of the roof. The roof projects over the gables and side walls, as it tends much to keep the walls dry, and is also a kind of ornament to the humble dwelling.

The exterior length of the cottage is 40 feet, which allows two living apartments in length, and of very sufficient size, after deducting the width of the inner and outer walls. The width is 20 feet over walls. The door of entry is best in the front of any habitation, and must be central, and dividing the house into equal halves. A porch is a useful and ornamental appendage, as it affords some little interior accommodation, and breaks the exterior sameness of bare walls. Like the preface to a book, it may indicate good treatment and comfort within. The back door opens behind, in the furthest corner of the back wall of the living apartment, and leads directly into the back area; ventilation is thus promoted, and not by a blast or strong current of wind, as when the front and back doors are placed directly opposite, but by a zigzag direction of air, which introduces fresh respiration, and removes the contaminated effluvia, without causing any perception of colds or currents. The side walls of the ground floor rooms are 9 or 10 feet high, in order to give the inestimable advantage, along with the constant introduction of unrespired gas, of the inmates breathing in a large volume of air. This point has ever been much overlooked; but not one is deserving of more serious attention. It must be joined with the removal of every filth from the living apartments to the back area of small accommodations. The floors of the rooms are paved with flooring bricks, and the best room may be boarded, as local circumstances direct. The walls are covered with two coats of plain plastering, and the roofs of the rooms are ceiled. When the bedrooms are placed partly in the roof of the cottage, the ceiling will be fastened to the purlings and joinings of the bearers. The flooring of the sleeping apartments is of plain boards, and grooved. The stair springs from the kitchen at the back wall, and rises to the second floor, in the centre of the

cottage. The cavity beneath the stair affords a cellar of neatness and convenience. The best room is provided with a small fire-place, of the common size; and in the kitchen is placed a fire-place of larger dimensions, with an oven and boiler, on each side of it. These articles are the permanent occupants of the cottage.

The back area of small buildings is confined in extent to the length of the cottage, and extends backwards in the extent, to admit the necessary number of accommodations. These small houses are—washhouse, fuel, ashes, privy, pig-sty, lumber, and poultry-house. The exterior surrounding wall is 10 feet high, and the buildings lean to it, with one side of a roof, and are 12 feet wide. Poultry are natives of a warm latitude, and require much warmth; and they form a very agreeable and profitable employment to the labourer's family. It is a good design to place the poultry-house under the roof of the cottage, and forming part of the house, occupying a width of six or eight feet between the two fire-places, and thus enjoying the heat of the fuel. The door opens backward into the area, and being provided with a pane of glass in the upper part, will admit the necessary light. The length of forty feet will allow two sufficiently large apartments after the deduction of the poultry-house; when it is not introduced the cottage may be thirty-four or thirty-six feet in length. The placing of the poultry-house in the immediate contiguity of warmth is a large improvement in the designing of labourers' cottages. The back area or open space is indispensable for the feeding and assembling of the animals.

The site of cottages should be on dry ground, near to or fronting a road, and surrounded by or forming the front line of a garden of one-eighth or one-sixth of an acre in extent. The aspect is best in the south and south-east quarters, for the reasons before given; and, in the words of Palladius, "ita lecto fratur aspectu." The preferable style of building is the plain Old English, with as much ornament as fancy or ability may direct. The two vents will form two chimneys in the centre of the cottage, standing on a square platform across the roof, and joining in the angles of a square or hexagon. The windows are of diamond panes of glass, in light iron frames; and one-half must be made to open, and that at pleasure. The northern parts of the kingdom require the stronger construction of wooden sashes and timber frames. Climate is the parent and promoter of ornament; and the substantial naked style of building in Scotland has been compelled by the boisterous and savage elements to which external fabrics are exposed. This consideration will have influence in choosing the aspect and fixing the style of execution of buildings.

The preferable mode of supplying water to all country buildings, as farmeries and cottages which are not far distant, is, by seeking a spring of water in some higher ground, and directing it, or a natural issue of water, in a covered conduit or pipe to a cistern or tank to hold a quantity, from which a pipe will convey the water to every required locality, and the consumption regulated by a hallock. One pipe will serve several

cottages; and the rain-water from the roofs of all the houses, collected in a cistern, will supply a jet of water after each occasion in the privy, which will convey the excrements in a sloping direction to the ashes-house, where a rich compost will be formed of the mixtures for the use of the garden.

Such a cottage as has been now described will cost the average sum of £80 to £90; and this upon our own authority of experience and much inquiry, which is corroborated by Mr. Goddard's estimates in the prize designs to the Royal English Agricultural Society. The estimates of Messrs. Weaver and Roberts, before noticed, seem to us to be too high. It is wholly useless, and very injudicious, to expend on such matters an expense beyond what the social system will allow, or to force an advancement till circumstances are in existence to support it. It is very readily conceded that this support is now alive, and has existed for some time, and most loudly demands the extension of an imperious benevolence in the affair of the accommodations of labourers. But with this very strong auxiliary inducement, a prudential caution is always to be recommended, as a much too far advanced movement very frequently causes a retrogression or a noxious stagnation. Palladius, before quoted, expressly says, "Ædificium, pro agri merito, et pro fortuna divi, oportet institui."

Though this pointed observation may not now apply in direct force at this day, yet the meaning is evidently circumstantial—that cottages be built according to the estate of the inhabitants and the ability or benevolence of the proprietor; for such are the ruling directors of our times, and by them all movements in such matters must be governed.

The expression of Palladius is quite in accordance with the fashions of feudalism—that the condition of the labouring class depends on the charity and benevolence

of their employers, and also upon the value that accrues to the rich from the employment that is exacted. Labour has not yet risen above this degradation, and all the boasted civilization of the present age has not emerged from the mud of the feudal arrangements. In the country, more especially than in towns, the labourers depend on benevolence, and many steps of advancement remain to be surmounted before the total emancipation be effected. In the meantime a gradual progress goes on very steadily, and the present purpose consists in leading the progression in a judicious manner, and by no means pushing so far a-head as to lose sight of the essentially attendant circumstances. These are the social conditions of labour, as marked by the grades of society, and the manners and habits it possesses of following the career of advancement. The latter must be chiefly guided by the former consideration, and be regulated by their instructions.

When cottages are grouped by any number being joined together, an expense is thought to be saved; but we agree with Mr. Weaver, that grouping is not eligible beyond four dwellings, or rather should be restricted to two cottages, which may be joined by a longitudinal central wall, along which are placed the best room and the kitchen; the former constituting the front of the cottage, and the latter joining the back area, and opening into it. Such cottages have the ends for front, and the door is in a porch on the side, and placed in the joining of the kitchen and best room. The porch opens in the line of the cottage, and consequently the door enjoys the benefits of the chosen aspect. The end of the cottages lines the gardens, through which a side-entry leads to the back area. A number of cottages placed together occasions much scandalizing and gossip, and idle assemblages.

THE GROWTH AND MANAGEMENT OF AN ORCHARD.

BY PROFESSOR TANNER.

The orchards of the West of England do not receive that attention which their merits justify and demand. Their value may be considerably enhanced by adopting a judicious system, and I shall endeavour in the following essay to notice the essential points of management upon which success depends.

In selecting a piece of land for an orchard we have to consider the character of the soil and the climate of the district. The character of the soil which is most suitable for the growth of the orchard is indicated by the district in which they flourish most luxuriantly. A review of the apple districts shows that they are on the corn stones and marls of the old-red-sandstone formation. A strong soil is not at all objectionable provided it is of calcareous character, and upon a moderately dry subsoil. They are by no means confined to such soils; but where they are grown successfully upon soils of an opposite character, it is by artificially producing those

conditions which are most desirable. For this reason, although circumstances may make it desirable to raise orchards upon land which is not naturally calculated for them, yet this obstacle can be overcome by the adoption of such measures as will be hereafter described. We thus bring the question of soil within a narrow compass; for with this exception of *excessively* heavy and light soils, there need be no preventive so far as regards the nature of the soil.

The subsoils are more influential than the surface soils. We can ameliorate and alter the latter, but we cannot effect any *great* change in the former. There are none more uncongenial to the apple than poor retentive clays, and especially when they are yellow and acid in their nature. This description of earth is particularly unfavourable for all kinds of vegetable growth, and when the roots of the apple trees pierce into it there is immediately a stagnant growth, which is soon mani-

fest by the unhealthy appearance of the trees. Subsoils of this character may be improved by deep drainage, but they will still retain that peculiarly sour nature which is so repulsive to vegetation.

The climate also admits of considerable latitude as regards the growth of apples, but the quality varies very materially. The Kentish apples are very different from the West-country fruit of Hereford, Devon, and Somerset. The moist climate of the latter encourages a very juicy fruit well suited for the manufacture of cider, but the apples grown in the drier climate of the East of England are remarkable for being dry and full-flavoured, superior for a table fruit, but of far less value for cider. We also have many gradations between the two, but it is clear that the fall of rain and the moisture of the air modify the quality and uses of the apples of the district. The highly-developed flavour of some of the American apples which are produced in hot and dry districts still more forcibly illustrates the effect of climate.

This influence of climate is by no means reserved to the question of *quality*, but extends also to the *quantity* of the produce. In this respect a dry climate in spring or early summer has many advantages. This will at once be evident to any person who has compared the orchards of the East of England with those of the West. In the former districts, when the blossom is produced, their prospect of a crop is *very* much greater than in the moister climate of the West. Here we often have a beautiful promise, but no fruit; and this is comparatively rare in the East of England. This is mainly referable to the greater influence which frost has upon the blossom or the bud when it is moist; and thus the humidity of our western climate renders it exceedingly general. The bud will stand a "black" frost far more safely than a "white" frost.

The aspect of the land has influence on its climate, as rendering it more exposed to the cold winds, which often render white frost partial. Many a spot sheltered from the current of the wind escapes the "hoar" frost, whilst it is general along its course. The natural formation of the district has its influence also, for if the prevailing winds are along the course of the valleys, and these gradually narrow, the volume of the air becomes more and more confined as it proceeds, until its influence is really very destructive both to the blossom and the trees. Orchards thus situated have far more damage done to them than others *apparently* more exposed on open plains. The intensity of the winds in these gradually-contracting valleys is a source of great loss in orchards.

The altitude varies in its influence according to other conditions of climate. In the East of England, it would generally be prejudicial to the quality of the fruit, as the loss of heat would be detected in an apple deficient in flavour. On the other hand, in the West, we find the higher* orchards are often more productive than those below, in consequence of greater freedom from the

"hoar" frost. In the valleys the moisture is always greatest; and here the fogs lie, and hence there is frequently on the low lands a white frost when it is a black frost higher up the hill.

For these reasons, I consider that a calcareous loamy soil upon a dry subsoil is the best for an orchard; that the latter is more important than the former; and that, in selecting a soil for planting in the West of England, we must give the preference to a south-eastern aspect, avoiding alike the damp of the valleys and the violence of the wind which sometimes gather within them.

The first step in the preparation of the field for being made into an orchard is to secure a free and deep drainage. Where this does not exist naturally, it must be supplied artificially. The nature of the soil can alone decide the distance and depth of the drains; it is sufficient for me here to say that it must be done as effectually as possible.

The field, if in good grass, may require little more to be done to it except to secure a proper surface drainage; but should the land be of an inferior character, it may be desirable to break it, in which case I should adopt this plan: Having marked upon the ground the lines in which the trees are to be planted, let the plough commence on this line; and a furrow-slice being turned over, let the ploughing proceed as if for gathering the field into lands, in the centre of which the trees shall stand. A second plough is to follow in the furrow of the first, and throw up its mould over the last furrow-slice. When the first plough returns for its second round, there will be a trench ready to receive the turf about to be ploughed; and, as the following plough completes the work, we get the turf buried ten or twelve inches deep. The work must, however, be done with a narrow furrow throughout. Thus a deep soil is secured: the surface is slightly rounded; but if not sufficiently rounded, it must be done by manual labour.

If the soil is in an unhealthy state this should be done in the autumn, as the frosts of winter will sweeten it very much. As soon, therefore, as the work has proceeded thus far, the trees may be planted as hereafter described, and the working of the land may be proceeded with. This will, of necessity, vary with the description of soil, for whereas a good loam would need little preparation, an adhesive clay must do so. It is far from a sound policy ever to entertain the belief that the trees are to a great extent independent of the land between them, for if such land is in good condition, the roots will meet within a few years. It is, therefore, as important for the early growth as it is for the maturity and productiveness of the orchard, that the soil should be got into a good condition. With the exceptions of our best quality soils, the growth of corn between the trees is objectionable, and for this purpose green crops and grass are decidedly preferable, because they do not impoverish the land of those materials which the apple requires: turnips, vetches, trifolium, clovers, and grass offer abundant choice, according to varying circumstances.

The selection of fruit for an orchard is a point of considerable importance, and local experience comes into re-

* I do not here include very elevated ground, where, of course, the opposite is the case, but I speak of hills of from four to five hundred feet high.

quirement. I have prepared a list of cider fruit from the best districts, with a description of the character of those varieties.

From these the planter will be able to select such as are most likely to suit him. If the climate is particularly favourable and the soil good, the best and most valuable sorts may be selected, care being taken to have a fair admixture of harsh and austere fruit; for the keeping quality of the cider depends upon this latter property. The varieties under such circumstances may not only be select, but also few. On the other hand, when the circumstances are not favourable, the

more hardy varieties are to be preferred, and also a greater assortment, so that if the crop of one tree is lost others may escape; and the irregularity in the blossoming of an orchard thus gives a greater chance of a crop. Sweet apples are generally more liable to lose their crop than sour apples; and often when the frost takes the former the latter escapes. The bright-coloured apples produce, with few exceptions, the best cider, whilst the green fruit produces inferior cider. The quality of cider varies also with the soil producing it, and if we except the calcareous soil, we shall find that the richer soils, although producing more cider, yield

NAME OF FRUIT.	DESCRIPTION.	BEARER.	CHARACTER OF FRUIT.	GROWTH OF TREE.
Alban ..	Red and green ..	Indifferent ..	Firm and juicy ..	Delicate.
Brierley's seedling ..	Yellow ..	Good ..	Firm and austere ..	Free.
Brienton's seedling ..	Yellow and red ..	Medium ..	Firm and juicy ..	Free.
Busberry ..	White and small ..	Great ..	Soft and sweet ..	..
Cockagee ..	Red and yellow ..	Great ..	Soft and sharp ..	Free.
Cornish ..	Russet and green ..	Good ..	Firm and juicy ..	Upright.
Cowan red ..	Red and large ..	Good ..	Juicy ..	Free.
Downton pippin* ..	Yellow ..	Small ..	Firm, juicy and sweet ..	Medium.
Elton's yellow kernel ..	Yellow ..	Good ..	Firm and rich juice ..	Free.
Foxley ..	Orange and red ..	Great ..	Firm and juicy ..	Upright and hardy.
Fox whelp* ..	Dark red ..	Medium ..	Middle-size and juicy ..	..
French crab ..	Green and red ..	Great ..	Firm and sharp ..	Upright and handsome.
Fair-maid of Taunton ..	White ..	Good ..	Hard, mild, sour ..	..
Grange pippin ..	Yellow and red ..	Great ..	Firm, juicy and sour ..	Medium.
Grange apple ..	Yellow ..	Medium ..	Firm and juicy ..	Free.
Glassbury Norman* ..	Pale yellow ..	Medium ..	Small size ..	..
Garter apple ..	Red and yellow ..	Medium ..	Large and juicy ..	Free.
Golden Harvey* ..	Red and yellow ..	Medium ..	Rich juicy fruit ..	Medium.
Green apple ..	White, small ..	Excellent ..	Hard and sour ..	..
Hoghead ..	Deep red ..	Great ..	Firm and austere ..	Upright and handsome.
Hagloc ..	Yellow ..	Great ..	Firm and tart ..	Upright and handsome.
Harveys* ..	Green and russet ..	Great ..	Firm and sweet ..	Upright and handsome.
Hawthorn Dean ..	White ..	Early & good ..	Large and sour ..	..
Jersey bitter-sweet ..	Red and yellow ..	Excellent ..	Hard and bitter-sweet ..	..
Kingstou black apple ..	Small apple ..	Good ..	Rich juice ..	Free.
King bearer ..	White ..	Very good ..	Sour ..	Free.
Large atire ..	Yellow and red ..	Good ..	Firm and sharp ..	Upright and handsome.
Lowley bitter-sweet ..	Yellow and red ..	Very good ..	Austere ..	Free.
Leominster bitter-sweet ..	Red and white ..	Prime ..	Soft ..	..
Maiden's blush* ..	Dark red ..	Good ..	Firm and sharp ..	Hardy and upright.
Marshal erab ..	Yellow and brown ..	Great ..	Firm and sharp ..	Vigorous and upright.
New woodcock* ..	Streaked and round ..	Good ..	Medium size ..	..
New red must* ..	Pale red and green ..	Great ..	Firm and acid ..	Hardy, spreading.
Old red must* ..	Pale red and green ..	Great ..	Firm and acid ..	Fine showy tree.
Pawan* ..	Greenish yellow ..	Great ..	Firm and sharp ..	Vigorous.
Pig's nose ..	Long, red and white ..	Good ..	Mild sour ..	..
Red streak* ..	Green, red-streaked ..	Good ..	Firm and sharp ..	Vigorous and upright.
Red Ingestrie ..	Red ..	Good ..	Firm and juicy ..	Large and handsome.
Romril* ..	Pale yellow ..	Great ..	Medium size and juicy ..	..
Red Norman* ..	Yellow, brown & red ..	Good ..	Large and austere ..	Free.
Queen apple* ..	Red ..	Good ..	Mild sour ..	..
Siberian pippin* ..	Yellow ..	Great ..	Firm and juicy ..	Upright.
Siberian Harvey* ..	Bright red and green ..	Great ..	Firm and austere ..	Elegant and upright.
Stead's kernel* ..	Yellow & russet. apota. ..	Good ..	Firm and austere ..	Small-leaved.
Sykehouse ..	Orange red & yellow ..	Great ..	Firm and juicy ..	Large, spreading.
Skirm's kernel* ..	Streaked and ovate ..	Medium ..	Small and juicy ..	..
Sweet Arthur ..	White ..	Early & good ..	Large and sour ..	..
Slackangal ..	Red and yellow ..	Excellent ..	Hard and sweet ..	..
Trevoider ..	Yellow and red ..	Good ..	Firm ..	Very hardy.
Woodcock ..	Dark red and yellow ..	Great ..	Firm and austere ..	Upright.
Warwickshire* ..	Gold and green ..	Good ..	Firm, aromatic ..	Delicate.
Wine ..	Dark russet ..	Good ..	Firm, aromatic ..	Upright and slender.
White court pendue ..	Yellowish ..	Good ..	Firm and sweet ..	Spreading: fruit pendent.
Whitmore ..	White, yellow and red ..	Good ..	Firm and sweet ..	Luxuriant.
Wormsley ..	Yellow and red ..	Good ..	Firm and juicy ..	Vigorous.
White clustering apple ..	Small apples ..	Great ..	Juicy ..	..
Yellow Siberian ..	Yellow ..	Great ..	Firm and austere ..	Upright and handsome.
Yellow Ingestrie ..	Yellow ..	Good ..	Firm and juicy ..	Handsome.

Those marked with * are considered the superior varieties for cider.

an inferior *quality* than poorer soils. Much of the variation depends upon the management of the cider, and must be considered separately from the present subject, which is confined to the *production of fruit*. If the situation of the orchard exposes it to the wind, smaller apples should be selected, as they remain on the trees more firmly.

There are regular opportunities for the purchase of trees for orchards through nurserymen, and when this can be done with men of character, it saves much trouble and time. There are many reasons, however, why a farmer should not be entirely dependent upon these sources of supply. Of late years the varieties of cider fruit have been very much neglected, and it seldom happens that a farmer can rely upon the sorts he purchases. Besides this, where there is much orchard land, the purchase of new trees becomes very expensive; for these reasons, amongst others, a farmer should be prepared to raise his own fruit-trees, and I now proceed to describe how he should do so.

Carefully selected fruit of the sorts required should be gathered as soon as fully ripe, and stored away carefully for one, two, or three months, until the fruit becomes perfectly mellow. The pips should then be taken out and kept separate, and the sort plainly marked upon each packet. In a well-prepared piece of garden ground, the pips should be planted in February in rows two feet apart, and about eight or nine inches wide in the rows. In the following November let the plants be taken up, all side-shoots trimmed, and cut off close to the stock, and the roots shortened. They are then planted in ground which has been double trenched, at the distance of nine inches in the row and two feet between. In the following November they are to be transplanted again; the side-shoots within one foot of the ground should be trimmed off close to the stem, and those above shortened back a little.

Here they remain for eighteen months, and during this time the plant must have every opportunity of enlarging its stem, and this will be most effectually done by stopping the growth of any side shoot within one foot of the ground, and by checking the growth of any *very fast* growing branches above; but this should not be done except in cases of rapid growth, for a good covering of leaves is calculated rather to feed than otherwise. At the expiration of this time (say in the months of March or April) the head is to be cut off about one foot from the ground, and then grafted. The original stem is now known as the *stock*, whilst the graft is called the *scion*. The scion is carefully fitted against the edge of the stock, and both are bound with wet matting. After this the parts are well covered with *grafting clay*, which is made by beating together three parts of clay with one part of horse-dung. Some persons prefer grafting upon the crab stock, on account of its hardy character. It is also said that they root more freely, and grow more luxuriantly upon poorer soils than better varieties of the apple. It is evidently very important to secure hardy stocks, especially when climate and soil are not very favourable.

Great care is necessary in the selection of grafts, for

apart from the choice of variety, to which I have before referred, there must also be judgment shown in securing grafts which are in a vigorous state. This is necessarily determined by the character of the parent plant. If this is young, there is an energy of growth throughout the tree; whereas when it becomes old, there is a torpidity of growth, and a feebleness of development, in which the graft participates in common with other parts of the tree. Many persons in selecting their grafts are indifferent with respect to this, and much of the inferior fruit of late years is to be traced to this. The grafts should, therefore, be taken from trees of the variety required whilst they are in *their full vigour*.

I do not think we shall be far wrong in admitting that as regards vigorous development we cannot rival the earliest apples which were introduced into England; and much of the degeneracy now observed has, no doubt, resulted from neglect as to the quality of grafts used. In my Prize Essay on the Farming of Devon, it is stated that "After they are forty or fifty years of age, few apple-trees are worth standing, although instances are on record of orchards producing abundantly when 200 years old. The orchard of Buckland Priory, which was one of the first planted in Devonshire, was in full bearing and well stocked at this age."

When the graft has made sufficient growth (say five or six feet from the ground), it must be "headed back." This will be done in the spring after the grafting, if the soil is in good condition; and has been kept free from weed throughout the entire period of the plant's growth. In the following autumn the trees may be removed, and planted four feet apart. Any branches which make an excessive growth should be checked, so as to allow the tree to grow into a nice form. At six or seven years old the tree will be ready for planting in an orchard.

The ground having been prepared for the orchard, we have first to mark out the positions of the trees. These should be planted in rows; but the distance between the trees must be regulated by the climate and soil. If both are favourable, then the trees will make a large growth, and must have proportionately more room; whereas, if they are unfavourable, the distance must be decreased. If shelter is required, then closer planting is desirable; whereas, if not needed, the greater width will admit the sun and air more freely, and stimulate a more luxuriant growth. For these reasons the distance between the trees will vary from 25 feet apart, under unfavourable circumstances, to 50 feet apart where these are favourable; but 35 to 40 feet will be an ordinary width.

The direction of the rows must depend upon local climate. If the situation is exposed to strong and cold winds, then the trees may run from S. E. to N. W., and some hardy sorts be planted for meeting the wind. This direction also allows the sun to penetrate the trees most fully.

The position of the trees being marked upon the ground, we have to prepare for their planting. A circular pit, six feet across, should be dug 18 inches deep, around the spot marked for the tree; and into the bottom of this pit some turf, or similar matter, should be thrown, so as to give a good foundation for the tree.

The young trees, which have been taken up as recently as possible, should have their roots topped back, and then placed in the holes intended for them. The roots must be spread evenly round the tree, and some fine soil thrown amongst them; after which the hole should be nearly filled up with other soil. If the soil is dry, a few bucketsful of water will be serviceable to each tree; and in three or four hours after, complete the treading of the soil and the levelling of the surface.

Deep planting is very objectionable except in rich loams, and even here 18 inches will be quite deep enough. Generally speaking the depth of 12 inches will be sufficient for the trees, and more especially so when the soil becomes less favourable to their growth. The roots being kept near the surface receive greater supplies of heat, and are more healthy and energetic in their growth. For this reason also many trees which are planted on poor soils are planted on the surface, and mounds of soil cast around them. Each tree should be secured by a strong stake, and protected from stock by thorns bound around them. This will be sufficient for sheep, and heavier stock should not graze orchard land.

The earlier pruning of the tree must be such as will favour its development and its right form. This will simply require the shoots from the stem below *the main shoots*, which are the future limbs of the tree, to be pinched off at their extremity about midsummer, and in the following autumn cut off close to the stock. The main branches after they have made the growth of two summers must be cut off about a foot from the top of the stock, and from each of these two or three shoots may be allowed to rise the next season, and these being trained into proper position will soon take the new form given. There are various ways of directing these shoots, for instance by the use of cross-sticks and a cord, or what is better, a frame or hoop. A tree which has been thus trained may afterwards be kept in proper order without much trouble as regards pruning. The tree should be examined *every* winter, damaged and decayed boughs should be cut off, and long and over-grown rambling branches should be headed back. The object should be to keep *the centre* of the tree open so that the sun and air may have access—to get an even and regular distribution of *fruiting wood* throughout the tree—and to avoid over-crowding any part of it. Thus every part of the tree will gain strength, and a vigorous production of fruit will probably result. If this is attended to every winter, the orchard will be kept in its prime for a longer period of time, and produce far more fruit than if the trees are left to themselves.

When the pruning of the tree is neglected the crowded state of the branches prevents the free access of air, and consequently the tree becomes over-grown with moss. After a few years this moss quite rots the outer bark of the tree, and the orchard gets into a thoroughly unproductive state. The best course to be adopted in such a case is to have the orchard well pruned so as to let in the sun and air. The removal of the moss must be accomplished by having the stem and principal branches scraped, and after this these parts should be white-

washed with lime fresh slaked in water and applied whilst warm. This will favour the healing of the bark, and by attention to the pruning its recurrence may be prevented.

When a tree suffers much from canker, the best plan is to head it back to the stock, and regraft it. This in many cases succeeds, but much depends upon the stock; for, if this is disposed to disease, it will spread through the tree even after grafting. Prevention is far better than cure, and especial care should be taken to guard against producing canker by grafting with scions from weak, worn-out trees.

Orchards are also much injured by attacks from the caterpillar of two or three months, which are concealed in the blossom or leaves, and generally known as *blight*. Burning weeds and rubbish, so as to let the smoke pass slowly through the orchard, is the best plan to check them. The woolly aphid (*Aphis lanigera*) is also a very great pest in some orchards. The aphid, in the autumn, lays her eggs; these become partly developed in the spring into females, and the remainder in the autumn into males. They throw out the honey-dew which is so well known in our orchards. No doubt, if the habits of the aphid were better understood, we might destroy it more than at present; now, however, our best procedure is to use lime about the trunks and larger branches.

Orchard-land is generally kept in turf, but is very often cultivated. Upon rich, calcareous soils it is less necessary to break the turf than when the soil is either poor or deficient in lime. Hence, if we observe the *districts* in which it is usual to break the orchards up, we shall find that this is the class of soils. The advantages which result from breaking are, that the soil is kept more permeable to the roots; and the use of manures, by increasing its fertility, adds to the luxuriance of the growth. It is evident, therefore, that any system calculated to impoverish the soil cannot be suited to orchard lands. Our object should rather be, by the growth of green crops, to add vegetable matter to the soil; and, by occasionally breaking the surface, we promote the assimilation of this matter by the fibres of the roots. The use of lime as a manure is an excellent plan, and especially if made into a compost, and then dug into the soil for two or three yards round the stem of the tree. As a *food* for the apple-tree lime is especially valuable, but it is equally so as an *ameliorator of the soil*, in which it frees the alkalies the roots require, and decomposes the vegetable matter which is so valuable for promoting the fruitfulness of orchards. The use of farm-yard manure is most beneficial on poor and close soils, when spread upon the turf, and both ploughed in together, because the soil gets the addition of fertilizing matter together with an admixture of the turf, which will render the soil more open. If the dung were simply spread upon the grass, it would be giving additional strength to the turf; and this is by no means desirable upon these retentive soils. If, on the other hand, we have a *porous soil* to deal with, the firmness of the turf does not interfere prejudicially with the access of the air into the soil.

I know of no system under which orchard-land can be kept in such excellent condition as that adopted in

some of our Kent orchards. Here we have in the centre, between the rows of apple-trees, filberts and black currants planted. This land is regularly cultivated by the fork, and yard-manure is applied occasionally; but the chief dependence is upon frequent stirring of the soil. The trees are kept nicely pruned, and the wood which is allowed to remain is profitable and fruitful. I have seen crops raised under this system worth more than the freehold value of the land producing them. Although this is a system which cannot be carried out in the West with equal profit, still it affords us an example from which we may derive some useful hints. At the least, such a system, compared with the neglected condition of many West of England orchards, shows a contrast as striking as any within the limits of agricultural operations. In the former we have the orchard managed with the care of a garden: scarcely a useless branch to be seen, and the soil clean and free from weeds. In the latter we see trees crowded with dead branches, and covered with moss and blight, presenting the appearance of a forgotten piece of woodland, rather than trees preserved for the production of fruit.

In gathering the fruit from orchards, the first step is to pick up the windfalls; and these are heaped separate from other fruit, because, being unripe, they produce cider of very harsh character. This being done, the gathering of the general crop is commenced. There are one or two points to be borne in mind in gathering the crop, as the quantity of the cider depends upon their being attended to.

The weather should be dry; and the cooler it is the better, provided it does not freeze the fruit. The longer the fruit will hang upon the tree the cooler will the weather be, in all probability. The fruit should be allowed to become as ripe as possible, and, when it reaches this stage of maturity, the sooner the apples are collected the better. Most persons have women picking up the fruit as it falls; others send a man, who, with the aid of a long and rather stiff rod, furnished at the top with a small hook, gently shakes the branches, whilst the women gather up the fruit at once, and either put it in heaps in the orchard, or send them away in carts. In doing this, great care should be taken not to damage the fruit-spurs by the use of heavy and unwieldy poles. The careful cider-maker will have his fruit frequently gathered and removed under cover with as little delay as possible, so as to allow them to hoard and become mellow where they will be safe from the washing rain. He will also be careful in the assortment of his fruit, separating apples of marked difference in colours, and not using them until mellowed.

The yellow apples will generally become ready first, then yellow and red, and, after these, the red; whilst the red and green will be later, and the green the last. Being separated in this manner according to colours, these heaps are again to be noticed as regards their mellowness. It will not, however, do to grind all of one sort alone; for, as I have before said, the keeping character of the cider depends upon the presence of the juice of our harsher varieties. The two former may generally be worked together, viz., the

yellow fruit with the yellow and red, whilst the red and the red and green will go together; but the green should be kept to itself. In this way we gain the advantage of selection by colours, which gives a juice less liable to excessive fermentation, without the disadvantage of a want of power to keep.

I have strictly confined my remarks in this essay to the production of fruit; and I feel convinced that the West of England possesses in the apple a fruit capable of far more profitable growth than has yet been accomplished, and especially by the manufacture of the fruit into cider.

THICK AND THIN SOWING.

SIR,—There is a great horror amongst farmers of thin sowing. If by chance the plant misses, or is eaten, great is the outcry. But how is it we never hear anything of the losses arising from thick sowing? Simply because one is visible, the other invisible. I will venture to assert that for every pound lost by thin sowing there are ten lost from thick sowing.

The money lost this season, owing to thick sowing, amounts in the barley crop to—I might venture to say—tens or hundreds of thousands of pounds. I will point out one instance out of many within my knowledge.

One farmer drilled $2\frac{1}{2}$ bushels per acre on a clay bottom soil, and got an excellent crop, with a good sample, which sold for 40s. per qr. His neighbour, who persisted in his old quantity of 4 bushels per acre, got 3 sacks less per acre, and 13s. less per qr.

I could multiply this case by thousands. The fact is that, with our modern process of drilling and high farming, every seed vegetates and branches considerably. In a season like the past, we get, by thick sowing, a close, dense, top-heavy crop, weak below: no air circulates beneath it: down it goes prematurely, and you have as a result a mass of soft, light, frothy straw, and lean miserable undeveloped kernels. Ten to one but much of your young clovers are destroyed by the want of air and light. This remark applies equally to oats and to wheat.

If a landlord added 5s. to 7s. per acre to his rent, great would be the grumbling; and yet many a farmer throws away with complacency a bushel or two of seed per acre, destroying thereby a large portion of his return. I hear occasionally of absurd quantities of seed sown. So long as I can get 11 quarters of oats from 2 bushels, and 5 to 6 quarters of wheat from 1 bushel, and a good crop of barley from 6 to 7 pecks, I am content to be pitted by the thick sowers.

I do not mean to lay down one general rule for all soils and climates; but I say, try and compare various quantities, which is easily done on a small scale, and arrive at your own conclusions, as I have done. Taking the country generally, I am sure that there is ample room for amendment in this respect.

I think Mr. Caird in his *Times*' reports estimated the yield as 11 for 1: on my farm it is 44 for 1 in oats and wheat. I will always make a polite bow to any farmer who tells me that he has tried, for a series of years, comparative quantities, and has chosen that which paid him best.

I am quite sure we get more weight of straw from moderate than from thick sowing. I remember showing an Oxfordshire farmer a piece of oats dibbled at 1 bushel per acre. He said, "You have much more straw than I have, although I sow 5 bushels per acre." It is curious that farmers, who are so careful about singling out their turnips, should so overcrowd their corn crops. I hope my agricultural friends will excuse this gentle "touch up," especially as I sincerely wish them all many happy and prosperous years.—Yours faithfully,

Tiptree Hall.

J. J. MECHI.

M. DE LAVERGNE'S NOTES OF A JOURNEY OF FOUR DAYS WITH M. DE VOGUE.

TRANSLATED FROM THE FRENCH.

30th May, 1858.—I arrived at Bourges at half-past three o'clock, and set out with M. de Vogué for his factory at Mazières, which is only half an hour's ride from the city. This factory, now one of the most important of Berry, has been entirely established by him on the site of an old domain. Its principal employment consists in making turnplates for railways, of which it can produce one per day, at an average price of 4,000 francs. Two fine hot-air blowing machines, a handsome finishing factory, and forty houses for the workmen, built by M. de Vogué at an expense of 1,700 francs each, and let at a rent of 8 francs per month, with 15 ares of garden, complete the establishment. We examined several of the houses, which are commodious and well furnished.

The ancient domain has become a farm managed by a farming bailiff. It contains 80 hectares of land. M. de Vogué calls it *his menagerie*, because he keeps choice animals at it. I saw there again the Ayrshire Bull, which obtained for him the second prize at the last show at Blois. I also found there the Southdown ram, which had the first prize at the same show: it then belonged to M. de Bouillé. There were handsome cows produced by an Ayr-Berrichon cross. An Ayrshire cow, which obtained the first prize at the Universal Exhibition; fine lambs, of the Southdown-Berrichon cross; and an Alderney cow, which gave abundance of milk, the cream of which appeared to us very yellow and buttery.

31st. May.—After passing the night at the handsome house of the manager of the factory, we set out for another forge at Iroy-le-Pré. We crossed the forest of Saint Palais, which contains 2,000 hectares, a noble forest, which belongs to the State. On leaving it, we visited the ancient abbey of Lorois, which now belongs to M. Lupin. The proprietor was absent, having gone to see the works of an artesian well which he has had sunk at one of his farms. We found his steward, who is a Belgian. He showed us the dairy, composed wholly of Durhams and a Durham-Norman cross. A steam-engine, fixed, works the thrashing machines and other agricultural implements. We crossed some fine fields of wheat and oats, to inspect in a pasture 300 Southdown and crossed Southdown-Berrichon lambs. M. Lupin is probably the largest cultivator in France. He farms himself 1,200 hectares (nearly 3,000 acres), divided into six domains. We saw the ruins of the old church, where were interred the Seigneurs de Sully, and the fine cloisters of the abbey with its columns covered with ivy.

In passing the chapel of Anguillon we visited the half-ruined manor which formerly belonged to Sully. It is one of those unpretending castellanies of the sixteenth century, which, properly speaking, were only turreted farm-houses. Become quite a domain, it has not much changed its appearance. From the high and narrow terrace is a pretty view of the meadows, irrigated by the little Sauldre river.

We arrived at the Foundry of Ivoy, where I recognized one of those ancient forges, established at an unknown epoch, upon a fall of water in the middle of the woods. There are patriarchal families of workmen, who manufacture iron of a superior quality. It serves for artillery, the fabrication of which they overlook. New houses are built for the workmen, as at Mazières. We took a road which M. Vogué has opened,

and which brought us to a high furnace which he has constructed, with all the new improvements. It has a hydraulic wheel of 10 metres diameter, a forge-bellows of great velocity, and a steam boiler heated by gas from the furnace. Other new houses for workmen constitute the whole of the village, with the dwelling of the Registrar, with whom we passed the night.

Near to Ivoy there is a small curious town named Henrichemont. It was the chief town of an independent principality which belonged to the house of Sully, and was united to the Crown in 1769, being about twelve leagues in circumference. Henrichemont was founded by Sully, and named thus after Henry the Fourth. The foundation of the great minister has prospered, for it now reckons more than 3,000 souls.

June 1st.—The industrial part of our journey is finished, and we shall in future only see cultivation. We shall begin with a domain which has been worked for forty years by the same metayer. M. de Vogué accuses him playfully of abusing his position by resisting all kinds of change, because he is sure of not being turned off. He is a good specimen of the old cunning peasantry, dull and obstinate. We saw, however, fine English wheat dressed with guano, and a nice dwelling, quite new, where this metayer is, according to his own expression, lodged like a *ci-devant*. "You see, now," said M. de Vogué to him, "that you were wrong not to hire my domain of me when I offered to let you have it for 1,100 francs." "But, Monsieur le Marquis, I am not at all sorry about it." "How is that? my half now brings me in 2,000 francs." "And mine does the same, but I have not the purse of M. le Marquis." "In fact," said M. de Vogué, "he is right; for I have made many improvements of which he takes the profit." We left this old reasoner, baptizing him "*the agriculturist in spite of himself*."

From Lorois we had still in view the plain of the Sologne, of which we followed the boundary without entering upon it. We touched upon it, however, and found the lands of the domain which we saw, cold and silicious. A little further we found ourselves upon an extensive table land, which three years only ago was covered with heather. Now, that heather is replaced with rye and oats further than the eye could see. The rye extends over 50 hectares, the oats over 90. The road opened by M. de Vogué, for the transport of his minerals, crossed this desert, where the flint appears everywhere upon the surface, and no other dwelling is seen than a station for the carmen. The primitive condition of the soil is still seen upon some scattered points, which bristle with heather and small furze. The rest is one entire mass of green and waving verdure. We are at a loss to conceive by what hands these fine harvests have been raised. With five hectolitres (about 13½ bush.) of charcoal, they sow upon a single ploughing, and the oats spring up to a miracle.

These heaths were formerly burthened with customary rights; the neighbouring proprietors had the privilege of sending on them their flocks. Nothing being possible with such liabilities, M. de Vogué conceived the idea of dividing them; and, by dint of perseverance, he has succeeded in it. Surveyors, nominated by both parties, have amicably remodelled the cantonment. There were some contests for the boundaries; but all is now finished, and each is master of his own land. The

expense of cultivation amounts, for rye, to 175*l.*; clearing, 50*l.*; three harrowings, 15*l.*; five hectolitres of charcoal, 75*l.*; seed, two hectolitres, 30*l.*; for sowing, and mixing the charcoal, average expense 5*l.*; average harvest, 20 hectolitres, 300*l.* The straw is considered as paying the expense of harvesting, cleaning, and thrashing. The net profit should, therefore, be 125*l.*; but the chapter of accidents is such, that in reality it is much reduced. This year, for example, rye being at 9*l.*, the crop scarcely suffices to pay the expenses.

For oats the expenses are diminished by one-third, as they require only two harrowings and 2½ hectolitres of charcoal. M. de Vogué thinks that four consecutive crops may be taken with the same charcoal without impoverishing the soil. These successive crops cost a little less than the first, because the labour is estimated at only 25 fr. I asked him if he intended afterwards to let the land resume the heath, or whether he proposed to establish a domain upon it? He has not yet determined this question, but he is inclined to think that the expense of forming a domain would be too great, and he would prefer converting it into a sheep farm, as is done in Scotland. It is certain that the pasturage is better than formerly. A singular phenomenon occurs; the small sorrel which was rarely seen amongst the heather, springs, on the contrary, on all sides on those lands which have been dressed with charcoal, when they are again left to themselves. What is the cause of this fact, and what conclusion may we draw from it?

We started from Ivoy to go and pass the night at the chateau of Aubigny. We crossed a forest formed by the union of the wood of Ivoy with that of Aubigny. The united properties form a block of more than 3,000 hectares, belonging to M. de Vogué. The history of this estate of Aubigny is remarkable. When King Charles VII. was only sovereign of Bourges, the rest of the kingdom being occupied by the English, a Scotch noble named John Stuart, Earl of Lennox, came to his help with his armed retainers. In acknowledgment, the king gave him the lands of Aubigny, which descended to his posterity. The property having reverted to the Crown in default of male heirs, the King of England, Charles II., as belonging to one of the branches of the House of Stuart, demanded its restoration of Louis XIV., who gave it up to him; but he obtained at the same time a decree, which placed it in the hands of the Duchess of Portland, his mistress, and the natural son whom he had by her, and who then became Duke of Richmond in England, of Lennox in Scotland, and of Aubigny in France. The Dukes of Richmond were, as Dukes of Aubigny, admitted to the French parliament, but as foreigners they were not received.

During the revolution, the estate of Aubigny was seized and put up to sale, but no purchaser presented himself. They could only sell it for 34,000 francs; and out of that sum, one of the two chateaux which belonged to it, and which stood in the village of Aubigny, and was purchased by the Commune, went for 15,000 francs. The second chateau, therefore, which was called the Chateau of the Forest, with the woods and domains, remained as national property, except that the feudal rights were abolished. In 1807, Napoleon caused the lands to be again brought to sale, but still no purchaser could be found. In 1814, the Duke of Richmond who had been *aid-de-camp* to the Duke of Wellington claimed the property. A special article of the treaty of Paris gave it up to him, and he enjoyed it for thirty years, and the peasantry still recognise him as their old master the Englishman. A circumstance not less remarkable than the foregoing, was the cause of his losing it. Collateral heirs raised a question of succession, and maintained that this estate, being situated in France, ought to be subject to the French law of succession, instead of belonging

to the eldest son, as in England. This claim gave rise to a celebrated action at law, which the Duke of Richmond lost.

It was then that the estate was put up for sale, and purchased by Messrs. Chevreux and Legentil, who have re-sold it to M. de Vogué. In cutting down a large part of the old forest trees which had begun to decay, he has preserved those which might contribute to the beauty of the landscape. These vast woods shelter many wild animals. In a single battue they have taken in it a dozen wolves. We reached the chateau at sunset. Its towers rise in the midst of the forest, and on the border of a large moat, and is a perfect specimen of the middle ages. We should call it the *Chateau of the Sleeping Beauty in the Woods*. We entered by a fortified gate into a court-yard covered with grass. A winding stone staircase in one of the towers led us to the interior, where we found vast apartments, scarcely altered for adaptation to modern residence. A long gallery, which occupies one of the wings, is covered with paintings in fresco, half effaced, which should belong to the fifteenth century, and represent the ancestors of Aubigny of the House of Stuart, some on foot, others mounted on war horses. This gallery is temporarily occupied with the extraordinary crops produced by the clearings.

2nd June.—At break of day I opened my window, which looked out upon the moat. This feudal feature, which has not been altered since the days of Charles VII. (1422), gives the idea of incomparable calmness and solitude. The same sun still rises behind those venerable trees whose roots are bathed by the same waters of the moat.

The estate of Aubigny has, besides the wood, a dozen domains. We visited several of them, and met everywhere metayers who still talk like the peasants of Molère: "*J'allons, j'idions, j'avons ben besoin d'eau pour les arènes; bon jour, rot' maître; comment se porte rot' maitresse?*" Not only the language, but the costume of the past is retained. A young shepherdess wears a hooded woollen neck-handkerchief, as we see them in the ancient paintings; indeed, the coat of arms of Bourges are supported by the *pastourelle* (the shepherdess). Fortunately, if the shepherdesses have not changed, the flocks have been improved. Most of these are of the pure Solognote breed, but strengthened by a better treatment. These poor animals are very warm under their fleeces, the custom of the country being not to shear them till Saint John's day. We found everywhere new homesteads, reconstructed dwellings, courts levelled, enormous heaps of marl extracted from the depths of the soil, and fine crops coming forward. In the domain that adjoins the chateau, and which is farmed by M. de Vogué, we saw a magnificent field of lucern, handsome crossbreeds of oxen and sheep, and even attempts at pisciculture. O naiad of the Nère—of that river which, according to the ancient historian of Berry, was "*sown with trout and paved with crawfish*—" what would you say to this?

The fields here are surrounded with enormous hedges, called "*bouchures*,"* formed of large trees, the branches of which are bent to the ground, in order to interlace them with each other. These hedges must be a great hindrance to the cultivation, on account of the invulnerable pollards which grow up from them, whose deformed trunks effectually shut out the light and air. The roads, cut up by the carriage-wheels, wind under these thickets, which preserve the humidity in winter, and render the road impassable. The air is impregnated with unhealthy exhalations, and hurtful animals of all kinds find refuge there. The whole has a wild and forest-like aspect. We must not forget that this country is one of the most thinly-peopled parts of France: the *arrondissement* (district)

* A technical term, only local, and untranslatable.

of Saucerre, in which we are, has not quite forty inhabitants per 100 hectares. There are only the *Landes*, the *Lozère*, and the Alps which have less.

We set out from Aubigny, to visit another property, called "*Boucard*." We saw again, in passing, other heaths, treated, like that of Ivoy, with charcoal. At this time, M. de Vogué has the intention of establishing an entirely new domain; or, at least, of annexing these cleared heaths to an existing domain. He has selected for this purpose what they call here a *manœuvrierie* (local)—that is to say, one of those small domains elsewhere termed *locatures*, *borderages*, or *closeries*, which are originally only dwellings almost without land, let to workmen on condition of a certain number of days' labour. This *manœuvrierie* will become, by the annexation of the heaths, an important domain, and they are in course of adding to it new buildings. But what drew our attention more than these structures was, a provisional grange erected in the midst of those ancient heaths, with some beams, brooms, and branches, to thrash there the corn collected upon the clearings. M. de Vogué calls it his squatter's house, and he has fixed there a Pinet machine, which works with three horses and thrashes 40 hectolitres per day. All around is a desert, and one might fancy oneself really in America.

Until now we have remained in the canton of La Chapelle d'Anguillon, very near the *Sologne*, and one of the most barren in the department. We climbed a hill which separated us from the valley of the *Sauldre*, when appeared before us another horizon, that of the canton of *Vailly*, one of the most fertile and best cultivated. To the siliceous succeeded the argillo-calcareous soil. The summits are still crowned with woods, but the slopes and bottoms are covered with cultivation. The estate of *Boucard*, which M. de Vogué owns in this valley, was left him by his grandfather, M. de Langeron. The arable land is divided into twenty domains, of which half are let out.

Whilst the lands of Ivoy and Aubigny have great difficulty to realize 15 francs per hectare of net profit, in spite of the efforts of the proprietor, here we find them let at 30 and even 40 francs per hectare, so superior is the nature of the soil. Twenty years ago the whole of this country was without means of communication: M. de Vogué has largely contributed towards the opening of roads—one entirely at his own expense, and of others he has paid a part of the outlay.

We passed on to *Jars*, an ancient castellany, erected into a farm in 1760 by M. de Langeron. This fief belonged formerly to the *Rochechourart* family, and has given its name to one of its branches. One of its possessors, the *Chevalier de Jars*, an intelligent, amiable, and brave man, was one of the adversaries of *Richelieu*. After having passed eleven months in the *Bastille*, he was condemned to death, and went to execution, but was relieved on the scaffold. An exile successively in England and Italy, he returned into France only after the death of the Cardinal, where he again played a part in the *Fronde*. Less than 100 years after his death his fief became a farm. It is true that the magnificent chateau built by *Richelieu* has not lasted much longer: cultivation alone survives every-thing.

We arrived towards evening at *Boucard*. Here is another chateau: inhabited for more than 100 years past, it has remained such as it was at the commencement of the eighteenth century. It is here that the *Duchess of Navailles*, to whom it belonged, was exiled by *Louis XIV.* for having caused the windows of the *Maids of Honour* of

the *Queen* to be grated. The poor lady had time to reflect there on the danger of misplaced severity.

We dined in the gallery of the chateau, ornamented throughout with very large pictures of hunting, copies after the original of *Oudry*, which are, I think, at *Fontainebleau*. These pictures are admirable, of a species adapted to France, and the best possible decoration for the chateau. A portrait of the *Duke of Navailles*, in the costume of a *Marshal of France*, ornaments the chimney, from whence he looked down upon us with an air of sufficiently bad humour. At his feet is written the following inscription, half effaced:

C'est ici que cherche le sage
Liberté sans libertinage,
Doux repos sans oisiveté,
Et qu'afranchi de l'esclavage
Il trouve la félicité.*

What slavery does he refer to? Is it that of a court life? Must we see in these verses an allusion to the exile of *Madame de Navailles*? Be this as it may, if the verses are poor the sentiment is good. M. de Langeron, who had succeeded the *Navailles*, occupied himself with the management of his estate; he had his accounts, accompanied with annotations, bound in red morocco, gilt edged; these volumes must contain curious details on the rural economy of that age.

They lodged me in the same room of the *Duchess of Navailles*, the furniture and wainscoting of which are all of that period. The bed of the *Duchess*, as wide as it is long; the arm chairs with armorial bearings; the walls, hung with old tapestries, representing the history of *Joseph*; the high chimneypieces, the large fire-dogs, the remembrance of that noble victim of duty—all these presented more than was required to excite and occupy the imagination. It seemed to me that I saw her there, seated in one of those great arm chairs, with costume and looks equally severe.

3rd June.—I have occupied as small a space as I was able in the immense bed, in which six persons might sleep at their ease, and have had no uneasy dreams. I passed my morning in a walk round the chateau; the ditches are half filled up; but they are about to take away the mud which fills them, to throw it as manure upon the lands. The old wych elms are no longer cut in shapes—the garden no longer cultivated. We see only, near the flight of steps, a few *Provence roses* and forgotten *peonies*, which flower again every spring. On the exterior walls of the chateau are engraved on all sides these two inscriptions, which were doubtless the devices of the ancient seigneurs de *Boucard*—"*Victrix patientia fuit*," and "*Sat cito si sat bene*."† The old manor has need enough of the reminiscence, but I fear much that its destiny will well prove stronger than its patience.

This property was formerly managed by farmers-general, an institution convenient enough for the proprietors, but very unprofitable for husbandry. M. de Vogué, who has undertaken the defence of this kind of farmers, in his letter to *General Canrobert* in 1852, has, nevertheless, suppressed them himself in order to assume the direction. Besides the farmed domains, he still occupies round *Boucard* 600 hectares on the metayer system. We have visited many of these metairies, and found within all the signs of improvement evident. *Sainfoin* covers the soil everywhere with its

* Here the wise man seeks liberty without libertinism, sweet repose without idleness; and freed from slavery, he finds happiness.

† "She conquers who bears fate patiently," and "Quick enough, if happy enough."

rose-coloured carpet; everywhere they begin to grow beet-root and lucern. Large purchases of guano admit of manuring better, without diminishing the corn crops. They usually manure in the country at the rate of 20 cubic metres to the hectare, but M. de Vogué puts on 30 and even 40 metres. But what struck me still more in the improvements was the air of confidence in these metayers; all hasten around him as soon as he arrives; all come to talk of their affairs and their children; and the old grandmother, who can scarcely hobble, brings him her grandchildren.

There is certainly much to be said against the metayer system; but this when understood and practised, is the best the situation of the country will admit. It is not the fault of the present possessors that the country is without capital; they are obliged to accept it such as it is, and when we cannot have good farmers everywhere, who advance money themselves, metayers are better than farm servants. Everybody gains by it—the metayer first, who is in a situation more elevated than a simple stipendiary, and profits on his part by expenditure he could not himself incur; the proprietor afterwards, who finds in this connection the guarantee he has need of in engaging in costly efforts. I have in no place seen this invaluable harmony between labour and capital more sensibly than here.

We close this interesting tour at a farm worked by a son of one of the ancient farmers-general. Fifteen hectares of beet-root, yielding an average of 40,000 kilogrammes; fifteen hectares of fine lucern, and 40 hectares of wheat; an apparatus for cooking the beet-roots to mix them with hay and cut-

straw, and ferment them before giving them to the animals; 80 head of Durham Charolaise cattle, with a handsome bull—such was the farewell bouquet of our journey. Unfortunately all these animals are now very poor, because fodder has failed; but the young farmer has taken his measures that they shall no longer want.

We ought to have finished at Piseau, the summer residence of M. de Vogué, situate on the bank of the Loire, in front of the town of Cosne; but time presses, and I cannot go there. The lands attached to it are let to farmers in the environs of Paris, who make of it a profitable occupation. Thus is completed the series of combinations that may be applied to the cultivation of the soil. On certain points metayers, on others farming by labourers, on others farmers of distant origin, on others native farmers. M. de Vogué employs all these means at once, according to circumstances; he reunites, in fact, all the conditions of agriculture, from the lands of the banks of the Loire, which are worth 5,000 francs per hectare, to the heaths of the Sologne, which were not worth 200 francs before the clearings.

Such, then, is this large property, viewed under its most favourable circumstances. I do not believe that any large English proprietor fulfils more punctually the duties of his station; no one better than M. de Vogué could take his repose in an elegant leisure, but he has preferred to consecrate his life to a useful work. He overlooks and directs all himself, without in the meantime withdrawing himself from the world.

LEONCE DE LAVERGNE,
Member of the Institute, and of the
Central Société of Agriculture.

THE PRESENT CONDITION OF AMERICAN AGRICULTURE.

Standing, at this time, midway between two harvests, we are afforded the opportunity to glance retrospectively at the results of the past season, and anticipate to some extent the coming one. It is not my purpose, in these letters, to notice the fluctuations in the prices of corn, and to daguerrotype the conditions of our markets; but rather to give, in epitome, a general view of our agricultural progress, and bring to the notice of your readers any valuable discoveries which may tend to assist the labour of the husbandman. The intimate relations which bind our two countries together, and which make the prosperity or adversity of one a subject of weal or woe to the other, are surely sufficient inducements for me to write and you to read of our advancement; and it would be strange indeed if, in a series of letters, some valuable facts were not elicited. It is only the rabid partizan who assumes all excellence to be concentrated in his own land; the more just, intelligent, and conservative know that whilst America is far behind England in a perfected system of agriculture, and, to improve her breeds of cattle and the productiveness of her exhausted lands, must import the means and knowledge from her "mother isle," there have still been made in this vigorous nation wonderful strides in the production of labour-saving tools, many of which it would be well worth your while to adopt, and some of which you have adopted already.

What would especially facilitate this desirable interchange, would be for your intelligent farmers and our

own to exchange visits; to attend each other's agricultural shows; to sit at each other's banquets; and to go to each other's farms. In this way we would get to know each other's worth. But as this can only be to a very limited extent, it must be left to such as have seen both countries to give, through such media as your columns, the results of their observations.

An Englishman visiting this country is at once struck with the rugged and uncultivated appearance of our farming districts. In some States are to be seen on every farm the stumps of old forest trees thickly studding the ground, interfering with the progress of the plough, and marring the beauty of the fields. In others, boulders and outcropping rocks are equally noticeable. Here he will see a great stretch of country as hilly and unproductive looking as the mountain districts of Scotland; and there lie thousands of acres of swamp lands and morass, which in England would be thorough-drained, and producing heavy crops of corn. But throughout the great region of the West, how different the appearance of things! In midsummer the traveller rides for whole days together over rich prairie lands covered with the most luxuriant crops of Indian corn, wheat, and grass, presenting, as far as the eye can reach, swaying billows of verdure. When it is considered that the territory of the United States extends over three million of square miles, that their population is so small compared with that of Great Britain, and that every de-

scription of manual labour bears an enormous price, it will be readily understood that there are but slight inducements for our farmers' sons to waste their lives in striving to redeem the homestead farms which have been impoverished by their ancestry, when, within a few hundreds of miles, there are lying untilled millions of acres as fertile as any which you possess in Kent or Suffolk. This state of things has developed two characteristics in Americans, viz., a very feeble attachment to localities, and a wonderful growth of the inventive faculties. Do they wish to raise better crops? instead of duplicating the patient experiments of Mr. Alderman Mechi or Mr. Lawes, they sell their ancestral acres for whatever they will bring, and with the proceeds purchase larger and more fertile farms in the West. Do they find it impossible to hire labourers to gather their teeming harvests, except at unreasonable prices? they get some friend to invent labour-saving tools that for a moderate price will perform the work of twenty or forty men. And thus, whilst it must be candidly acknowledged by every American that our systems of farming, as compared with your own, are shiftless and crude, our annual aggregate of product continually augments, because new territory is each year put under cultivation.

If, however, we do not follow the examples you set us, we are kept informed as to what you are doing. We are a reading people, and by means of our agricultural press are made acquainted with the sayings of Professor Voelcker, and Mr. Johnson, and the doings of the Marquis of Tweeddale, and Mr. Booth of Warlaby. The *Mark Lane Express* is as well known, and many of its best articles are as well read here as they are at home.

I found that there was a general impression prevalent in Great Britain that our cotton crop was by far the most valuable to the country; and I do not remember to have met with a person who realized the national importance of our Indian corn. In the last report of our Patent Office, the statistics show that Indian corn ranks as the most valuable of our crops, the annual yield being 600,000,000 bushels, and its value £60,000,000. The wheat crop is valued at £20,000,000; and cotton comes next in order. Our hay is worth only £400,000 less than the cotton crop.

The average value of Indian corn to the farmer who is near any considerable market is 2s. per bushel, or one-half that price if unshelled and sold "in the ear," as it is termed. Where the producer is at some distance from market, this small price will not warrant his paying the railway charges on the grain; and it is consequently more profitable for him to feed his corn to hogs, and sell them alive to the agents of the great slaughtering establishments which abound in our western cities. On our higher-priced lands in the old states it is more profitable to raise crops which give a greater profit in a small bulk. And, especially is this the case in the slave states, where the high price of labourers and the cost of their maintenance, added to the expense of maintaining their non-working masters, require the cultivation of such crops as cotton, tobacco, and sugar to obtain a profit.

The spring of the past year was in many parts of the

country disastrous to winter wheat, and throughout the West the rains continued so long, and the ground became so sodden with wet, that it was impossible to procure a good start of Indian corn until too late to give a perfect ripening and full crop. Even as many as three and four plantings of seed were made in some instances, before a set could be got. Wheat sotted in the ground, or else was attacked by rust, and spring grain even suffered from the same causes. The venerable Secretary of the New York State Agricultural Society gives me the following reliable statistics of the wheat crop of 1858, and the prospect for the current year.

New York	....	{ About 15 per cent. under that of 1857 in quantity, but superior in quality.
Pennsylvania	..	{ An average crop.
Maryland	.....	{ An average crop, and excellent quality.
Virginia	.....	{ 20 per cent. less than last year, owing to the wet spring, summer drought, and attacks of insects.
North Carolina	..	{ About one-half a crop.
Kentucky	....	{ Average.
Tennessee	....	{ Good.
Missouri	.....	{ About two-thirds crop.
Ohio	.....	{ 20 per cent. less, but more laud in cultivation.
Illinois	.....	{ Southern part an average, central only one-third.
Indiana	.....	{ One-half to two-thirds.
Michigan	.....	{ Two-thirds, quality excellent.

Taking the whole country into consideration, the aggregate wheat crop is about three-fourths of an average crop per acre: but from there having been much more territory under cultivation, the yield is only about one-fourth less than that of 1857. Throughout the West the streams were greatly swollen by the long-continued rains, and many thousands of acres of crops were entirely swept away.

	Estimated product for	
	1858.	1859.
	Bush.	Bush.
New York	..... 22,000,000	.... 20,000,000
Pennsylvania	.... 20,000,000	.... 20,000,000
Virginia	..... 20,000,000	.... 18,500,000
Kentucky	..... 10,000,000	.... 8,500,000
Ohio	..... 25,000,000	.... 22,000,000
Indiana	..... 15,000,000	.... 13,000,000
Illinois	..... 18,000,000	.... 14,500,000
Other States	.... 50,000,000	.... 42,000,000
Total	.... 180,000,000	.... 158,500,000

The hay crop has been fair. Potatoes about an average crop; but the whole family of cereals may be fairly reckoned the same as wheat.

We have welcomed with open arms a new plant, which in your columns has for its only champion "The English farmer in Belgium." I refer to the *sorgho*, or Chinese sugar-cane, introduced here in 1854, and with only some half-dozen acres in cultivation in 1855, it has run throughout our territory as electricity through iron, until it is estimated, with every appearance of probability, that there have been over 100,000 acres in cultivation the past season, and this enormous area is likely to be doubled in the coming spring. It has been found to flourish in every one of our States, and has in turn yielded crops of excellent forage, syrup, and in some cases of sugar and other products. A well-known sugar refiner of Philadelphia, Mr. Lovering, has made from

its juice every grade of sugars, from common Muscovado to best loaf; and Mr. Jno. W. Reid, of New York, and others, have produced excellent brandies and other spirits, by simple processes of distillation. The last spring a new series of varieties of the same plant were introduced by an Englishman, Mr. Leonard Wray, who discovered them in Caffraria some years since. He gives to his plants their Caffrarian name of *imphée*, or *im-fé*, and to each one of the varieties its specific name, such as *En-ya-ma*, *E-en-gha*, *Vim-bis-chu-a-pa*, &c. These new varieties have been cultivated to a limited extent, and with varying success. I have a good sample of sugar made from them as far north as Illinois, for which I am indebted to the secretary of the agricultural society of that state. Mr. Francis believes that the north-western states will ultimately produce all the sugars needed for their home consumption; and in this opinion many careful men coincide. There can be no doubt but that this cane will have an influence upon the plantations of the tropics; but it will never be felt until the best processes of manufacture are fully developed, and large capital has been invested. And this will not be brought about for years. In your climate the new cane can never succeed, for the simple reason that it will not mature. It flourishes best on clay loams, and requires several weeks of hot weather and unclouded sun to develop the full saccharine richness of its juice. As a forage crop it may prove a source of profit to you. As much as ten tons of dried forage have been taken from a single acre; but I very much doubt if you would be able to dry it sufficiently for stacking. If used at all, it will probably be fed out as a green crop when the stalks have attained a height of say three feet.

The causes mentioned in another place have militated against the prosecution of a regular system of under-draining in this country. Almost every farmer in this country is the owner of the farm he occupies, but it is a very rare exception to find a person having much capital invested in his operations. The outlay requisite for even a small beginning of drainage is not within his power to make, and hence it is that what with this, and his scepticism as to the profit of tile drains, there are many thousands of acres—yes, millions of them—so wet as to yield only fractions of crops; and the whole amount of tile annually laid has not exceeded two millions of feet.

The most illustrious example we have of the benefits of thorough drainage is the farm of Mr. John Johnston, near Geneva, in this state. Mr. Johnston is an intelligent Scotchman, who commenced his operations nineteen years ago, and has steadily pursued them to this day, despite the scepticism and ridicule of neighbours and friends. Up to 1855 he had laid 210,000 tiles, or over forty-seven miles; and the result is that when, some years since, on the farms of six adjoining neighbours the midge had so destroyed the wheat that the average yield was not above seven bushels per acre, his own gave three quarters and five bushels. A new impetus will, however, be given to tile drainage by the very successful operations on the Central Park at this city. This work is under the direction of Mr. George E. Waring, jun.,

agricultural engineer, who follows the system suggested by the experience of the best English engineers. The soil being generally clay loam, the drains are laid out at distances of forty feet from each other, running down the line of the steepest descent of the land. Grade stakes are set at the intersections of the drains, and at various points along the lines. The levels of the tops of these stakes are then taken, with reference to an arbitrary horizon which is the same for the whole system of drains. From these levels is calculated the depth of the drain at each stake, the same being in accordance with the following principles, viz.: No drain is to have a fall of less than 1 in 200; no drain to run with decreasing fall as it approaches its outlet, when it is possible to avoid it; and small drains to deliver into the tops of the larger tile of the main drains. When it is necessary from the undulation of the surface to lessen the fall of the drain as it approaches its outlet, a small brick basin, or a large tile set on end, receives the flow, lessens its velocity, and retains its silt, allowing only clean water to pass out through the drain. The drains are, when practicable, placed at a depth of from 4 to 5 feet from the surface, and the drains of each tract of twenty acres are collected in a "silt basin," having a capacity below the outlet of about three cubic feet for the reception of silt. These silt basins are continued to the surface of the ground, and are covered by locked cast-iron covers, on opening which the silt may be removed, or the operation of the drains watched. Exact plans of each system, and records of the depths, and sizes of the tile, are kept; so that future alterations and additions may at any time be made. The whole system is a very complete one, and its results have been unexpectedly beneficial. The magnitude of this work, and its accessibility, will assuredly bring tile drainage into much greater favour; and when the cost of tile can be lessened, its use will be much more general. At present $1\frac{1}{2}$ inch round tile, with collars, costs 14 dollars, or 58s., per thousand; and an acre can not be properly drained for less than about 1s. 4d. per rod.

The demand for a steam plough has been severely felt in our western states, and large inducements have been held out to inventors. The Illinois State Agricultural Society offered this year a prize of five thousand dollars (£1,000) for an engine capable of ploughing, drawing loads on common roads, and furnishing motive power for the various farm operations as required. At the Society's show at Centralia, one competitor entered the yard mounted on his "fiery chariot," and competed for the prize. The jury in their official report state that the machine "is well adapted as a stationary engine for farm purposes, and that with improvements it can be made useful for ploughing on our prairies; but that it is not as yet such a machine as will entitle it to the premium offered by the society." They, however, awarded J. W. Fawkes, the inventor, the sum of £100. On the day following the trial, a public exhibition was made of its powers, and the secretary of the society assures me with better success. The inventor claims the application of power to a single drum or propelling wheel, which has a diameter and width each of six feet. The front part of

the frame rests on two guiding wheels three-and-a-half feet diameter, and sixteen inches wide on the tire, which prevents their miring in soft ground. There are adjustable spuds in the periphery of the large drum to prevent it slipping. He guides his machine in a manner something similar to Boydell. It draws a gang of six ploughs, each turning a twelve-inch furrow. These are attached to a frame, which, by means of chains and a windlass, is hoisted and lowered by the engine when it is required to turn at the ends of furrows. The turning is done in three-sevenths of a minute. It is worked by two men, an engineer and a fireman, consumes but little fuel and water, and pumps the water into the boiler when either stationary or in motion. Its regular rate of travel when at work is three miles per hour; and it can be made to start, stop, back, and turn to either side, by a gentle touch of the operator. It is claimed that it will plough twenty acres of sod per diem, at a cost of 2s. per acre. This one of twenty horse-power (American computation) costs £500. Although this is evidently not a complete success, yet from certificates from respectable engineers and farmers which I have seen, I make no doubt but that it warrants us in expecting much from its future performances. There can be no question but that we shall ultimately see steam applied to the harvesting of our corn and grass crops as well as to ploughing; and I rejoice to see the earnest competition which is going on between English and American mechanics to bring about these desirable results.

To give you some idea of the number of agricultural implements annually produced in this country, I may mention that the great house of Nourse, Mason, and Co., of Boston, manufactured and sold last year *fifty-one thousand ploughs*; and a firm in Illinois built four thousand two hundred reaping machines, which is, doubtless, twice or three times as many as have been made by all your makers since they were first introduced by Mr. Bell. The royalty paid by this firm to the widow of the patentee at £5 on each reaper is the snug sum of £21,000, which for one year's income of a once poor mechanic is not so bad.

Hand in hand with the magical progress of your Australian colonies, has marched our California; and at the present day its agriculture exhibits a remarkable evidence of prosperity. It may not be uninteresting to look back for a moment upon its past history. In 1769 and '70 the first settlements were made in Upper California (at San Diego and Monterey), by the Mexicans. Without improvement of its agriculture, with no commerce or manufactures, the country remained under their listless sway for eighty years, until by the treaty of Guadalupe Hidalgo, it was annexed to the United States. The tide of empire then set toward its shores, and like some dream of Oriental fables, it has grown into magnificent proportions. In 1856 there were produced 367,154 qrs. of wheat, 403,653 qrs. barley, 45,554 qrs. oats, 20,683 qrs. Indian corn, 721,018 bushels potatoes, 258,982 lbs. wool, 452,173 lbs. butter, 246,113 lbs. cheese. There were 81,703 horses, 17,713 mules, 520,276 head of cattle, 192,271 sheep, 138,910 swine. Of fruit trees there were 1,071,713, of

grape vines 1,317,957. Her crops of wheat average more to the acre than the best wheat-growing districts of the older states. The climate and soil are capable of producing the vine, olive, fig-tree, orange, lemon, pomegranate, the cork-tree, prune, date, tamarind; and beside these the quassia, Egyptian senna, rice, tobacco, cotton, mulberry, madder, and multitudes of other precious articles of commerce. Of the future of California it is impossible to judge; but if it does not belie the promise of the present, it must become a wonderful empire.

Of agricultural societies under state or county organization we have nearly eight hundred, and their influence is in general of a salutary nature. This same want of individual capital amongst the farmers prevents the accumulation of funds by donation, and as the society must in great measure depend upon its receipts at the gates to pay its expenses, care is taken to make such displays as will draw a large concourse of spectators. Hence it is that you may notice in your American agricultural exchanges, frequent criticisms upon the greater attention being paid to horse-trotting on the trial track, at the expense of a thorough examination of the cattle or implement on the ground; or of the officers of certain societies lending encouragement to exciting displays, which would scarcely come within the province of a purely agricultural association. But with all our imperfections, there is very much to challenge the approbation of sensible men, and what is bad will right itself in due course of time. At the meeting of the United States Agricultural Society, held at Philadelphia in 1856, there were in one day over seventy-five thousand persons on the grounds, and wherever the show has been held the concourse has been vast. At Louisville, in '57, there were hereforas on exhibition, which had been brought some six hundred miles by railway; and this year at Richmond, Va, there were animals, implements, and products from equally great distances. The number of entries of all kinds was not so great as at some former meeting, but the herds are spoken of as being of excellent quality. The number of entries were—of cattle 110, horses 191, sheep (pens) 51, swine (pens) 24; and the amount of premiums offered about £1,600, exclusive of gold, silver, and bronze medals, and diplomas, for implements and manufactures. The annual business meetings are held in the City of Washington, in January, when valuable papers are read, and interesting discussions held upon agricultural topics. The present government of the Society are using every endeavour to increase its influence and utility, and with a fair share of public assistance there can be no doubt of a favourable issue.

The greatest interest is felt by our fruit growers in the labours of the American Pomological Society, which in September last made its tenth annual display. The wide diversity of our climates enables us to produce the fruit of every part of the world, and the task of testing the merits of the multitudinous varieties of our commonly cultivated fruits, of unravelling the confusion of names, and distributing the most suitable fruits to each section of country, is no slight one. The good already accomplished by this society is almost incalculable, and

the zeal of its working members seems to suffer no abatement.

There was introduced into the House of Representatives, during the last session of Congress, a bill by Hon. Mr. Morrill, providing for donations of over six millions of acres of the public lands, to the several States, to provide colleges for the benefit of agriculture and the mechanic arts. It is proposed to distribute the land on the basis of Congressional representation, allowing 20,000 acres for each Senator and Representative in Congress. This will give New York 700,000 acres; Pennsylvania, 540,000; Ohio, 460,000; Virginia, 300,000; Massachusetts, 260,000; and to the other States in proportion. The proceeds of these lands are required to be invested by the various States in safe stocks, yielding not less than 5 per cent. interest, the capital to remain undiminished—a perpetual fund. The interest is to be applied to the internal economy of a college for the teaching of agriculture and the mechanical arts, and in no case to the erection of buildings. Any State not providing such a college within five years from the passage of the bill, forfeits its claim to its benefits.

The bill was passed by a vote of 105 to 100, in the House of Representatives, but no decisive action has as yet been taken by the senate. It will, however, in all probability be made the subject of special legislation during the present session. It has met with great favour from our press and the public, but I cannot but think it is somewhat premature, for if each State were to erect the required college, it would be a matter of impossibility for us to find teachers and professors competent to fill the several chairs, without importation from abroad. The better plan would perhaps be to found a national agricultural normal school, as complete in appointments and as thorough in course of study and practice as our existing naval and military academies. In such an institution a corps of teachers could be educated; and when once this were done, the several colleges might be endowed and erected.

In my next communication I hope to give you a sketch of the agricultural colleges already founded in this country, and some further notice of the more valuable discoveries and inventions.

New York, January 1st.

H. S. O.

HINTS TO EMIGRANT FARMERS.

Uncle Sam, it is currently declared, has farms for all the husbandmen "in creation"—a fact which his immense territory, not to speak of what, through "inevitable destiny," he is bound to annex, will almost sanction. But Uncle Sam, like his progenitor, John Bull, has peculiarities of soil and circumstances which commend or condemn his real estate, and to some of both, with your leave, will I attempt to draw the attention of the agricultural readers of the *Express*, and especially such of them as may contemplate emigrating here. I write only of what I have seen and know in both the eastern and north-western sections of this country—the only two in which Scotch farmers, judiciously advised, can have any interest in choosing a settlement.

New England farming is literally up-hill work—hard and unremunerative. The soil is generally poor, stony, and sterile, with the exception of the river bottoms, where it is one-third meadow, to two thirds quagmire, with but few exceptions—among them the valley of the Connecticut. When natural circumstances favour, money may be made; but, generally speaking, the New England farmers are hard working, poor men. I might add, also, that they are generally poor farmers, and blind in particular to the organic fact that "muck's the mither o' the meal kist." As it may be of some little interest to your readers to have an intimate description of the process of farming here, I will take the liberty to give one, premising that my data are drawn from facts connected with a farm in which I had some pecuniary interest; and, of course, their accuracy may not be questioned.

The farm alluded to was, seventy years ago, covered by a dense forest of pine trees, which were hewn down by one of the revolutionary heroes who had emptied his old "Queen Anne" in the faces of the red coats from the top of Bunker's Hill, followed Washington for a short time, and retired with his honours—in the shape of sundry deeply indented scars—to enjoy his *otium cum dignitate*, when he had hewn, hacked, and hoed it out of the realm of old Mother Nature. The farm, six

years ago, when I became interested in it (and it is similar now), consisted of 64½ acres. Of this surface, six acres are covered with tall spruce, hemlock, beech, oak, and birch timber. There are two acres of orchard ground, all apples. Of arable land there are 26 acres, one-half of which may be called good—including the house and barn lot, and the garden. A meadow, which produces a considerable crop of the aquatic grasses, monopolises 4 acres; and the rest is pasture land, which means land where the trees have been felled, and which is three-fourths covered with scrub oaks and small bushes. This description will hold good as to the average of inland farms of the same size. It is situated 30 miles from the nearest railroad, and 40 miles from any considerable market. The value of this farm is now about £500.

The stock kept on the farm comprises four working oxen, one yoke or pair, five years old, and the other four years. Other oxen or steers are variously kept, but at present there is one yoke of three year-olds, three two year-old animals, and four calves. There are four milk cows, three heifers rising three years old, four two-year-old do., and five heifer calves. One horse, seldom used for farm work, and thirty sheep and lambs, fill up the list. The value of the stock will range in the vicinity of £150, which sum will include the value of three hogs kept on the farm. Add £100 for farm implements and odds and ends, and as much for the fodder necessary to sustain the stock throughout the winter season (for in summer it shifts for itself), and the total value of farm and contingencies—house furniture calculated into the amount—will be less than £1,000. And it must be recollected that this is the price of what is here called a *good farm*. Throw a light four-wheeled waggon into the list of necessaries, and £1,000 will cover all the expense.

And now let us speak of the produce. The heaviest yoke of cattle will bring about £30; a couple of cows £12; a dozen of lambs £7; a fat hog—say 500 lbs.—£6; hens, chickens, and turkeys, 3 dols.; butter (what can be spared from family

use), £6; beans, £4; wool, £10; potatoes, £2; and hay, £10. I put a low figure on the last two items, as it is generally the rule to keep as much stock on the farm as will use its produce in these articles, and also all the carrots and turnips raised, of which there are very few—say £100—and you will have the full value of what can be spared from the farm for market during the season. Keeping contingencies in view, but little further inroad could be made in the stock than that stated—but the sum immediately above specified will include that extension up to its reasonable limit. Deducting the expenses of tear and wear of implements, repairs on houses, taxes, &c., a diligent farmer will be well off if he can make 4 per cent. of interest on his investment. But then the farm and its produce are his own, and the improvements are also his own; and knowing this, he can hold his head much higher than he could do at home, at court day, with a lank purse, and an exacting or a needy landlord. That fact itself is worthy the sacrifice of a good per-centage. However, there are circumstances under which the emigrant farmer could do much better, as I will subsequently show. In fact I may as well state at this point, that I would not advise a Scotch farmer to settle himself in New England, as he never could mould himself to the circumstances which would surround him in various shapes, some of which will be readily inferred from what follows.

Of the 26 acres of arable land spoken of, four are, on the average of years, planted with Indian corn or maize; two with potatoes; one with beans—which are not of the description you raise in Scotland, but a kind used for food, and, out of Mexico, principally used in New England; one acre with wheat, and one with oats, which grow here miserably, and never produce a paying crop under any circumstances; an acre of buck wheat, and as much for kitchen garden purposes, and the growth of carrots and turnips closes up the list. This will occupy ten acres of the lot. The remainder is devoted to the produce of clover and ryegrass hay—in proportion to the breadth of cereals of the previous year, and the natural grasses, all of which come under the denomination of hay. The farm I speak of produces about 40 tons per annum—about a sixth part only of the whole being good. The Indian corn land will not yield more than 100 bushels from the four acres. Potatoes will produce about half the quantity the same breadth of land will yield under the Scottish system of cultivation; wheat is always a precarious crop, and seldom does well; and oats and turnips are miserably poor. Carrots grow well, and also beets. Pumpkins are planted among the corn, and grow excellently, furnishing capital living for pigs. Cabbages produce liberal crops, and garden stuffs are always plentiful. Some farmers grow vast quantities of apples, which are cut and dried for family use, made into cider, or sold at market. But these items, like eggs, are the guidwives' perquisites, and must be sacredly considered so.

The hay and grain being now secured (the latter end of September), ploughing has commenced. Imagine a sturdy fellow, with a long goad, shunting and pricking half-a-dozen sturdy oxen, who are dragging a stump of a plough held by two men, the while a third one bears with all his might on the beam, in order that it shall penetrate into the soil to the greatest possible depth. Imagine a furrow at least 15 inches broad, and nearly as much in depth—when the boulder stones will permit—and a general zigzagness of the course of the plough, which would give one of your Ayrshire prize winners "a scanner to look at," and you have a specimen of that department of husbandry. It is the most unscientific process imaginable, and could never be learned by a Scotch farmer accustomed to the turning over of the stumpless and stonless

globe. If his arms were not jerked out of their sockets during the first five minutes of his apprenticeship, he would vow never to use them again during another five in such "wanchancy" occupation.

The "breaking up" being accomplished, gathering in of the Indian corn harvest commences, followed by the securing of the root and fruit crops. These snug—the maize stocked away in the upper chamber of the homestead, and the apples and roots stowed away in the cellar of ditto, with the pumpkins, squashes, turnips, and carrots piled on the barn floor, the cider barrels being first filled—the spring manure must be looked after. All hands go to the swamp, where they dig and cart home large quantities of mossy soil, which they place in the cow yard, that it may have the full benefit of the rains of the succeeding winter and spring, and where the floods may wash the liquids from the stable and byre over and out of it, and down the roadsides and gutters. In the spring this *clabber* is carted to the fields, and contributes very materially to effect nothing for the crops to which it is applied. In summer the sun contrives to do for the little manure made what the rains and snow do in winter.

Fencing is next attended to. All the fences here are of stone or wood. The frosts are so severe as to heave the earth and displace both kinds of protection; but the labours of early spring hinder all but temporary repair until late autumn comes. This job is a hard one, and requires skill in building, and with the axe that one not to the manner born could not successfully exert.

Then follows the preparation of fuel for the coming winter. Shouldering his axe the farmer proceeds to the woods, where he cuts down for family use as much wood as would serve a country weight in Scotland for a couple of years. Stock and branches of the trees are cut into lengths of four feet—then split into sections—three or more, according to their girth—and piled up until the snow falls, when the firewood is drawn home in sledges. All this furnishes hard work, and that of such a nature as to make it uncongenial to one brought up to Scotch farming. The sawing and resplitting of the firewood, with making and mending farm implements and harness, with attending to the cattle—sheling a bushel of Indian corn now and then—taking it to the mill—paring and drying apples for the guidwife—talking politics—sleigh riding, and going to church once a month when a preacher turns up, fill up the time till spring. The domestic and other duties and pleasures are occasionally varied by a "breaking-out spell," when the snow comes down eight or ten feet deep, when the roads have to be dug out, or the snow so sodden that travelling on it is impossible.

When the spring opens, which is about the middle of April, ploughing and planting with the hoe commence. The hoe is the favourite implement used for planting both Indian corn and potatoes. Its use is very laborious and very dilatory. The whole surface, after the crops come up, has to be hoed over at least twice. The close of the hoeing season often encroaches on the commencement of hay time, which lasts at least a month. With the thermometer at 90 to 108, the season is a very severe one on the field labourer. Bush-cutting, to clear up the pastures, and repairing of houses and barns with such incidental labours as belong to the farm, fill up the summer and autumn to the point at which I started.

The New England farmers, as a class, are not so healthy as those of Scotland. They are extremely liable to fevers, which proceed from the great changes from heat to cold which characterize the seasons, and from the use of much salt food. Fresh meat is a great rarity with them, and salt pork its most common substitute. They are a very intelligent class of men;

but, like most farmers everywhere else, as obdurate as mules in resisting every scheme of improvement. No class of men are so wedded to the practical wisdom of their agricultural ancestors. They are very independent and high-minded—keeping away from bargaining. At that they have no equals. You would call their genius in this respect cheating; but, alas! old moral notions are of little service in this new world.

The school is to be found everywhere over the face of New England, and open to all free of charge, or almost so. Town taxes only amount to about 4s. 6d. per caput per annum, and

that covers everything in the way of general taxation—for roads and everything else—schools included. The character of education is not very high in country districts, but the library and the newspaper do much to help it on. The observances of religion are pretty strictly attended to; although it is not at all unusual to see a youth carry a gun or a fishing rod in his hand past the church door on a Sunday on the way to his sport. There are few polemics among us. Political demagogues are the prevailing crop. But I must stay this rambling.—*Ayrshire Express*' United States' Correspondent.

WHEEL VERSUS SWING PLOUGHS.

BY T. BOWICK.

“Facts are chiefs that winna ding,
An' canna be disputed.”

I do not assume the office of dictator, but rather appear as a learner desirous of further information, and the elucidation of both sides of the question. With steam tillage looming in the not far distant future—whether under the shape of Fowler's Ploughs, Smith's Cultivator, or Halkett's “Guideway”—it may be thought late in the day to take up the pen on such a subject. But believing that the death-knell of the plough will not be sounded in our day, I embrace the leisure of a winter's evening to jot down a few thoughts thereon, original or otherwise.

It is usually found that local customs have some solid basis, and it is not wise rashly to depart therefrom. By doing so, many a one has had to gain wisdom, and pay the heavy fees in the School of Experience; while the j.g.-trot practitioner has been reaping a golden harvest in the well-trodden path. Therefore we do not ask from our brethren on the north of the Tweed either a hasty acquiescence in, or a churlish dissent from, anything that may be advanced. Take the remarks for what they are worth. If all is chaff or verbosity, cast it aside; but if there is any grain of truth—even although disagreeing with a previously-formed belief—let it have its due weight in practice. Although upwards of three hundred wheel ploughs have been introduced into Scotland during the last three years, there is still a considerable amount of *distaste*—(I do not call it prejudice, for that is a weed that I hope does not vegetate freely in the minds of the intelligent farmers beyond the Tweed)—with which they are regarded. But those who have known and used the best of both classes of implements—who have both a Scottish and English experience—ought to be in the best position for the formation of a correct judgment on this point. I have, therefore, obtained from men of undoubted ability and position, who combine the two requirements above named, opinions that I have no hesitation in endorsing.

We have at present nothing whatever to do with the ploughs turned out by Howard, Ransome, Ball, Busby, or Hensman in the south, as a class; nor of Kirkwood's, Scoular's, Cowan's, Pontou's, Sellar's, or Barrowman's, in the north. It is simply the principle of *Wheels or no Wheels*—a principle often objected to, as being a piece of unnecessary complication, without any counterbalancing advantages. But there are those advantages, whether you choose to admit them or not. Complication they can hardly be charged with, since we see daily proofs to the contrary. The system in Scotland fortunately does not send the lads to the fields at so tender an age as with us. But here you often find good regular ploughing turned out by youths who would only be entrusted with the “ora horse” in Scotland. Strange proof of complication this! I

u a neighbouring parish—where, however, a considerable stimulus has been exerted by a few men of intelligence and industry—we mean Berkswell, the majority of the ploughmen are *halfplans*—the implements manufactured at Bedford or Ipswich—and the turning over of the soil second in quality or quantity to no district with which we are acquainted. The late lamented Earl of Aylesford, whose seat is in this parish, held an annual ploughing match on the Home Farm, at which it was a perfect treat to see the work, the workmen, and the tools. The fact is, that a good wheel plough, when well set, depends far less for the perfect execution of its work on the skill of the holder than does its swing compeer of the most approved construction. It was but this morning that we saw a ploughman engaged in the double operation of ploughing and, at the same time, removing a partial range of hurdles which threatened to interfere with his return furrow. Over some ten or twelve chains of its length he never touched the plough with a finger, while the furrow was laid correctly and beautifully, at the approved dimensions of six by nine. Not that there is no room for the due exercise of skill and judgment in the use of this implement; for with it as with any other, we find that the quality of the work is proportioned to the skill of the ploughman. Still, we do contend that with a secondary amount of ability, the results are cent. per cent. in favour of the wheels.

A first-class ploughman is undoubtedly a great acquisition on a farm, and the yearly or half-yearly feeding markets fully recognise this. Some farmers *will* have such hands at whatever cost, and, like the late Mr. Gorrie, in the Carse of Gowrie, grudge not the extra few pounds thus entailed. But it is evident that all cannot obtain the best men; and on the generality of Scotch farms, probably not more than one or two of such will be found. Hence arises one advantage of the improved wheel ploughs, in that you can obtain as good and equable work, or nearly so, from the second or third-rate hands, without any deterioration to that produced by the others. The farmer obtains the advantage, and is rendered far less dependent on those in his employment. His foreman, or himself, can see, if needful, the setting of the wheels, which are simple of adjustment, and readily altered according to the nature of the work. The new lever neck is an efficient contrivance for giving the ploughshare more or less dip into the land, while the coulter fittings afford unequalled facilities for placing this part in any required position. All the wearing parts can also be readily replaced in the field by a ploughman of average capacity, which saves many a weary and tedious journey to the smithy. Their strength and durability are beyond question, and with new wearing parts, as required, they

retain the firmly-framed mellowness of a new plough—the desirableness of which all practical men are agreed upon, as an old shaky plough, of whatever make, is of far heavier draught than when it sported in pristine glory. There is no reason why one of these ploughs should not, with moderate care and attention, be equally serviceable at the close of the longest lease or “life-rent” as at its commencement. A well-known East Lothian agriculturist, who has successfully used them on his farm, says that his men consider them more difficult to turn at the end of the field. Good ploughmen in the south complain of swing ploughs for this and other reasons. Custom would speedily remove the barrier in either case. At all events, we find Scotch ploughmen in England almost invariably preferring the wheel plough, and acquiring the plan of *balancing on the furrow wheel* in turning at the land's end. With deep ploughing, say eleven or twelve inches, this is indeed tight work when turning to the left. But as far as turning is concerned, wheel ploughs could be much more advantageously worked in Scotland than in England, since the country is generally laid out in larger fields and wider lands.

Before coming to the important question of draught, there is another objection to which we would refer. It is obviously the interest of the farmer to obtain an implement of the most generally-useful character; not a plough or a harrow which could only be economically worked on one portion of his farm, while for the remainder it was valueless. We by no means advocate the *multum in parvo* principle as desirable for farm utensils generally. There are old-fashioned ploughs, such as the Kentish turn-wrest, which may be converted into a broad-share, scarifier, or horse-hoe, and do all these operations moderately well. Such great conglomerations are often, in plain language, great humbugs. But a Scotch farmer often wishes a plough which will not only do its legitimate turn-over work, but can also be used, by a “ribbing” process, if memory serves aright, for opening and closing the bean, potato, and turnip ridges. Here, again, the wheel plough is complained of, though with what justice we cannot profess to say, as we invariably use and prefer the double mould or ridging plough for these objects. However, in the Warwick neighbourhood, we find that they are pretty freely adapted for this purpose by the addition of a small block of wood to the forepart of the frame, on the near side. And we have there seen, on farms well managed by Roxburgh men, ridging of a character that would please the taste of the nicest connoisseur. Taking Howard's P. P. plough, for instance, you can use it for this purpose in May or June; apply a paring share to it, and skim foul stubbles, two inches deep, in September, turn over the clover or “seeds” for wheat in October; divest it of the mould-board, and add a penetrating share, so as to form a first-rate subsoil plough (following another plough) at Christmas, on the land for next season's roots. In these varied capacities, saving the ridging above referred to, we have repeatedly used this plough, and found it as good a common plough as ever when the parts were replaced. A Berwickshire friend, now farming his own property in this county, who has had an extensive experience on both sides of the Border, says he is convinced that “no plough should be without wheels; but a good wheel plough should also be a good swing plough; and there is no difficulty in obtaining such ploughs. I do not under all circumstances use the wheels.” The occasions in which he dispenses with the wheels are probably in the cross-ploughing of cloddy land, or on wet sticky soil, where the land wheel clogs, and in which case a “foot” should be used instead of the wheel. A very practical fellow-countryman, Mr. Bower, of Long Bennington, writes me on this subject, that he finds another great advantage in these ploughs. “When I break up,” says he, “clover

stubbles for wheat, after harvest, in dry weather—which I consider the best season for strong soils—I can plough with a wheel plough when a spring plough would scarcely face it at all. I also use Howard's in breaking up land for green crops, and in ploughing ten inches deep with four horses, without straining or hurting the plough in the least.” For the latter description of work, our own experience is, that a heavier plough, of the same make, is invaluable. Some agriculturists express their decided conviction that on the lighter descriptions of soils alone are wheel ploughs any considerable advantage; while others say that on heavy soils and deep loams the most favourable comparative results are obtained. We would strike the balance midway, and say that for *all* soils, saving very stony land, or steep hill-sides, their use would be found desirable. This reminds us of the noted report given respecting Ransome's ploughs, at the Southampton meeting of the R. A. S. E., in days gone by. The two-wheeled ploughs, one-wheel ploughs, and swing ploughs were tried in classes, both on heavy and light land, according to the tastes of the exhibitors. “By this arrangement not only was the quality done by each implement displayed, but a fair opportunity offered itself for observing and comparing the quality of the work as executed in the same soil, and under the same circumstances, by the three classes of the implements. The skill of the individual construction was also manifested; and on this occasion the remarkable result came out, that one particular plough excelled all the others, whether working with two wheels, with one wheel, or without a wheel. This plough was one of the three in the field, from the manufactory of Messrs. Ransome, marked Y L. When fitted with two wheels, its performance was like that of a planing machine; the furrow slices were cut vertically from the land, the floors or bottoms were left perfectly flat and clean, and the slices were deposited at an angle of about 45°, with such truth that they could be turned back to their original horizontal bed without gaining or losing ground. According to the generally received principles of perfect ploughing (whether they be correct and equally suitable to all soils and modes of culture or not), it is imagined that practice has, in this instance, closely approached to their fulfilment. How did it happen that the same plough proved to be equally fit for light and heavy land? Messrs. Ransome changed the mould-board from one adapted to light land to one suited to heavy land, an alteration effected in less than five minutes; and abundant proof was afforded to, and acknowledged by, the judges, that one given form of mould-board is utterly inadequate to suit both soils” (*vide Jour.*, vol. v., page 367). This firm has been in the plough trade for a long series of years, and as far back as 1785, the late Robert Ransome, of Ipswich, took out a patent for “making shares of cast-iron.” Since then, other candidates have made most rapid and successful advances for public favour—so much so that the name, Howard, Ransome, or Ball, may almost be regarded as the synonym for a first-class wheel plough.

But some people tell us that on land of a hilly character the wheel plough can never make headway, as it is heavier, and apparently more unwieldy than the swing construction. Now, although we cannot here boast of mountains rivaling the noble Grampian chain, there are yet elevations under culture which manifest the same class of difficulties as may be met among their glens and brae-sides. Take the Cotswolds, in Gloucestershire, for instance. On these escarpments will be found a system of husbandry peculiar to the locality, but admirably adapted thereto. If my reader has ever travelled the bleak road from Cirencester to Stow-on-the-Wold, on a biting, blustering morning in March, he requires not to be told that there are heavy physical obstacles with which the district has to con-

tend. A stiff north-easter blowing off the Scandinavian range, and eddying among the many deep dells of the Cotswolds, will remind him of crests to be surmounted, and braes to be ploughed by implements of some kind or another. The soil is often thin and brashy, the rock at a very shallow depth, and stones in many cases numerous. Surely, here, then, the improved wheel plough must hide its diminished head! In many cases it does so. We find the wooden beam and handles prevailing, with cast mould-board, and wrought-iron shares. These are turned out in the locality much the same as is practised in Scotland. But the mould-board is often on a very incorrect principle—occasionally manufactured of wood—and the draught dynamometrically severe. There are, however, exceptions even here. First-class wheel ploughs are making a steady, onward progress. If a leaf of practice is worth a volume of theory we are ready to adduce the former. A farmer on the Cotswolds, whose practice is second to none I have elsewhere seen, kindly addresses me on this point. He is the occupier of over one thousand acres in the neighbourhood of Northleach:—"I have worked (says he) Howard's ploughs for the last three or four years, and consider them the best for general purposes, doing their work well, and much superior to any others I ever had I think them better adapted for ploughing light stony land, and having two wheels you can the more easily set them—with greater truth; and when set, requiring comparatively little strength to hold. You will in very stony land break a few shares; but their cost replacing is not expensive; neither any blacksmith to pay—a great nuisance saved, as they are very doubtful after being 'done,' and frequently the plough goes badly. I work twelve of them in preference to others. They are particularly good for ploughing our old seeds—('clover')—for wheat, and old sainfoin for swedes and turnips after burning—a system not pursued in your neighbourhood."

It does not follow that because an implement is in itself heavier than another, that its draught is either literally or proportionally greater. Look at the case of a six-horse portable engine and thrashing machine—the former weighing fifty-five hundred-weight, and the latter three-fourths of a ton less. Yet on the road it is not *needful* to put more strength to one part than to the other. And my own impression is, that of the two, the lighter part is the heaviest draught for the horses. This arises from the greater longitudinal as well as lateral spread of the thrashing machine between the wheels; while the engine is a firm compact body, occupying less space. So of wheel ploughs, which you often find from fifty to seventy-five per cent. heavier than a swing plough for the like work. At Paris, in 1855, Ball's plough, which looks fully as heavy as any other, registered 380 lbs., with a furrow of 8 in. by 10 in.; while at the trial on Mr. Alexander's farm, near Laurencekirk, in November last, one of the best swing ploughs registered 694 lbs., when cutting 6½ in. by 9½ in. I readily admit the comparison to be incomplete, without a knowledge of the tenacity of the respective soils, and other attendant circumstances, although it does seem that the difference is indeed great. However, there was also one of Howard's ploughs on the ground, at Bent of Halkerton, which registered 369 lbs. at 6¾ in. by 9 in.; while its most successful compeer at the same dimensions is given at 560 lbs. Surely, there must be some ground for reasoning from a fact like this. At another trial in my native district, also in November last, at Carcary, near Brechin, there was at least one hundredweight of difference in favour of the wheel plough, as compared with the swing at the like depth. Equally successful results have been reported from Athlone, and the neighbourhood of Perth; the former ploughing match being adjudged by men who stand in the first rank of Scottish agriculturists—Messrs. Watson, Keillor;

Dickson, Saughton Mauns; and Elliott, Laighwood. The *Perthshire Advertiser*, of November 25th, says that "the time for executing the allotted task of a quarter of an acre to each plough was three hours and fifteen minutes. About thirty minutes before the time fixed, the Bedford plough had finished its work, and one of the Scotch ploughs within three minutes; but a considerable number of the latter having still a good deal of ground to turn over, the time was extended for half an hour and even with this extension, many of the ploughmen had great difficulty in bringing their work to a close." We must not omit to add, that one of the Scotch ploughs showed the same draught on the dynamometer, viz., three cwt., as Howard's. Having repeatedly tested the draught of a good plough, under different circumstances—such as increased or lessened depth or width, with the coulters at different angles, with wheels and without, with or without the skim, drawing from the end or middle of the beam, or from the body, with additional weight on the plough, at different paces, up-hill, or down-hill, or level work, *et hoc genus omne*—we know full well the care that is needed, in order to ensure a correct reading of the dynamometer. We would almost go so far as to say that the nice fluctuations may be given either way, if the object is to serve a given purpose. Plate XII. in the *Cyclopedia of Agriculture*, with the corresponding article at p. 724, from Morton's well-known pen, will fully illustrate our meaning. But the Scottish trials appear to have been made with care and correctness, and often in the presence of those whose tastes were not in favour of the superior implement. It is true that the ploughman was a first-rate hand, but he had to compete with first-rate hands. It is true that the wheel ploughs were the best of their kind; but it is not less true that in these instances in which the approximation was closest, local plough-makers had become aware of the trials, and lent their aid in bringing new coulters and shares—and in more than one instance, new ploughs—all of which were in advance of those usually found in practice. Whereas, at the present moment, I doubt not but many ploughs in the north will show nearly twice the draught of a good wheel plough, with the same size of furrow slice. I make this remark cautiously, but not without fair proof thereof.

As a whole, these and other trials exhibit the draught as a saving of fully one-third in favour of the wheel plough. This is a matter worthy of the deepest consideration. With prime wheat not much over 5s. per bushel there is every reason for retrenchment. And if the writer is correct in his remarks here is an item of an important character. The saving on one plough being considerable, how much more must it be when multiplied by the ploughs of a large farm or of *bruid* Scotland—

"Frae Maidenkirk to Jobnie Groat's!"

Sir John Forbes lately remarked, that "with three and a half millions of arable acres in Scotland, a saving of an hour per acre in ploughing three-fifths of it would be a gain to the country of 100,000 working days of ten hours each; a saving of 1 cwt. of draught in that operation (to 150,000 work horses) represents an enormous amount of tear and wear." To enter a little further into details, we may take the arable acreage of Scotland at fifty-six thousand acres over Sir John's estimate. Now, according to the statistical return for 1857, this would give the following extent of crops on a farm of 500 acres:—

59	acres	wheat and barley.
136	"	oats, rye, and bere.
9	"	beans, peas, and vetches.
91	"	roots and fallow.
205	"	clover.

Total 500 "

Our object is not to construct a rotation, and we, therefore, follow the statistical order; but taking the clover, or "seeds,"

as being of first and second years' growth, we can see how (by seeding down a portion of the oats after roots) a five years' course could be constructed—or something nearly approaching thereto. On a well-managed farm of this size there would be some 500 acres of ploughing annually, allowing the roots to be preceded by three furrows. I know there are many farmers who would manage medium soils with less than 400. The cultivator—and especially Biddell's scarifier in Norfolk—is to some extent exchanged for the plough. A good Warwickshire farmer, who has travelled in Scotland, and profited by it, says he is not in favour of the land being often ploughed, especially if it is of a light description. "On my farm," he adds, "I do not generally plough more than three times for five crops. First, plough up the seeds for oats; second, manure and plough for beans and peas—then scarify for wheat; third, give a deep furrow for swedes—afterwards scarify for barley, and sow down to seeds again." But to return from this digression. With 126,471 working horses in Scotland, the strength for such a farm would be about nine pairs. Although the calculation is seemingly high, we simply give it as founded on these data. A saving of *one-third* in draught ought to show it somewhere; either in the corn-bin, in the earlier finish of the operation, or in effecting a deeper and more complete tillage of the soil. It is not too much to say that it would show itself, to a greater or less extent, in all these respects. If we take Sir John's hypothesis of an hour per acre saved in the operation, from less expenditure of strength, we gain at least eight weeks' ploughing of a pair of horses—no mean adjunct it will readily be allowed. We believe, however, that the saving would manifest itself in a less obtrusive, though not in a less tangible form. Mr. Leonie's *Gold Medal* Report of Ploughing Experiments, in the *Journal of Agriculture*, gives some tabular results of a valuable character. Comparing the produce of oats, after ploughing performed by Small's, Howard's, Yester, and Currie ploughs, he says—"Howard's prize wheel plough gives the greatest amount of produce both in grain and straw, taking its combined plots, as given in table No. III. The work

was exceedingly well executed, especially of No. 4, the man having a premium awarded to him. The work of No. 9 (both Howard's) was nicely cut; but not so well closed as it should have been. This plough, from its light draught, and being easily held, promises to come into extensive use. It is so constructed that it can be adjusted to any kind of work in the field by the ploughman with facility. The furrow-slice is rectangular, the sole of which is cut flatter, and is cleaner taken up than that of any other plough the reporter has seen working."

There are other matters to which we might refer, were our object to aim at "special pleading." We have endeavoured, in the preceding remarks, to show that wheel ploughs are not the complicated pieces of mechanism which some people give them credit for being; that they are simple of adjustment, and can readily be repaired; that they are decidedly advantageous to the farmer in improving the work of his second-rate hands; that they are easier for the ploughman, lighter for the horses, and of national importance as a saving of useful power. If anything has been advanced contrary to facts I will gladly acknowledge the mistake. If aught has been said in a dogmatical or discourteous tone, the writer honestly regrets the same. But he lays down the pen in the fullest conviction of having adduced facts worthy of unbiassed consideration; and thoroughly believing that at no distant date will wheel ploughs predominate on the North of the Tweed. I doubt not but the leading manufacturers are disposed to do their part towards it. It is for their interest to do so, for, as one of them recently expressed it, "the Scotch are excellent in correspondence, and prompt with remittances"—a character to my countrymen which I feel some amount of "Hieland pride" in repeating.

"Rear high thy bleak majestic hills,
Thy sheltered valleys proudly spread;
And, Scotia, pour thy thousand rills,
And wave thy heaths with blossoms red."

Stoneleigh Abbey Farm, Kenilworth.

WARWICKSHIRE FIELD CLUB.

The annual meeting of this society was held on Monday, Jan. 31, in the Society's Rooms, Warwick, when a very interesting paper was read by the Vice-President and Honorary Secretary on bone in the lias formation; a subject of great importance to agriculturists. The president's chair was occupied by C. Wren Hoskyns, Esq.; and among the gentlemen and archaeologists present were the principal scientific men of the neighbourhood, together with the members of the "Field Club." In introducing the principal paper, the President drew the attention of those present to the immense fund of knowledge and observation which the field meetings gave, at the same time noticing the operations of the societies having Warwick, Worcester, and Gloucester for their centres.

It may be necessary to state that, during the summer months, the members meet together under the designation of the "Field Club," and explore or examine the botanical, geological, and other peculiarities of the neighbourhood; and last year the bone-bed at Knowle was examined by the Club. The visit to Wenlock-abbey showed them abundant relics of the ancient Silurian epoch, principally coral, and long since passed away; and a splendid view from a plateau, similar to that of the celebrated city of Lisbon from the Tagus; and, lastly, the dip of the millstone grit with the Wenlock limestone.

Mr. BRODIE then gave his promised quota to the proceedings of the day. The productive researches of the geological section during the summer months induced him to draw their attention to the result of the first meeting of the season, held at Knowle. The lower beds of the lias, as its name implied, consisted of layers of limestone, clay, and shale, containing a variety of organic remains, chiefly marine shells, with occasionally fish, lizards, and portions of insects and land plants. Some of these strata, he continued to say, are well exposed at Wilmcote and Harbury, in this county. We have here, at all events, indications of terrestrial conditions, and a sea of no very great depth, highly charged with carbonate of lime. They are not only interesting on account of the many beautiful fossils they contain (and of which the Warwick Museum has a very fine and instructive series), but are also valuable for various economical purposes; more so, indeed, than any of the upper portions of this formation throughout its range in England, except in Yorkshire. THE BONE BED AT KNOWLE.—Some of these beds occur at Knowle with fossils; but the succession there is less easy to trace out, because they are not exposed in any open section, being quarried by a shaft; and the works are now discontinued. As far as he could judge, from the small quantity of limestone and shale visible, he was dia-

posed to consider them as the equivalent of the saurian beds in Gloucestershire; and the more so because the latter is full of a beautiful small ammonite, which characterizes it, viz., the *Ammonites plus*, which is found in equal profusion in the same land in Somersetshire and Gloucestershire. It is impossible to say whether the insect beds occur at Knowle; but it may be inferred that the thickness of the lower lias here is not very great, and it is of very limited extent in this district. The fact of the presence of this formation at this spot is worthy of note, as it is the only patch of lias for several miles, being what is called an "outlier," that is, lying away from the main mass. In many places these outliers form prominent hills or "knolls;" and the village of Knowle evidently derives its name from this circumstance, though not, perhaps, so prominent or distinct as other outliers often are. This patch of lias occurs along a line of "fault" in the midst of the red marl, by which it is surrounded on all sides, and is eleven miles distant from the chief escarpment of the lias on the south. The whole outlier is about a mile and a half in length by half a mile in breadth. In order to explain the subject more clearly, he briefly pointed out the range and extent of the lias in Warwickshire. It might also be traced along the banks of the canal, near Hampton. A small section might be observed in the adjacent bank, resting on the red marl; and this section presented, on a reduced scale, the lowest strata at the base of this formation, similar in some respects to the basement beds visible in Gloucestershire, Worcestershire, &c. The bank appeared to consist of clay, with an included layer of sandstone, containing casts of the small bivalve shell called *Pullastra arenicola*: and although no actual bone-bed was here observed, there was sufficient evidence to show the occurrence of a sandy bed connected with it, belonging to the base of the liassic system; and, indeed, it is highly probable that if the section were more exposed, the bone bed itself would be detected. Hitherto this is the most northern point where it has been observed; and the Field Club did a very good day's work in noting this fact, slight as it might appear to the uninitiated. Having explained the peculiar formation of the hills at Knowle, the rev. gentleman proceeded to state several facts connected with the bone-beds generally, from which we select the following:—The bone-beds in the lias consist of a thin dark-coloured stratum, containing comminuted fragments of fish and saurians with teeth and coprolites, always occurring at the base of the lias. It has been noticed at Axmouth (Devon), Auscliffe and Watchett (Somerset), Westbury, Wainlode Cliffe, and Coombe Hill (Gloucester), and near Wilmcote, in this county (Warwick), the two extreme points being 140 miles asunder, its furthest northern limit being Knowle. Here and at other places, the only shell impressed in it is the *Pullastra arenicola*, which apparently created furrows when its foot (crawling) passed over the soft mud, now sandy stone. Even this pseudo insignificant mollusc served to identify the bed. The value of even a single fossil in identifying a single stratum over a wide area deserves attention; and those of the members commencing the study of geology will find it both useful and encouraging to bear this in mind: no fact, however trivial to careless eyes, will be overlooked or deemed unimportant; for it may lead even to great results, and indeed one recorded fact is worth a hundred hasty generalizations or ill-advised theories, and he who makes good use of little things in science does his work well, and certainly is a far more useful member of society than the

masses who pass through life without an object to attract them, or without ever having done anything worth recording. The abundance of animal remains on these bone beds would favour the opinion that the phosphate of lime might be useful for agricultural purposes, just as the crag in Suffolk and the upper green sandstone at Cambridge are marked and largely exported for the same purpose. With this view, he sent up some specimens of the bone bed (among other things) to the Great Exhibition; and the only drawback to its application to agriculture is the quantity of IRON PYRITES with which the stratum is charged. But the iron is not without its use in other ways. The mineral waters of Cheltenham are well known; and although it cannot be positively proved (no well sinking ever having yet reached the red marl there) that the bone bed exists under the town, it may be fairly inferred that it does, from its contiguity to it not many miles distant on the road to Tewkesbury. Whether the bone bed is there or not, the water which rises from the red marl, and passes upwards into the lias through certain cracks or crevices, obtains its valuable medicinal qualities from the quantity of sulphuret of iron [iron pyrites] disseminated through the clay, and such an abundance of it as the bone bed contains would have more or less effect on the saline waters emanating from the red marl below.

The CHAIRMAN, in proposing a vote of thanks to the Rev. Mr. Brodie, for the paper and remarks he had given, cordially hoped with him, that an impetus would be given to their movements. The application of bone-dust to agricultural ends was an important, a very important question, and especially to their farming friends. (Hear, hear.) The upper green sand, as had been stated, had yielded a considerable quantity of bone-dust for exportation; and he believed it had been used in the hop districts to a very great extent, proving a most valuable manure. Singular to say, the pre-Adamite world seemed to furnish us with manure derived as it were from the entrails of animals, upon which [*i. e.*, the manure] the farmer of the present day grows his turnips; and no doubt (he continued) he *does* grow with that manure, because it is the only form in which the phosphate of lime can be obtained. There was but one locality whence the phosphate of lime could be used in the same way as the super-phosphate produced from the bones of animals recently dead; and the bone-manures were not only universally used, but they were the cheapest source; and though he must admit they were not pre-excellent, still the gain in economy was great. It was thus that antediluvian remains had actually furnished manure sent from Birmingham, London, and all the metropolitan depôts throughout the country, as better calculated to produce that most important "crop"—the turnip crop.

The vote was carried *con amore*; and, after a discussion on the preservation of Shakspeare's house at Stratford, and other points of purely archeological interest,

Mr. BROWN, of Hilton Park, moved a complimentary vote to the president for his able address. It was accorded and acknowledged.

The proceedings then became purely scientific and paleontological.

A visit was paid subsequently to the Cotton End Quarries, and Mr. Perry, the secretary, directed attention to the unbedded bones of a labyrinthid. Mr. Brodie conjectured the remains to belong to the huge animal's cranium. The party then adjourned to dinner at the Woolpack Inn.

THE GAME LAWS AND THE FARMERS.

The opening paragraph of her Majesty's Speech refers with much satisfaction to the decrease of pauperism and crime. The absence of the one may, indeed, tend very much to the suppression of the other. In the rural districts, more particularly, necessity has been generally the incentive to dishonesty. As an almost natural consequence, people with the opportunity of doing well will not care to do wrong, and our work-houses and our prisons are alike relieved. In fact, there is just now but one serious class of offence associated with the habits of the farm-servant and village-artizan. Sheep stealing, stack burning, machine smashing, and other such malpractices have long since gone out of use. But poaching still offers all its irresistible attractions. We have yet the every-day case of the father of a family committed for a month or two, for snaring a hare or a pheasant. We continue to read of midnight onslaughts, fearful affrays, the shedding of blood, and even of the further loss of life. While we have successfully combated with other evils, we leave this one quite unscathed. The preservation of game is still regarded as a great good, worthy of all the protection the Legislature can afford it. And farmers lose their money, labourers their liberty, and keepers their lives in the maintenance of such a system.

The field sports of Great Britain have long stood pre-eminent. They have tended, indeed, in no slight degree, to form and distinguish our national character. The dash and enthusiasm of fox-hunting will teach a man to charge at anything. The cool skilled courage of the cricketer will always serve him in good stead; and the energy and bottom of the stalker or shooter go equally to make a man sound in heart and body. Fortunately, moreover, such pursuits are attended with but few drawbacks. Hunting has hardly an enemy, without it be the game-preserver. Cricket is the amusement not of one, but of all classes of our countrymen; and the sportsman who steps fairly out to find his own birds, and get a shot here and there, has a welcome as hearty as any. It will be in an evil hour when we attempt to interfere with or do away with our people's pastimes, be they those of high or low. But is this monstrous over-preservation of pheasants, hares, and rabbits really an English sport? If we wished to show a foreigner what an English sportsman was, and what he could do, should we take him to a battue? Is there anything either manly, invigorating, or even skilful, in the conduct of such a business? Let him picture four or five gentlemen "placed" in rides and corners, with one gang of men to drive the game up to them, and another set of servants to load their guns for them. Let him see the cover swarming with hares, and the air darkened with pheasants. And let him watch these great English sportsmen blazing away into the middle of them, with scarcely the need for either aim or exertion. They

have not to walk half a mile the whole day through. There is neither the pleasure of seeing their dogs work, nor the excitement of beating up to and springing their own game. There is far too great an abundance for anything of that kind. Their only point or challenge is the continuous "cock"- "hen" cry of a beater; and their only relief to this monotony of slaughter the hot lunch, which is ordered at the head of the wood for two o'clock.

We boldly maintain that this is not sport, or, at any rate, certainly not the sport of Englishmen. Is it then worth upholding, if we but consider the monstrous abuses and injustice with which it is maintained? The over-preservation of game does injury to almost every class such a practice can in any way affect. It is the one great drawback to the popularity of the country-gentleman, to begin with. What, as often as not, will he do with this immense quantity of game when it is once carted? Does he not send it as systematically to the poulterer as would the very poacher he is so bitter against? Is not his keeper an unwarrantable spy over the whole district, making bad blood and ill-will almost everywhere he goes? Then, again, as regards the farmer, this excess of vermin is the greatest impediment he can have to contend with. Leases, liberal covenants, or even compensation for the damage, can avail him but little, if all he has done is to be wantonly undone again in this wise. But no tenant ever yet really received actual compensation for such description of losses; while in the majority of cases he has hardly more than nominal recompence. We have galloped through wheat in July, that, as the occupier admitted, "you could not hurt," with two game-preserving landowners, each equally reluctant to allow it was his fault. We have seen keepers come methodically round, to drive the game in again after feeding, from another man's lands into their own master's covers. The uncertainty as to whom it belongs, or to whom he should properly look, has beat many a farmer before now, as it will beat him again. In fact, no man, however striving or able, can contend against too great a head of game. He loses not merely his money, but with it his independence and self-respect. How can any one feel, who is perpetually dogged and directed by another's servant, and whose greatest enemies are positively the other's perquisites? "The rabbits belong to the keeper;" and we can well imagine what this official's animus will be, when he sees an occupier exercising his now just right, and destroying those on his own holding. How he will follow every shot, and try to make out "It wasn't the rabbits *only* Mister was after!" In short, a gamekeeper with his present excess of authority, and leave and license to go when and where he pleases, is a positive curse to a country. He creates dissension between landlord and tenant; he is continually laying traps and

pitfalls for the workpeople of the place; and he more often than not destroys sport rather than conduces to it. For the sake of showing a good head of game, and with an eye to his own rabbits, how many a gallant fox has fallen before him, and how many a blank day has "the country" had in consequence! The man, in a word, is in a false position. He is invested with a power and importance far above his proper station in life, and he can scarcely fail to go wrong. Like Phaeton, with the horses of Apollo, he holds the reins that never should have been entrusted to him. As a man of capital, intelligence, and spirit told his late landlord, when he met him recently in town, "We should never have parted, as you know, sir, if it had not been for the keeper; but I could not stand him." And the other's only answer was the echo—"I know it."

We trust never to see the English gentleman denied those sports and pastimes that endear him so much to his own home. We repeat, there is good policy in encouraging them. But we deny that battue shooting is sport; and we hold that the rearing of hares and pheasants wholesale—too often at another's cost—and then slaughtering and selling them wholesale, is incompatible with the character and fine feeling of a gentleman. There are hundreds of tenants, whose farms swarm with game, that do not get a brace in the year; they are bespoke by the dealer. Others are certainly more liberal, and it was only within this week or so we came across a flaming paragraph detailing how many hundred hares and pheasants Lord Smashford and two or three friends had killed in two or three days; and how, with his lordship's customary liberality, these had been "distributed amongst the poor *and* the tenantry"! A fine compliment this, certainly. What John Ploverman does not want, you can let the farmers have.

Mark the greeting between the squire and his tenant at the cover side. Visit the latter at his homestead, and note the brush twined over the mantel-piece, the portrait of the favourite horse, or the well-cherished print of my Lord and his Hounds. There are no truer friends to field sport as it should be, than the farmers; and for this reason let them not fear to speak out. We would not have them follow the mere lead of any other class. But in these times they must not shirk an abuse that is a manifest injustice to themselves, and a wrong to all. The produce of the country is wasted, the lower classes continually tempted and trapped, and a spirit of inquisition exercised wholly un-English in its character, and unwholesome in its influence. Our lands can be turned to a far better use than feeding a plague of hares and rabbits; and there is fortunately employment enough for our labouring population to keep them above the degrading duties of spies and watchers. As a simple question of economy the point is all one way; and prosecution expenses and keeping poachers in prison are items in a county's expenditure that might be put to a far higher purpose. No "establishment" of keepers and their subordinates can ever set off such an unprofitable outlay.

Some have already begun to speak out. Mr. Jackson,

by his address at the Winfrith Club, has commanded an attention that clearly shows how much may be done. We publish with this a resolution from the farmers in the neighbourhood of Blandford, in hearty support of what he has advanced, as well as in sympathy for the manner in which he has been attacked. But Mr. Jackson needs no such commiseration. The highest compliments paid to his address have been the impotent answers attempted to it, and the petty indignities levelled at himself. You may often test the strength of an argument by the opposition it encounters.

SIR,—Having honoured the Winfrith Club by giving their discussion on Game, &c., the benefit of your extensive circulation, I take the liberty to ask that the enclosed may also find a place in your columns, to show that other Dorset farmers are ready to support free speech in the right direction, although coming from one so insignificant as myself.

I am, Sir, yours truly,

T. S. JACKSON.

Blandford, Jan. 29, 1859.

SIR,—I am directed by the committee of the Blandford Farmers' Club to send you the copy of the resolutions come to by them this evening, and to state that you are perfectly at liberty to make what use you like of it.

I am, Sir, faithfully yours,

Mr. T. S. Jackson,
Rempstone.

W. H. ATKINSON.

COPY.

"That the Blandford farmers beg to express to Mr. T. S. Jackson their entire concurrence in and approval of the sentiments uttered by him in his lecture delivered to the Winfrith Farmers' Club, on the 17th November last, and also their sympathy with him under the unpleasant consequences entailed upon him by the free expression of his ideas on that occasion, and they regret that any person should have thought fit to cavil at the remarks there made, or the mode in which he expressed them."

TO THE MEMBERS OF THE BLANDFORD FARMERS' CLUB.

GENTLEMEN,—It affords me very great pleasure to thank you most sincerely for the expression of your approval of my sentiments on Game, &c.

So unexpected a proof of kind feeling coming from such a respectable body of agriculturists more than repays for the attack made upon me by those who must have known they were misrepresenting the tone of my address; for it is evident, on reading the discussion, that it is anything but "a wholesale attack upon the aristocracy."

The only cause for regret I see in the matter is, that any English paper should be so unfair as to allow certain charges to be inserted against an individual, inviting an answer, and then to refuse the reply; however, I rejoice to believe that this little opposition has only strengthened our cause, and given it greater publicity. Trusting it will result in much good,

I am, Gentlemen, yours sincerely,

Rempstone, Jan. 31, 1859.

T. S. JACKSON.

THE CAPE WOOLS.

The sheep-farmers of South Africa are at last beginning to understand the impolicy of the course they have so long pursued of shearing their sheep twice a year, instead of allowing the fleece to grow to a full twelvemonth's staple, which would realize a much better price in the home-market, and better meet the requirements of the trade.

Southern Africa is fast overtaking the Australian colonies in the production of this valuable export; for while the imports of the latter have been almost stationary or rather declining within the last six years, the Cape has doubled its exports. In 1853 the total imports of wool from the colonies were 177,267 bales, of which 22,098 bales came from the Cape of Good Hope, and the remainder from Australia and New Zealand. Last year the total imports of colonial wool were 218,608 bales, of which 56,032 were from the Cape, against 152,576 from Australia. The Cape Colony and its adjuncts now rank second on the list of exporters of wool to this country, taking rank after Victoria, and heading New South Wales, which used to send double the amount received from Africa. A consideration of these facts cannot fail to give importance, in the eyes of the British public, to our South African colonies—possessions which many Ministers have been disposed to abandon as expensive and troublesome settlements: and yet this productive development of important staples—wool, skins, hides, tallow, wine, and grain—are only in their infancy.

A good supply of wool is essentially important to our commercial greatness, and to the continued prosperity of our woollen manufacturers. Already these are beginning to complain of insufficient supplies; and where, but to our colonies, are we to look for increased quantities? The large demands for wool for the continent, for America, and other quarters, keep up prices; and the yearly progress in the production of wool is not so large as it might be if proper exertions were made. With the exception of South Australia and New Zealand, our other southern settlements at the antipodes are sending us less wool than they did a few years ago; and the total import last year of foreign and colonial wool was much below that received in the previous year.

Looking at the growing importance of the South African wools, we are glad to see the wool-growers there are alive to their own future interests in endeavouring to improve the quality of the staple so as to raise the character of the Cape wools in the British market.

Previous to 1833 the only sheep, with few exceptions, to be found in the Cape Colony were the broad-tailed Cape sheep, bearing no wool. But in that year a few merino sheep were brought over from Australia by a trading-vessel, and were found much superior to the fat tails, and admirably suited to the country. The wool exported in 1833 was but 113,000 lbs.; now it exceeds 16,000,000 lbs.

Flocks of the purest-woolled sheep—Cheviot, merino, and other breeds—are now to be found in the grazing districts of the Cape Colony, Natal, and the Free Dutch States; recently, too, the Angona goat has been introduced, and is becoming a great favourite.

Our last files of Cape papers are full of instances of the marked desire to retrieve the character of their wool, which has hitherto been considered of inferior staple, and wanting in that peculiar fineness suitable for many of the large manufacturers. The colonists are importing valuable rams to improve their flocks, and it seems quite a rivalry with the farmers who shall have the best stock of rams; but they have hitherto very inconsiderately spoilt that they spent so much money to accomplish, by clipping the wool when half grown.

In one of the recent annual wool-circulars, Messrs. Hughes and Ronald, speaking of Cape wools, observe: "This description continues to gain in public estimation, and these colonies are evidently destined to take a high position, from their peculiar adaptability for the growth of fine wools—particularly of fair useful qualities; and the extent to which it may be carried seems almost without limit. The rising colony of Natal appears, in particular, to offer a wide field to the enterprising colonist, there being an abundance of open country, well suited to pastoral purposes. A great portion of Cape wool is open to the objection of being of a flimsy character; to obviate this a constant and judicious infusion of fresh blood is necessary; and if not available in the colony, no expense should be spared to procure the same from Europe. The great demand here is now for wool of strong fibre—a property that the Saxony sheep possess over the French, and hence the introduction of the former will be desirable. No species of wool of immature growth ever attained this strength of fibre, and is therefore unsuited for the manufacture of strong cloths, so much in demand for export."

Although we doubt not the Saxony rams, now largely imported into the Cape Colony, will be an advantage, yet we also consider the beautiful French breeds imported by several of the sheep-farmers, will, if their fleeces are allowed to grow to maturity, realize first-class prices, do a credit to the importers, and retrieve the character of the wool of the Eastern Province. The short-wools, from Algoa Bay, are seldom looked at, during the sales, until there is nothing else for the manufacturers to buy.

The Fort Beaufort Agricultural Society assembled recently a meeting of farmers, at Haddon, for the purpose of discussing the best means of raising the character of the Eastern Province wools in the home-market; and although it was admitted that a sheep shorn twice in the year will yield a greater weight of wool than it would if shorn only once a year, yet it was shown that the wool was only of half the value. The farmers present, after full discussion of the best

means of regaining the character for good wool formerly enjoyed by the colony, pledged themselves not to shear their sheep's wool under a ten months' growth and well got up. They also determined on appointing an agent, to send home the wool of such members as were desirous of selling in the London market, under the guarantee and mark of the Society, with the owner's name in full on each bale.

Wool has made the Cape Colony what it now is; its towns, villages, and lands owe their value to wool. England itself is mainly dependent, in her present greatness, on wool; and its acknowledged worth is rapidly inducing other nations to cultivate its growth.

Russia is holding out inducements for experiments on an extended scale in her vast dominions. India and America are also fast bringing themselves into notice as wool-producing countries. The quantity of wool now received from India nearly equals that from the Cape. Her soil, her climate, her race of hardy enterprising men—all favour the rapid and successful growth of wool in South Africa; and it is a well-known fact that there is a tendency (attributable to the very dry nature of the climate) in wool to become fine. Yet we hear of dirty, kempy, ill-washed, short wool—a character which ought not longer to attach to Cape wools.

THE LAMBING SEASON.

The importance of this subject to every sheep-breeder prevents the necessity of an apology for so repeatedly recurring to it on the approach of every season. My great aim and desire is to call immediate attention to its many details in management, and to the various methods and plans in general use for ensuring a prosperous lambing season.

THE PREPARATION OF THE EWE FLOCK.—One of the most important is the preparation of the ewe flock for this hazardous and interesting time. This must chiefly depend upon the variety and nutritive value of the food supplied. Ewes depastured upon good grass pastures through the winter, with an occasional supply of roots in precarious and severe weather, so that they are kept in a fair and thriving store state, generally produce a healthy fall of lambs, without much loss to the flock. My own flock is always wintered in this way, except that they are *daily* supplied with a few mangolds, rather than with an occasional supply in bad weather. The usual allowance is at the estimate of a small mangold to each animal per day, commencing on the 1st of January. By this course the stamina of the ewe is upheld to the time of lambing, whereas an occasional feeding only causes restlessness and worrying in the animal—they are running after every cart; and what is worse, this irregular feeding is injurious to the constitution, and fever is induced after parturition. Ewes cannot be kept too quiet, and they must be fed with great regularity and upon food of like nature—a change from grass to turnips, from turnips to mangolds, from mangolds to swedes, or *vice versé*, or again to grass; or if these various roots are given them on grass, or in inverse order as named, it is almost certain to have a decidedly bad effect upon some of them. Great care, then, I repeat, must be given to keep them well, without any violent changes, taking care not to get them up into too high condition. Depend upon it, much of the success in the season is owing to their previous good management. If their condition is too high, fever and mortification are the certain accompaniments of lambing in many cases, besides a short supply of milk, the secretions for which having gone into the animal's fattening matters. If their condition is too low, then typhoid fever, loss of

milk, sloughing of wool, and in very many cases death ensues, or the animal becomes a worthless crone. A moderate allowance of oats, or cut chaff from oat-sheaves, is a very useful addition in very bad weather, but not necessary or desirable throughout the winter.

Ewes wintered upon coleseed or turnips, if they are not too "fresh," generally do well, provided the food itself is of healthy quality; but I have known very serious losses arise from wintering them on mildewed crops of either sort. To keep the ewe flock thriving and healthy, it must be fed upon good and sound food, without much variation in kind, as I have already said. It is also indispensable that, as they are wintered, so they must continue on such keeping till the season is over. It will by no means do to take them from turnips or coleseed to grass in order to lamb, or *vice versé*; but if such a change is imperatively necessary, it must be very gradually made. It is, however, better to permit them to lamb upon the same kind of keeping as that upon which they have been kept for the three previous months, and then make the change.

I am by no means sure that the customary plan of collecting them into "a lambing pen" or paddock is the very best course; at all events it should merely be for the night, to have free egress in the morning to rove about their fields. Close confinement after a winter's freedom is bad; besides, the paddock soon becomes tainted with various matters connected with the lambing season, and contamination with mortifying substances is sure to produce the like effects in whatever animal comes in contact with them. Air, exercise, abundance of nutritious food, and cleanliness are great elements of success in every lambing season. I highly approve of the roomy paddock, well sheltered, and provided with many separate pens, closely made, and through which the rough storms can find no entrance. In this paddock I would collect the flock on dark nights and unsettled weather, but on the fine and moonlight nights I would leave them in the field, provided the shepherd could have a fair oversight of them. I am convinced that this is the most healthy course, and with ordinary care no loss of lambs will take place. It is at some inconvenience to the shepherd; but his accustomed ear, if

not the eye, will detect any signs of pain in any particular ewe, and then his judgment must dictate the best course to be pursued. I have so often written upon the mode of treatment during the pains of parturition and subsequent treatment, that I feel ashamed to recur to it so often; but our readers are many, and from the great increase in the circulation of the *Mark Lane Express*, so new to me, that I may be permitted again to recapitulate a few of the heads of the management of ewes in the lambing season.

1st. THE SHEPHERD.—He ought to be a careful, patient, kind, and cautious man. His care must be unceasing, his watchfulness incessant, and his industry in providing every requisite of food, shelter, and individual conveniences for each case must be unlimited. He should provide himself continually with the following aids: a crook; a cord, and small button hook, for bad presentations; a small phial of laudanum, to administer a spoonful to allay pain in bad cases; and a bottle of milk, well sweetened with treacle, for like cases, to refresh and restore the ewe, and occasionally to aid the young lamb if the dam is short of milk. In distant fields he ought to have a lambing-house, provided with a fire and warming appliances for starved lambs; and his time should be wholly given up to the ewe flock during the season. On no account must his hands come in contact with putridity.

2nd. THE EWE.—This, I trust, is in a healthy and proper state for lambing—free from disease, and in good store condition. When the actual pains of labour have commenced, the shepherd should examine her to ascertain that the presentation is right; if so, she may be pretty nearly left to herself; but if the labour is protracted, he must render assistance, otherwise the lamb will be a dead one when it comes. She must be gently laid upon her side, the fore-fingers to be inserted in her barren, and one leg after the other be brought forward, keeping the nose or head in its proper place. He may then gently draw with one hand, while with the other he must endeavour to open the aperture, and put back protruding skin, &c. Having thus by degrees made room and brought the lamb forward, he may then take both hands, and with moderate force pull the lamb away. He must immediately clear its nose, and open its mouth, and encourage it to draw its first breath. As soon as it breathes freely, and the ewe is a little rested after her severe labour, he may proceed to suckle it, taking care to clear the udder from all wool likely to be drawn into the stomach by sucking. The choice of a dry warm place for the lamb and a nice tempting root or cabbage for the ewe will complete the case, unless it is a very bad one. He must in that case give a tablespoonful of laudanum, to lay her quiet and keep her from paining, till the parts in a great measure resume their proper position and functions. On no account apply sharp oils or dressings to the womb—a little lard or oil is preferable. On the morning following parturition, after the application of laudanum, the ewe will require a little gruel or cordial-stimulant, but nothing likely to induce fever; should, however, fever come on, she will require very careful nursing—a dry shed, bran and oats for food, with sliced

turnip or mangold, and a constant supply of gruel or possett. The gruel made from wheat-flour mixed rather thin with a little salt; the possett as above, *i. e.*, milk with treacle or coarse sugar. As she improves a little, her possett may be half water, half ale, thickened with flour, and a little ginger, peppermint, or carraway may be added. On no account let her get wet.

3rd. WRONG PRESENTATIONS.—These are the most difficult cases, and generally arise from some foolish mismanagement. The shepherd's dog may have run them too fast; they have jumped over ditches; the hounds have alarmed them, or some such cause. Well, the ewe is examined, and "the lamb is wrong." The shepherd must now bare his arm; take a little lard, and but his hand; then carefully and gradually insert it into her uterus, and force back the lamb into the womb if necessary, and if possible turn it right; then take the cord on his finger, and place it on the fore-legs, and gently draw the lamb forward, and so away. It is sometimes impossible to get the lamb right. The cord must then be put upon each leg separately, and the lamb drawn away piecemeal. A right presentation is the nose lying between the fore-legs; but occasionally the hind-quarter comes first; in some cases it may with safety be thus drawn away. Of course, the ewe in such cases will require the best nursing, as named above. I merely give these more important outlines: the whole subject would occupy several papers.

FANNY'S BARN-YARD SONG.

Clucky! chick! chick! O, come along quick;
 From my little fingers a crumb you may pick.
 Quake! quake! quake! says the white old drake,
 And the ducks shake their tails with a short little shake.
 Quack! quack! quack! says the one in black,
 And they split their throats as they answer, Quack!
 Cock-a-doodle-do! here's a health to you,
 And the rooster bows to the feathered crew.
 Cluck! cluck! cluck! I wish you much luck,
 Says a mother hen to a setting duck.
 Pe! pe! pe! O, pray wait for me,
 Says the turkey brood, as plain as can be.
 Gobble! gobble! gobble! my snout's in a hobble,
 Says the strutting cock with an ugly bobble.
 Pot rack! pot rack! I'll quit such a pack,
 Sings the Guinea-hen, as she flies the track.
 'Taint never no use, screams a sensible goose,
 To mind the rude ways of fowls what is loose;
 Then hissing aloud to the wondering crowd,
 She waddles away, quite happy and proud.
 Now the peacock tries, with his hundred eyes,
 To astonish and awe; but the Shangaies rise,
 And clearing their throats, flap their short-tailed coats,
 While they sweep the barn-yard of corn and oats.
 Then the Poland duck, with his comb in a tuck,
 Gives a foreign twirl to his best tail curl;
 While a bantam swell goes on tiptoe a spell,
 To escort for a while a Cochin belle.
 Then they crackle and crow, hiss, gobble, and blow,
 And all speak at once, both high and low.
 Hush! hush! hush! cry the Muscovies, hush!
 We are whispering secrets as soft as mush;
 Then bowing around, almost to the ground,
 They, bobbing, retire with a murmuring sound;
 And chicky! chick! chick! O, come along quick,
 Brings order again, while a crumb they pick.

—*Journal of Commerce.*

THE IMPLEMENT PRIZES OFFERED BY AGRICULTURAL SOCIETIES.

BY A PRACTICAL FARMER.

I have read with interest, and no little concern, the report of the proceedings of the Bath and West of England Society relative to the abolition of prizes for implements at their meetings. I am an old practical farmer, and, I may add, an old judge of implements, having attended at many shows. I have lived long enough to see vast improvements in agricultural mechanics brought out under this system of prizes; and I most strongly advise to "let well alone."

The prize system began in the last century. The Holkam and Wobourn sheepshearings were the great progenitors of the system; but it was not till the general establishment of agricultural societies, and the offer of prizes by them, that agricultural mechanics attained any decided advancement. It is an undoubted fact that the great advances made in agricultural mechanics is attributable mainly to the encouragement held out to mechanics by the suitability of the prizes and premiums offered by these societies; and the science is still advancing, and most satisfactorily too, under the system. Why, then, are we to have such bold, such rash, innovations? Surely the love of change, or the hope of saving the society's funds, has not been the object. I have the pleasure to know several of the Bath and West of England men. No men deserve greater credit, or possess greater zeal and ability to conduct a society; but I do not favourably look upon them in the light of originators. They are capital managers, and show great industry and taste in their respective departments; but when they set about a revision and a remodelling of the fundamental objects of their society, I do demur to their judgment. It is no light thing to attempt to make a great and decided change in the most important part of the society's operations. I think they are wrong, and will repent their doings: their show will now be an implement bazaar, and nothing more—no trials—no awards.

Every Englishman knows the true meaning of the word "prize," and duly honours it; but it is only the initiated who would fully understand the true meaning of the words "certificate of merit"—a scheme advocated by some of our leading manufacturers, and others. Our countrymen's habits are slow to change. They love old-fashioned words, particularly if full of meaning. The word "prize" always gives its full significance; it will be long before "certificate of merit" would convey as much. Besides, what implement is without merit, less or more? and the certificate would merely certify to its correctness. Depend upon it, our commonsense men of business would be far more likely to purchase a prize implement than a certificated one.

Now, let us look into the subject a little, and see wherein lies the difference. The old plan gives first, second, and occasionally third prizes; then we have

high commendations, commendations, and frequently special commendations in every class. The new scheme gives certificates of two classes or grades. The great design (as I have always understood it) in the trials of implements is to test the respective merit of the various implements brought under trial; and the duty of the judges is to award to each the place, and position, and encouragement it deserves. Hence a first prize for one, a second for another, a third for another, according to their degrees of merit; then follows a high commendation perhaps in several cases, then a commendation in several others; or if anything richly deserves it, a special commendation for some particular adaptation, whilst those without any particular merit are passed unnoticed. No arrangement as to the awards of certificates can define or denote the merit of each implement better than the above; and I can see no advantage, save the economizing the society's funds. On the contrary, a considerable number of these certificates must be awarded to each well-contested class, or many highly deserving implements are unfairly discarded and disgraced; whilst, on the other hand, if an award of certificates is made to several, who is to judge which is considered to be the best? for they are placed too much upon a par with each other. The public expect the judges to test and bring out the merits of each implement; and then properly designate such by some graduated prize or token of merit, which they take to be their guide in making their purchases. Failing this, of what value are either prizes or certificates?

It is said that "the implement-makers do not want money prizes." I beg pardon—my experience is quite to the contrary. I believe all the "little men" prefer money prizes. It may be that some of Mr. Caldwell's "big men" would like an honourable certificate quite as well. I believe it. They have already such a long list of prizes to ornament and illustrate their advertising sheets—*i. e.*, of prizes obtained here, and obtained there, yes, in almost all parts of the world—that some little deviation from this stereotyped list would be pleasing; moreover, it would be new, and would also better suit our mechanical aristocracy—a sort of star-and-garter order, or blue-ribbon. Oh, no! They don't want your money—

"I write not for your farthing, but to try
How I your farthing writers can outvie."

But what is to be done with our "little men"? Depend upon it, our humble but meritorious mechanics—those men who have expended much of their slender means in bringing out a deserving implement—do not despise money-prizes. Besides, they do not believe in certificates. "Give me a prize which I can blaze abroad," say they, "that the world may know I've won." I have frequently been requested by exhibitors to change a

commendation for a prize, however small—the word “prize” being a sort of talisman to customers.

I think no one knows, but the actual judges, with what intense anxiety, for the most part, exhibitors contend for the prizes. I have seen many so agitated as to be unable properly to adjust their own implement or machine, and have had to do it for them. On the other hand, the precision, dexterity, and careful attention to every detail in others has been most admirable, and almost ensured success. The winning of a prize is the cause of great elation to many. “You have made my fortune,” says one; “It’s worth thousands to me,” says another. The telegraph, carrier-pigeons, and other quick and available means are resorted to, in order that “our people at home may know.” I have also been distressed to witness the despondency of other men, who have exhausted all their means to bring out and patent some novel invention of more than doubtful utility, trusting that the judges will award it a prize, and thus make a way for its sale or the disposal of its patent rights. I have known these fail, and the makers return home to be made bankrupts. These are important considerations to be taken into account; and from them I would argue the desirability of upholding a system that has grown up with the progress of our improvements, that has worked so admirably, that has brought out such a vast amount of talent and enterprise. I trust that no speculative alteration will retard the onward movement. What would our inventors of implements for steam cultivation have thought of a poor cer-

tificate of merit rather than the £500 prize? If I know John Bull aright, he does, and ever did, prefer to replenish his breeches-pocket. Small money prizes pay something, and is a consideration with many. What would the honest, hard-handed workman think of his certificate after spending months in bringing out a clever, useful implement? He looks for immediate benefit, and it is this hope of reward that has nerved him for the task. I have every confidence in our great society, and believe it will not lightly give up such a stimulus to inventors. I would much rather such prizes were doubled—not to benefit the established firms, and almost unconquerable, inimitable houses; but to bring out latent native talent of humble origin—some George Stevenson in agriculture, and the like in mechanics. I am a firm believer in the prize system. It works well, from the dame’s school to the highest collegiate honours; from the humble ploughboy to the princely exhibitor of cattle. It is thorough English. John Bull will do anything under encouragement of a cash stimulant. Let us, then, set our faces against any retrograde movement. British agriculture has attained its proud pre-eminence under the prize system; let us rather extend it to every benighted district, than curtail it in a single one.

[It must be clearly understood that the West of England Society will not give even a certificate of merit. There will be neither trials nor awards. Manufacturers may show off their wares in work if they please, but the Meeting itself will be merely an exhibition.—Ed. F. M.]

THE ROYAL AGRICULTURAL SOCIETY'S JOURNAL.

At this comparatively quiet season a number of the Society's *Journal* will be received with a far better welcome than it would command in the middle of harvest. One can picture a man then just breaking the cover, and throwing the goodly volume aside, perhaps never to return to it again. Now, however, with a long evening before him, he is almost certain to give the new number some attention. At a little after date there is one just ready to his hand, the general issue of which has taken place. This is in some respects a remarkable part; curious, in the first instance, as not containing a single prize paper. We miss, accordingly, the County Reports, which by this time are no doubt nearly exhausted. Still, any such omission must not be taken as altogether telling against the character of the contents. If there are no prize essays, there are the names of many writers who have distinguished themselves in this wise. Mr. Clare Sewell Read, for one, claims the opening article on the recent improvements in Norfolk Farming; Mr. Robert Smith reports on the exhibition of live stock at the Chester Meeting; Mr. Henry White has a similar paper on the Cheese Show; while Professor Vöelcker not only instructs us on the use of liquid manure, but has another and more attractive article on the composition and value of cotton cake. Then Mr. J. C. Morton estimates the cost of horse-power;

Professor Henfrey talks aptly on the structure of roots; and Messrs. Lawes and Gilbert detail some further experiments with different kinds of manures. All these gentlemen, if we recollect aright, have been successful competitors for the premiums of the Society. They are associated here with Sir Archibald Macdonald, who, as the senior steward, introduces the several reports from the judges of implements at Chester, and with Messrs. Ransomes and Sims, who supply some acceptable directions for working portable steam engines. In another division, Monsieur Trehonnais writes on horse labour in France; Mr. Herbert furnishes some statistics of the cattle sent for consumption to the metropolis; and Mr. Wright gives a very good essay on the management of a herd. It will be seen from this that the favours of the number are very nicely distributed, and that implements and stock have each alike proper consideration allowed them. Still there is no one *great* article; and useful as this issue will be found, it is as a whole by no means up to the high-water mark of some former parts. Amongst its more especial recommendations is the absence of any too long or too learned treatises—a mistake the conductors had latterly been rather prone to admit of. Indeed nearly all our quarterlies are more or less liable to the same charge; and a subject must

be more than usually smartly handled to ensure such laborious effusions being looked into. But too often they are never read at all.

By far the most readable paper in this number of the Royal Agricultural Society's work is Mr. Robert Smith's report on the Chester stock show. It is a long way the best thing of the kind the *Journal* has ever had, and quite a reference for future Stewards to turn to. But it is at the same time something more and something less than an actual report of the meeting. We have carefully-prepared tables, showing how the different breeds of animals have increased or declined in the entries at these anniversaries. We have passing notes—often enough but too brief and passing—of the merits of the winners on the Roodee in July last. The strength, however, of the paper—and wonderfully strong it is—lies in the introductions to the several sorts and classes now recognized in the prize sheet. Had Mr. Smith given equal time to the points of the individual animals he saw at Chester, as he has done to their histories and qualities, he must have produced a yet more valuable article. As it is, we never saw so much useful information better condensed. He has a few great facts to tell us of all the different breeds, be they cattle, sheep, or pigs; while of the origin and progress of some, we repeat, that he epitomises quite an interesting story. Take for example his opening to the short-horn classes, in which he traces them fairly back to the Teeswater, and comes on with them through the Collings, Masons, and Bates, up to the Booth blood, "now, by almost universal consent, recognized as the best tribe of short-horns in existence." He tells you what the bulls from this famous Warlaby herd are now letting for, and has a glance at all the great short-horn sales of the time. In fact, it is really quite fortunate that the paper of Mr. Smith and that of our Commissioner appeared simultaneously, or one might possibly have had the credit of taking his notions from the other. The senior steward treats equally well, but at less length, of the rise of the Hereford and Devon; while, perhaps, next to the Durhams his most interesting notes are on the early history of the Leicester and other long-woolled sheep. Mr. Smith, it must be borne in mind, has himself been a very successful breeder of cattle and more particularly of Leicester sheep, so that he speaks with higher authority on such matters than he even would as a steward of the yard. In his estimate of how the shorthorns stood at Chester, he has to refer to the injurious effects of an abuse we have ourselves long continued to complain of:—

"A review leads me to the opinion that, although the shorthorns have now become more the general stock of the country, and were shown in unusual numbers at Chester, they were not there superior to the best-bred animals that have been exhibited in former years. The young animals, especially the *males*, are not improving as they ought from such parentage as we have been accustomed to see at previous shows. *The high condition of the cow and heifer stock is unnatural and opposed to common sense. Are such animals really*

in a state for breeding and milking—one (at least) of the uses of the beast? It would be well if more attention were paid to the lean meat of a shorthorn, and less to superfluous fat. It would be better to err on this side with our first-class bulls rather than to encourage male animals of a smart heifer-like cast, without lean meat—'quality, with substance,' being really essential."

We have in other parts of this number some further confirmation of how the uses of the shorthorn are extending. Mr. Herbert, in his live-stock statistics, asks—

"What are the breeds of beasts and sheep which form the supplies exhibited in London? From a analysis of the stock exhibited during the past year, and founded on the most careful observation, we have arrived at the following conclusions:—

Per-Centage of Beasts shown in the Metropolitan Market in 1858.

Shorthorns	33 00
Herefords	9 25
Devons	5 00
Longhorns	1 00
Crosses	16 00
Highlanders	2 00
Poll'd Scots	4 00
Ayrshire	0 25
Irish crosses	8 00
Welsh runts	1 50
Irish	9 00
Bremer, Tonning, Dutch, and German ..	9 50
Spanish and Portuguese	1 50
	100 00

"The above table shows that the shorthorned breed of beasts now stands at the head of the list of stock for what may be termed general consumption. They have gone on progressing at a wonderful rate since the commencement of the present century, and they are now to be found in almost every county in England, as well as in Ireland and Scotland. We may further observe that half-bred beasts, between the Scots and shorthorns, have considerably increased within the last twenty years. The changes in the various breeds in this period have been remarkable. Whilst the shorthorns and crosses have increased, the Herefords, Devons, longhorns, and polled beasts have declined considerably. The same may be said of Welsh runts; but we find a great increase in Irish crosses, no doubt with the shorthorned breed imported from this country."

Mr. Wright, again, in his management of a herd, at once gives us to understand his own choice is the shorthorn, although honestly admitting, as he does, that his experience of them shows "they have less disposition to milk than feed." He has a word, too, for the manner in which the breed is so surely developing itself: "During last autumn I had an opportunity of inquiring of a gentleman, himself an extensive grazier in Australia, how far these high-priced animals repaid their spirited importers? He stated that they were highly profitable, as all trials of pure shorthorn bulls, or of crosses with them, had been attended with eminent success."

One does not care to be always complaining, but we certainly could wish these able reports had been backed

by equally-good prize-lists—a very easy matter to manage; at least, so one would imagine. It is impossible, however, to follow Mr. Smith's commentaries by the prize-sheets tacked on to this part. If, as he tells you, Mr. Booth's prize cow Nectarine Blossom was a "magnificent beast," Mr. Stratton's second prize "a good animal," and Mr. Wetherell's Moss Rose "highly commended," but that he thinks the age of the second prize cow "must have carried some weight,"

we naturally turn to see the relative ages of these animals. The first and second are to be found readily enough; but the third, or highly commended, with some difficulty—about fifteen pages further on, in a thorough jumble of cattle of all kinds, without even a break or a line to separate one sort from another, and, after going through sheep, pigs, and even poultry, to reach her. What can be the argument against some more orderly and convenient arrangement?

LONDON, OR CENTRAL FARMERS' CLUB.

ARTERIAL DRAINAGE.

The first monthly meeting of the Club for the present year took place on Monday, February 7, at the Club-house, Blackfriars. Mr. John Thomas, of Bletsoe, the new Chairman, presided, supported by Messrs. Robert Baker, Owen Wallis, J. J. Mechi, J. Tyler, W. Gray, James Howard, J. A. Williams, C. E. Amos, S. Skelton, H. Cheffins, G. Wilsher, E. Purser, E. B. Waite, M. Reynolds, W. Eve, W. Heard, J. Cressingham, S. Sidney, C. J. Brickwell, G. Smythies, J. G. King, J. B. Spearing, W. Bennett, R. Holmes, J. R. Dagg, S. W. Squier, J. Wood (Croydon), D. Christie, J. Coleman, D. Reid, C. Hayward, J. Bailey Denton, P. A. Halkett, Hammond, W. Banwell, G. S. Harrison, T. Haslam, G. Whistler, &c., &c.

The subject for discussion, introduced by Mr. J. A. Clarke, of Long Sutton, Lincolnshire, was "Arterial Drainage, including the state of our Rivers and Water-courses."

After a few introductory remarks from the Chairman,

MR. CLARKE said: Gentlemen, arterial or trunk drainage appears to have been asleep for several years, and we have had complaints of a scanty rain-fall that has left the soil comparatively uncharged with water; lowered our springs; made drink for cattle scarce in ponds, wells, and ditches; and kept the half-filled rivers pretty regularly within the brim of their wandering channels. But if we have not recently suffered from severe floods, which a wet season, however, would bring down upon us more disastrously than ever, the periodical overflow of some streams, the injuriously high level of others, and the inefficient and obstructed condition of thousands of brooks, drains, and water-courses intersecting the surface of the kingdom, are all the time working far greater evils than those which occasionally startle the public when a river happens to break loose and sweep away their property. The nature of these evils, to which through long custom we so quietly submit, will appear in the course of my paper. I will just say here that another kind of "inundation" seems threatening to make itself felt by the farmer more heavily than before; I mean the abundance of low-priced bread-corn: and I bring the subject of river reform before you, because I believe it to be one of those great measures of relief and means of profit which are now so urgently needed by the cultivator of the soil. When prices rule low, our

only resource lies either in a diminished expenditure or a greater produce, or indeed in both. At present, the agricultural mechanic is doing his part toward meeting the difficulty, by reducing steam tillage to a practical reality; and undoubtedly, if the tenant-farmer is left to fight the battle of the corn market single-handed, the steam-cultivator promises to be one of his ablest weapons. But we look to better subsoil drainage as one of the surest provisions "against a rainy day;" and here comes in the duty of the landed proprietor to render such an improvement possible upon his estate, with all its after-results of deep tillage and high management, by opening an adequate out-fall for any amount of drain-water. An unlooked for high range of prices has been only postponing the fulfilment of several great helps which the landowners and the legislature can rightfully give to the "unprotected" farmer. And among the coming questions affecting our welfare, such as Agricultural Statistics, a Tenant-Right Law, cheap Transfer of Land, alteration of the Law of Settlement, and so on, this one of our General Drainage is not the least important and momentous. You see I connect the subject with legislation, and after briefly adverting to the facts of the case, I propose to consider the necessity for Parliamentary interference, and to offer my views of the way in which that assistance may be conferred. To convey an idea of the extensiveness of the subject, I must be a little geographical. The drainage of our island passes off to sea in a generally eastern direction; the largest English rivers, except the Severn, emptying upon the low east coast, and those of Scotland (all but the Clyde) following the same course. Of English rivers, the principal points of delivery are the estuaries of the Humber, the Wash, the Thames, and the Severn; their respective drainage areas being very large. The Yorkshire Ouse, Trent, and other Humber rivers radiate into the counties of Westmoreland, Stafford, Warwick, Leicester, Derby, and Nottingham; traversing broad meadows throughout their course. The sluggish Wash rivers, the Ouse, Neve, Welland, &c., embrace in their system of flat valleys parts of Lincolnshire, Rutland, Leicestershire, Northamptonshire, Bedfordshire, Buckinghamshire, Huntingdonshire, Cambridgeshire, Suffolk, and Norfolk. The Thames and its feeders extend inland into Buckinghamshire, Oxfordshire, Gloucester-

shire, Wiltshire, Berkshire, Hampshire, besides Surrey, Middlesex, Kent, and Essex; fringed with peaty or more solid wet lands. The Severn, stretching inland through the counties of Gloucester, Worcester, and Salop, into Warwickshire, Staffordshire, and Montgomeryshire, with the Wye and other tributaries ramifying through the counties of Monmouth, Hereford, Radnor, and Brecknock, bring down the rapid floods from the Welsh mountains, and frequently deluge large tracts of the wide-spreading plains. In addition to these chief drains of the central counties, we have streams from the lake district, the Welsh high lands, and the southern, eastern, and northern provinces; aggregating into considerable estuaries round the coast-line, such as the Eden, Lune, Ribbles, Mersey, Dee, Conway, Towy, Taff, Usk, Avon, Parret, Taw, Tamar, Dart, Exe, Test, Arun, Rother, Stour, Medway, Crouch, Blackwater, Colne, Orwell, Yar, Tess, Wear, Tyne, and Tweed; not including an innumerable succession of outlets of more or less importance. These, with an immense network of channels branching from them, together with all the mill-streams and other accessories of the main arteries already named, form our natural drains for the whole of England and Wales. Now, Solomon says, "All the rivers run into the sea." But the grievance is that they don't; for whether or not the oriental streams with which the wise king was familiar may have all overflowed at intervals like the Nile and Jordan, it is certain that English fresh waters at the present day seem inclined to linger in the valleys and repose on the meadows, or wander anywhere rather than roll straight down to the ocean. In some cases the outfalls, or river-mouths, are in a defective state; but, generally speaking, the exigencies of their alluvial deltas or estuary marshes have caused them to be to a considerable extent opened, embanked, and watchfully preserved. Thus, great outfall works have been executed on the river Dee, below Chester; in Somersetshire, at the mouth of the Parret and its connected rivers; in several harbours and estuaries along the shingly coast of the Channel; in East Norfolk; in the estuaries of the Ouse, Nene, and other Wash rivers; and in the streams converging to the Humber: while in Scotland we have the example of the Clyde improvements; and, again, the similar dredging of a deep channel for the Tay. But many great alterations and improvements yet remain to be carried out. However, it is the inland course of the streams that principally calls for amelioration. These natural arteries are employed for every purpose that water is good for, and the water is thus detained for such uses, in spite of drainage necessities, instead of being conducted speedily to the sea. They are dammed into reservoirs, intercepted for canals, especially in the central, northern, and western counties; and besides being neglected and choked with weeds or with osiers, or obstructed by strangulating bridges, innumerable brooks and rivulets are suffering from the diphtheria of a water-mill, or a succession of mill-wheels appropriating the whole descent of the stream. Sometimes, hundreds of acres of meadow are ruined by the picturesque dilapidations of a mill mentioned in Domesday, or by

the pounding of the water for the sake of a few baskets of fish. Not that there is any objection to the employment of running water as a motive power, or a means of transport, or a supply for towns, as an ornament in a park, or for the refreshing of a meadow; provided that damage of greater consequence is not inflicted upon any interest, and that there is an amply capacious channel for the outlet of the heaviest downfall, without overflow and without injury to lands by the prevention of the best husbandry. How many among the myriad water-courses of our country are all that can be desired in this respect, I cannot undertake to say; but the following record of actual disaster—to say nothing at present of the still greater mischief of good culture prevented—shows the prevalence of defective and ill-managed rivers. Take a few cases of violent inundation from the precipitous western districts. In 1845, Cumberland and Westmorland, where every year heavy losses are suffered from the suddenly descending mountain-streams, experienced a series of terrific floods. From only two days of a tremendous rain in October (the beginning of the wet season), all the rivers were swollen and overflowed. The Eden, Lowther, Ramont, Lune, and Petteril destroyed a large amount of property: thousands of pounds value of railway-bridge scaffolding, timber, and materials were carried away; hundreds of stooks of corn were swept out of the fields; the uncut crops washed flat upon the ground, and the corn-mills on the rivers stopped by the flood. Again, in July 1852, the river in Kendal swelled from a thunderstorm, overflowed the streets, washing out the tan-pits, bearing away everything loose in its current. In the neighbourhood, bridges were swept away, the soil was completely washed away from the potato-plots, and "a whole fleet of hay-cocks was seen sailing down the Kent," and the rushing of numerous gills and becks inflicted similar damages in many towns and valleys. In December of the same year the floods were severely felt throughout North Wales. At Carnarvon the Cadnant river, bursting its banks, destroyed much property; and the estuaries of the Seiont and Gwysfai, which flow from the Llanberis and Cwellyn lakes, overflowed, demolishing a bridge, and covering a considerable breadth of flat land with water. In South Wales the valley of the Towy and vicinity of Carmarthen suffered from an extraordinary inundation in the winter of 1847-8. Again, in 1852, great disasters occurred in various counties, particularly to railway and other bridges; but the storm floods of July, 1853, wrought an immense amount of destruction. At Cwm Neath no less than seven bridges were swept away. The Taff ravaged the upper part of Brecknockshire, and the adjoining vale of Neath. Brecon town was flooded and filled with mud, and many of the houses completely gutted. A villa near Bwlth, with five inmates, was carried away, and the whole district was swept clear of hay, potatoes, and all moveable articles. The rivers Nedd Vechan and Melte bore away their bridges, and devastated corn fields and meadows. The Neath inundated various farms, clearing off the hay and drowning the cattle, while the farmers barely escaped with their lives. At Lougharne, wheat as well as hay crops were greatly

damaged. The district of Marras Pendine and Amroth was completely overflowed, and a great number of houses inundated, the inhabitants escaping through the windows and roofs. The water carried before it bridges, culverts, hay-ricks, and everything which stood in its way. The expanded inundations of the broad-flowing Severn cover a very great tract, and its tributary streams commit a more ruthless order of depredations between their spring and junction. The worst floodings in 1848 were those of the Severn, the Wye, and Warwickshire Avon; the chief places being at Hereford, Pershore, Evesham, and Stratford. In February, 1852, the Severn and Wye rose to an alarming height; the former river, at Gloucester and Tewkesbury, rising in one hour 18 inches upon the meadows. The lower part of the city of Hereford was so flooded by the Wye, that the inhabitants were driven to their upper rooms, and ferry-boats were established in the streets. In September of the same year, the counties of Worcester, Gloucester, and Hereford were visited by a tremendous tempest; in consequence of which the Severn rose at Worcester, in one night, from its low summer level, so that its banks were overflowed, and its surface covered with uprooted trees and crops, furniture, and drowned animals. In the valley of the Teme, which river came down with a "head" similar to the "bore," or tidal phenomenon on the Severn, the number of sheep washed away in the parish of Powick alone was 2,900, and some carcasses of the cattle were drifted into the Bristol Channel. Great damage was done to the grain and meal in the various mills. At Henwick mill, a rick of hay of about 12 tons was bodily moved by the flood. The hop-yards, which abound in the Teme valley, suffered greatly; at one hop-yard, near Shelsley, poles and hops were washed into the stream; several houses, and many gardens and roadways were destroyed; and at Stonebridge, the Leigh brook, rising 20 feet above its ordinary level, demolished a house, drowning its inmates, and scattering it in fragments over the neighbourhood. The river Froome overflowed its banks at many points; and numerous smaller streams, accumulating into rivers, broke their embankments, flooding hundreds of acres; and the Hereford and Gloucester mail, together with one of the passengers, was lost in the Froome, near Dormington. *All the Vale of Gloucester*, comprising a vast flat district on each side of the Severn, was one wide-spreading sea, the water covering the fences, leaving only the tops of the trees visible. The parishes of Sandhurst, Longney, Elmore, and other villages near the river, were completely deserted, the inhabitants having fled to more elevated country. In some localities the houses were completely submerged, only the chimneys remaining visible. At Gloucester, the dock warehouses, and even one of the churches, were inundated; and the city was three nights in darkness, owing to the flooding of the gas-works. At Tewkesbury, boats were employed to rescue the inhabitants. At Shrewsbury, the abbey church, and nearly *eight hundred houses*, were under water; and the deluge extended for several miles over the surrounding country. In December, the Severn, hardly subsided, again rose; the houses in Shrewsbury again suffered, and the meadows for many

miles were flooded to the depth of several feet—so that in many places along the Shrewsbury and Chester, and also on the Shropshire Union, and Shrewsbury and Birmingham railways, as far as the eye can reach, the land was completely drowned, to the vast damage of seeds and plants then in the ground. The almost unprecedented fall of rain during the latter end of 1852 produced similar disasters in the south-western counties. At Bath, the river Avon overflowed, the water reaching 10 feet above the ordinary level, and inundating a great many houses, the inhabitants taking refuge in their upper apartments, and receiving supplies of food by boats. In the neighbourhood of Bristol an immense amount of property was destroyed. The central basin of Somersetshire, or the marshes and moors about the rivers Parret, Axe, and Brue, between Bridgewater, Wells, and Glastonbury, were completely under water, rendering all traffic wholly impossible. The meadows around Taunton were flooded: and at Langport and upon Sedgmoor, the water accumulated to a disastrous depth and extent, to the heavy loss of the graziers and farmers of that rich pasturing district. In Devonshire, the river Leman and Teign, at Newton Abbot and other places; and in Cornwall, the river Camel, near Bodmin, flooded their contiguous lands with great damage. Few districts are more afflicted by inundations than the valley of the Thames. In 1846 *all the low lands for miles above and below Windsor-bridge were flooded several feet in depth*; and a great portion of the Home Park of the Castle was completely under water. Again in 1847, and again in 1848, many thousands of acres in the same neighbourhood were overflowed by the Thames and the Kennett. In July, 1852, similar floodings occurred, the hayfields between Swindon and Chippenham being indicated only by the appearance of scattered haymaking machines and other implements. In November and December of the same year, the valley from Vauxhall to Windsor was a vast lake. *Oxford was standing in a sea of water*, the Cherwell and Isis being miles in width, a vast amount of cattle and agricultural produce being carried away from the vicinity, and several lives lost. It was computed that 6,000 acres on the Oxfordshire side of the Thames were under water from September, 1852, to February, 1853. At Maidenhead, Reading, Ealing, Uxbridge, and many other places, *the principal corn-fields were overspread with several feet of water*, and the number of houses inundated was enormous. At Farringdon, the sheet of water was of amazing extent; and at Cricklade, Lechlade, and other places, *the farms were under water*, heavy losses inflicted, and great numbers of families reduced to starvation. The Thame is in so choked a condition, that there have been 17 floods in twelve months, and a third of the hay harvest of 1853 was washed away. Much land in Epsom, Dartford, Lewisham, and Charlton, was overflowed in 1852. On the North Kent Railway, the valley of the Medway and the marshes along the Thames were one expanse of water for miles. Parts of Chatham, Rochester, and Strood were also flooded. The damage to property and to *health* in the suburbs of the metropolis was beyond estimation. After the excessive rains of July, 1853, the

low lands on the South-Western Railway were over-spread with water and thousands of floating hay-cocks; at Guildford, Chertsey, Woking, and Battersea, the flood was several feet deep; Windsor and Reading suffered as usual. At Newbury, Sonning, Burghfield, Oxford, &c., &c., many hundreds of acres of meadow were cleared of their hay; *wheat, barley, and oat crops were flattened and spoiled*; and at Banbury, for miles on the eastern side, the country was entirely deluged. Taking the Midland districts, we find that in the winter of 1848, the Avon, Welland, Ouse, Leam, and Soar, all overflowed their banks, committing innumerable depredations and great inconvenience at Newton, Clifton, Market-Harborough, Daventry, Leicester, Coventry, and Leamington. In the following winter, the flood which periodically encompasses a great portion of the Midland Railway rose with un-wonted severity, so that the whole country from the source of the Trent to its junction with the Humber became *one vast inland sea, more than 150 miles in length, and occasionally spreading for miles on either side*; and on the margin of its smaller tributaries in Derbyshire, Leicestershire, Staffordshire, and Nottinghamshire, the same inundations were found to spread themselves. In the winter of 1852, the Trent and Soar converted the valleys around Nottingham and Leicester into sheets of water, and parts of the railways at Loughborough, Crow-mills, and Stamford were carried away. At Birmingham, the river Rea caused an alarming flood, covering the country with water, destroying a great amount of property, and stopping the machinery of various manufactories. The Leen and Erewash, the Derwent, and other streams, also overflowed; and besides the damage done to so many towns by their streets being inundated, the corn sown over large districts was seriously damaged, and hay in the following summer was rendered scarce throughout the Midland counties. In the winters of 1848-9 and 1852, the valley of the Nene, between Northampton and Peterborough, suffered from extraordinary floods; and again in the summer of 1853. In the latter season, too, the Ouse overflowing swept away many sheep, and rendered the hay crops nearly valueless, particularly in the vicinity of Buckingham. Manchester, Rochdale, the West-Riding of Yorkshire, between Goole and Selby, and Doncaster, and along the banks of the chief rivers, were localities heavily visited by the floods of those years. Farther north, the valley of the Tyne, the neighbourhood of Darlington, the vale of Pickering, and some other districts, were inundated. In the Eastern counties the Ouse and Nene periodically deluge broad tracts of meadow, and often arable land; the Fen Level often greatly suffering from the breaking of its embankments by the excessive hydrostatic pressure of the swollen hill freshes. Then the Essex valleys are in a most deplorable plight. During the summer floods of 1853, immense injury was done there to sheep and lambs, to hay and corn crops. The vicinity of Chelmsford was completely deluged with one wide expanse of water. Many hundreds of acres of hay were destroyed, thousands of hay-cocks floating down the rivers, a hundred per hour passing through Box-mill flood-gate, near Halstead.

Taking the course of the river through the Yeldhams, the Hedinghams, and the northern part of Halstead meadows, the aggregate amount of grass and hay floating down this one stream must have been at least 50 tons. Along the banks of the Stour and Colne, hundreds of acres of meadow were entirely drowned, and hundreds of tons of the transported hay lay embedded in the river, impeding the current and choking up the numerous mill-wheels and flood-gates. Great calamities were experienced in many other localities; an entire field of flax was floated away near Writtle; and in Baddow Mead Hundred the damage to the wheat crop was estimated at a sack per acre. These items, picked up by my own observation, or gleaned from newspapers of the period, do not comprise anything like complete details of damage done by half the flooding streams of our country; and you perceive that the marsh and fen districts situated at various parts of the coast around our island, but chiefly in the Great Level surrounding the Wash, have not been mentioned at all. In fact, being constructed and conserved upon system, under companies or local acts, with drainage taxes to defray the cost of the works, the Fen rivers do not overflow their margins; and when a deluge does take place, it is from the failure of some embankment or other artificial erection. However, were an action brought against the English streams to recover the value of even what I have enumerated as losses experienced by all the various interests and classes in town and country—manufacturers, millers, agriculturists, landowners, and the community at large—the sum would amount to an immensely heavy figure. But I have not made out half the strength of the case against these incontinent rivers. There are greater evils than those arising from the occasional or frequent destruction of produce and property by violent inundation. And it is only because we have been for ages accustomed to have our valleys wet with sodden meadows, and spacious districts of flat arable land cultivated with the very *shallowest* ideas of infiltration and aëration as means of fertility, that we do not hear louder complaints and demands than those which are forced out by some unusual deluge. To be sure, we have articles in newspapers and reviews setting forth the damage to property and danger to public health incurred by the present condition of our arterial drainage. The Royal Agricultural Society's county "Reports" notice the necessity for amelioration; active under-drainers and improving farmers perceive the impossibility of carrying out first-class husbandry without better outlets for the rapidly-increasing amount of water to be discharged. But the reason why there is not a more wide-spread agitation and appeal to the Legislature, may be because the great body of those who directly or indirectly suffer are looking upon amendment as almost hopeless from its cost and from the apathy or conflicting views of different interests concerned. I have not time to illustrate the various kinds of injury permanently and perpetually caused by defective brooks and rivers: but take some of them. That the bulk of coarse hay furnished by marginal meadows, without asking any return of manure, does render them of considerable value to the upland farms with which they are commonly associated, is perfectly true; but it is also the fact that

this value is hazardous and precarious, owing to the capricious irrigation or sedimentary manuring of the stream that may serve as your Nile; so that if one year you get a fair pasture, in another it is too watery to be grazed. If for one or more years (according to locality) your hay-harvest is successful, the next season utterly spoils your crop, leaving also a gritty aftermath that stock cannot relish. The farmers in the Trent valley, by the Ouse, Nene, Thames, or Severn, in the rainiest as well as the drier counties, are pretty well agreed in declaring that while the small winter floods compensate for any damage they may do by the cheap manure they leave behind, the great floods of wet seasons inflict very heavy injury by hanging upon the land. And, in their view, no doubt it would be a famous thing if by some tolerably cheap improvement the channels could be made of just that happy dimension and capacity which would overflow every winter with shallow and not long-continued floodings, yet convey speedily off the waters of any heavier or sudden summer downfall. Such good-natured and elastic river courses as these may not be attainable; but in many cases the fitful streams might be made to water the contiguous meadows properly, instead of stagnating to a great depth upon the surface, and so produce a finer quality and richer abundance of either herbage or hay. Occasionally may be found a reach of meadow liable only to slight floodings, and having a gravelly porous subsoil; and the luxuriance of the grass in such a situation indicates what might be obtained on many other drowned lands with a well-managed overflow and proper drainage. But why are our large water-courses so generally bordered with meadow and pasture? Not because the soil itself is specially adapted for grass-bearing; not because of fine fattening property in the herbage, or its peculiar healthiness for sheep or cattle; not because rich cheeses or a great amount of other dairy produce can be made there. No; these low moist grounds are mown and grazed simply because of their over-wetness for tillage and their insecurity from the ravages of inundation. Under present circumstances, in fact, this is the cheapest way of making use of them. But, with the exception of some tracts which with good drainage would make excellent grazing land, and others which might be converted into real and profitable catch-meadow, a large proportion of the grass is naturally poor, and the land would be far more valuable if dried and turned under the plough. There are numerous examples of such lands lying barely three feet above the water level, which when pierced and tapped with underdrains, and cultivated and cropped, have yielded in one year more vegetable food than during many past years of haying and grazing. The Bedford Level farmers once maintained that they should be ruined without their wonted winter floods, because their weak lands, under natural sward or laid down for years with grass-seeds, needed continual moisture; but at the present day they ridicule the idea of merely making the best of a bad situation: instead of that, they have altered the situation; and having dismissed the floods, they soon opened up a more profitable order of culture; and when you look at their immense wheat harvests and their magnificent crops of sheep-fed succulent colesseed,

you acknowledge at once how superior is the present productive arable to the once-famous pasture and hay. I consider that somewhat similar results would follow the effectual drainage of our river valleys; and thus, while the defective streams are injuring some grounds that might become good water-meadow, in the far greater number of instances they prevent fertile lands from being managed either as good arable or pasture. Then there is a very large extent of land not subject to actual inundation, but which lying immediately adjacent to the drowned flats, and delivering its drain-water upon them, is incapable of efficient subsoil drainage (with all the good farming dependent upon it), because the floods dam back the outflow from the main ditches, overriding the outlets of the underdrains just at that season when their rapid emission is most required. But the evil effects of river-floods are not only agricultural; for, in the neighbourhood of towns, just where the meadows may be rented as "accommodation land" at £2 or £3 or more per acre (and the proprietors might therefore doubt the advantage of drying them), sanitary considerations demand our care. Every man thinks his own home peculiarly healthy, until the Registrar-General dispels the pleasing illusion, and the tabular statistics of public health prove most undeniably that districts abutting upon a flooding river, or intersected with marshy hollows and choked rivulets, are above all others (excepting crowded and filthy cities) the haunts of fever and glandular disease. Thus Northampton, on the sluggish Nene, which overtops its banks, held up as a navigation and pounded back by mill after mill along its winding course, is shown by the "returns" to be one of the few most deadly places in England; and typhoid and milder but enfeebling maladies constantly visit the villages that inhale the hot-weather malaria of the swampy meadows. The Ouse has a like unhealthy character, as shown by the excessive rate of mortality in Buckinghamshire, Huntingdonshire, &c.; and, indeed, so have all our gloomy and lifeless rivers, as exemplified at Norwich, surrounded by the heavily-flowing Wensum and Yare—at Colchester, on the dull and tardy Colne—at Salisbury and the fashionable Bath, on the inactive and cheerless Avon; and the smaller towns and parishes flanking the streams are the hotbeds of intermittent fever, rheumatic and liver complaints, and scrofulous and pulmonary disorders, aggravated if not originated by the cold damps and poisonous exhalations from which the inhabitants have no means of escape. Trunk drainage, however, would prove a marvellous preventive. I am informed that at the village of Cople, in Bedfordshire, the Duke of Bedford cut a deep brook which relieved the parish of stagnant water, and although up to that time typhus fever was rarely out of the parish, only a single case has since happened in a period of eight years. The Duke is cutting a deep brook or drain, at the present time, through the adjoining parish; and in that county, as well as in others, many landlords might employ the surplus labour in straightening their watercourses, exchanging angles of land where necessary, and save or reclaim ground enough to pay all the expense. I have now alluded to the four great mischiefs arising from the defective state of our rivers and watercourses—namely,

actual damages by deluge—the prevention of agricultural improvement in the immediate vicinity of the streams—the injuries sustained by the lands situated above the reach of floods, but suffering from obstructions to their drainage—and the calamitous influence of the reeking and pestilential valleys upon the lives of a great proportion of our population. Were I to enter upon a consideration of the various obstacles causing the damage, the nature of the new works or enlargements required, and the means by which opposing interests may be reconciled or compensated, and the burden of the improvement equitably apportioned according to advantages conferred, my paper would be prolonged far beyond any reasonable limits. One of the most general impediments is the utilization of a stream for water-power; and, as Captain Blithe said two centuries ago, “mills drown and boggify more gallant land than themselves are worth to the commonwealth.” Thus, the upper valley of the Nene has thirty-three mills in a length of sixty miles; the river Welland, between Market Deeping and Market Harborough, is much obstructed by flour-mills; and upon a small stream in Dorsetshire there are no fewer than five mills within a total distance of four miles. The escape-weirs are generally inadequate to the discharge of the excess of downfall, which therefore over-spreads the low lands; and, besides this, the water-level is often held up for the purpose of navigation. As I have before said, no single method of improvement will apply to all districts: in one case, a small breadth of land injured may not be half so valuable as the mill or factory causing the mischief; in another, it may be possible to purchase and abolish a long line of mills, and set the waters free. In one valley you may accomplish the same end cheaply by substituting steam for water power, with a compensation for the greater expensiveness of this motive-power, or by building windmills instead; in another, you may have the assistance of the millers, and provide their wheels with a more copious and regular supply. In one case there may be a canal company to treat with for total removal; in another, you may unite a better navigation with securer drainage. In one instance there may not be a sufficient area of land to warrant a complete measure, and you must be satisfied with an improved regulation of the irrigating waters; in another, half measures would defeat the object in view, and there may be ample means in the town and country interests combined, to relieve from all possibility of flood and give a deep outfall to the hitherto soaked and burtful lands. As a fine example of what a district may accomplish in arterial drainage, I may refer you to a description of the “Rye and Derwent Drainage” in Yorkshire, given in the *Royal Agricultural Society's Journal* of 1853. In this case, under a local act of parliament, 27,000 acres were charged for the improvement; and £20,000, out of the £30,000 raised, was paid to the three mills for their adoption of steam instead of water power. The pecuniary advantages of the works are apparent, from the fact that a single flood, such as frequently overflowed the land, has been known to do more damage, if fairly valued in money, than the whole sum expended under the act. For de-

tails of the present Nene Valley improvement—now, unfortunately, in a stagnat plight, the causes of which may be traced to great errors committed in times gone by—I may refer you to an “Essay on Trunk Drainage,” written by myself, in the Society's “Journal” for 1854. In this case only one out of a long succession of mills is to be removed, and the water-power of the remainder increased; the navigation is to be benefited, 20,000 acres made secure from their present frequent floods, 7,000 acres more provided with a better outfall, and Wisbech harbour improved. As long as English communities will permit typhus, and cholera, and all sorts of virulent diseases to decimate them at will, without taking resolute measures in town sewerage and water supply, they can scarcely be expected to awake from their apathy with respect to river devastation and injury; and, in all probability, we shall reiterate in vain the statements of calamity and needless disadvantage to which they passively submit, as if the condition of things they were born to admitted of no progress or relief. But it is certain that the question of arterial drainage is slowly advancing: the rivers grow worse and worse; the improving drainage of the upper country sends down increasing volumes of water; and even the millers are complaining, not because the more water the more power, but because it comes down so quickly (a heavy downfall raising the level of brooks and rivers in half the time formerly taken), and passing by them over their weirs, is thus lost; instead of remaining stored up in the districts above, to be forwarded by convenient instalments, like the waters of streams regulated and equalized by lakes out of which they flow. From Mr. Bailey Denton's admirable and reliable estimate of the proportion of drainable land in England, which has yet been drained, we learn that, after all these years of preaching and practice, of Government laws and land-drainage companies, pipe and tile-machines, and the steam draining-plough, not two-thirds or three-quarters, no, *only one-sixteenth* has been permanently subsoil-drained. Add to this, if you like, a similar extent of temporary drainage, and still there is only a fractional part of our drainable lands thus improved. And if subsoil-drainage has already affected the main arteries to such an extent, what will be the consequence to them of drainage carried on to five or ten times the present amount? Then consider what a large proportion of the heavy winter rainfalls, absorbed in undrained soil as in a sponge, and evaporated during the summer months, is at once carried away and discharged by under-drains. For instance, on the Huxworth estate, in January and February, a thousand gallons per acre per diem were discharged, which without under-drains, would have remained to be dissipated by the dry winds and warming sun of spring; and you will thus have an idea of the additional quantity of water that has yet to be sent down into the natural watercourses of the country. As agricultural improvement extends—and drainage is sure to proceed vigorously as a resort against low prices—it is clear that the river-valleys will feel a greater pressure every year; and there is therefore more hope of all parties joining to open a commensurate passage for our drain-water, and to guard against both the insidious injury and sudden catastrophes of floods. Now comes the question, By whom are the desired improvements to be effected? Well, the cost ought of course to be defrayed by the district benefited; and those who pay their money should, according to English usage, have the control of it. But by what organization or under what authority are the works to be undertaken and maintained? That a universal issuing of Sewers commissions under the Great Seal would an-

swer the purpose, we cannot for a moment believe, seeing that navigations continue to pen-up our streams, to float barges over shoals, bridges contract their channels, and mills dam back our drain-water, in spite of sewers "presentments" of the evils, or of their decrees fixing the legal "heads" and falls. They cannot touch half the small drains which unneighbourly neighbours will not cleanse for us; still less provide the additional water-way demanded by annually augmenting delivery; and still less could they deal with mill-dams or ancient canals. The power of a local act of parliament is the authority upon which all our modern fen drainages, our harbour and outfall works, our internal river improvements, and many enclosures of salt-marsh from the sea are at present effected. But so many difficulties are connected with the procuring of local acts, that, if this is to remain the only course open to us, it is pretty certain that hundreds of flooded valleys will continue in a hopeless plight. The voluntary initiation of relief measures, the getting up of an agitation, and the carrying of an act of parliament for a larger or smaller district, when no organization and no court of appeal previously exists, requires a boldness and independence of mind, a degree of enterprise, and a harassing and expensive series of preliminary proceedings, which not only deter proprietors from attempting to combine, but place the subject of river-improvement beyond their thought as chimerical or incapable of realization; and the expense is often enormous. I cannot ascertain what has been the united cost of the acts of parliament for our numerous Fen-drainings, but I have no doubt that, if we could add together the sums expended in the mere obtaining of the acts for all the piece-meal estuary works, embanking, sluice-building, digging new cuts, or scouring and enlarging old ones, we should find an amount wasted that might have completed a large portion of the work. In the case of the Eau-brink cut, on the Ouse above Lynn, the first act, in 1795, contemplated an outlay of £10,000; yet, owing to a heavy and obstinate contest, the promoters alone had to spend £12,000 in merely carrying the bill. In the estimated cost of the Nene Valley drainage, which was to come to £275,000 altogether, the expense of the act of parliament was set down as £10,000 to begin with. But, as in the Bedford Level and other lowland tracts, vast works comprehending very extensive districts have been carried out, maintained, and improved by companies and corporate bodies acting under parliamentary authority, so I believe one general Act embracing the whole kingdom may enable river-reform to be instituted on a great scale without any necessity for a local act in each separate case. We have a grand example in the late arterial drainages of Ireland. I have not time to describe them; but they exhibit a boldness of conception and vigour of execution which place them among the most extraordinary series of engineering works ever undertaken. Independently of the surveys and reports made of 452 districts, works were carried out in 122 districts, extending into nearly every county in Ireland; relieving the lands of 3,100 proprietors, opening up and improving very extensive lines of inland navigation, increasing mill-power, and ameliorating the climate and sanitary condition of large tracts of country. They include nearly 1,800 miles of river-course opened and new cuts excavated, at an average cost of only £800 per mile; besides the construction of weirs, locks, sluices, removing mills, blasting rocks, embanking salt marshes, tapping bogs, &c.; the total outlay being about £2,000,000. About 192,000 acres, including some of the finest alluvial lands, were relieved of floods; while most important works have been executed towards the improved drainage of 140,000 acres more; carrying off the waters from catchment basins having an area of 7,000,000 acres, or 11,000 square miles; more than one-third of the entire surface of Ire-

land. This is a scale of operations (I may say, in the words of a competent witness) "without a parallel in Europe; having been effected, for the most part, in the short space of ten years, and mainly by the energy of one individual," Mr. Mulvany, the drainage commissioner. The chief of the works were undertaken to find employment for the wretched population during the famine; both their design and execution proceeded from the board and its engineers; and the blue-books contain abundant testimony to the effective and valuable character of the improvements; though, of course, out-fall works are not followed in every case by immediate results, but are profitable from the facilities supplied for better husbandry. Now, observe that these undertakings were not burdened with the expense of local acts—the parliamentary authority consisting of Government acts; so that the law-costs, even during the progress of the operations, such as juries, suits, arbitrations, registry, and expenses of that kind (which in public works in our own country swallow up so much money), scarcely exceeded £1,000 for the whole 122 drainages; because the direct legal business of all kinds was done by the solicitor of the Board of Works, and his clerks, for their salary, without additional charge; while the central establishment, consisting of the commissioner, secretary, accountant, clerks, draughtsmen, and computers, were paid by the Government and not charged to the works. If each district had been obliged to procure an act for itself, of which the law-costs alone would have been, say £500 each, there would have been many tens of thousands of pounds added to the total outlay. It is a difficult matter to obtain data on which to ground an accurate comparison between the cost of passing local acts in England, and of the preliminary proceedings taken under the powers of general acts, such as the existing Inclosure, Exchange, and Improvement of Land Acts, or a proposed General Drainage Act; for the facts as to the expense of local acts are within the knowledge of parties who may not feel disposed to give the information. But the difference must be considerable, as a very slight acquaintance with parliamentary proceedings will suffice to inform us that £800 to £1,000 is a very small sum to expend in carrying a private bill through parliament, even if unopposed; whereas the proceedings of the Inclosure Commission furnish us with an agreeable contrast of expenses under a general act. By the Annual Report of the Commissioners, presented to the Secretary of State for the Home Department on the 31st of January, 1853, I find that the cost of the preliminary proceedings in the twenty-two cases of inclosures therein recommended for the authorisation of the legislature, amounted to £365 7s. 3d., being an average of only £16 12s. 2d. for each inclosure; yet there was an average of 277 acres each case, or 6,092 acres altogether. The act of parliament authorising these twenty-two inclosures (an annual act being passed for giving the necessary authority), is obtained entirely without charge to the parties interested in the inclosures to which it relates, and is a curiosity to some of us from its containing no un-necessary verbiage, the enactment, following a short preamble, being merely in these words: "That the said several proposed inclosures mentioned in the schedule to this act be proceeded with." The preliminary proceedings under a general drainage act, such as I shall presently refer to, would be of the same nature as those under the Inclosure Acts; the expenses a little exceeding those above quoted. Consider how the facilities provided by the machinery of a general act might hasten our long-deferred river-improvement. After all, the real reason why our valleys are over-watered and unhealthy is to be found in the low state of drainage-opinion throughout the country; indeed, those of us who are familiar with level districts naturally possessing "a fall" of many feet, and yet careless about the state of internal ditches, so long as the water keeps below the open grips which gridiron the surface across ridge and water-furrow, do not wonder at the amazing degree of resignation manifested by the flooded inhabitants of our inland river-valleys. As the clay-land farmer will still plough his four-inch furrow, either unconscious of the wealthy subsoil beneath, or not daring to speculate in an expensive deep-culture without security of tenure to ensure him

the fruits; so these people continue mowing heavy hay-crops or grazing good grass, by help of the waters they bathed in or skated on when children, and never dream of greater profit if the floods were assuaged, or of salubrity with less expanse of cold water and offensive mud; or if they anticipate such improvement, cannot risk anything upon the chance feasibility of confining the streams and achieving a perfect drainage. Now a general act, partitioning the kingdom into districts or drainage departments, and establishing an organization for superintending the outflow of our waters, would create (as it were) a public opinion on the subject, by offering machinery for comprehensive or isolated improvement to the attention of owners, tenants, and townsmen. In these days of profuse advertisement, we do not conceal our wares until customers spontaneously inquire if we have them: to dispose of our goods we must "push" the trade; and instead of waiting for new wants to arise, must make those wants by offering to supply them. So would a general drainage act operate: by providing the remedy, it would stimulate the spirit of improvement in districts now blind to the misery of their state because ignorant of the advantages they might enjoy. In Ireland, numerous as are the "works" undertaken, they only amounted to a fourth of those applied for. What would be the nature of the proceedings under a general act? The Irish drainage were executed by the Government Commissioners, under the following regulations: Any one or more persons interested in a district memorialized the Board, engaging to defray the cost of preliminary proceedings if the work did not go on: the Board then made inquiry, a survey, and report, which was submitted to a meeting of the proprietors; and if the owners of one-half the extent of land in the proposed district (with the consent of tenants under lease) gave in their assents, the drainage was proceeded with, and where one individual possessed more than half the number of acres the other owners could outweigh his decision. The expense was charged upon the lauds of all the proprietors in proportion to the benefit considered by a valuator to be conferred on each part. Much of the money for these works was obtained by private loans on the security of the lands to be drained, for which debentures were issued; but the principal funds were advanced by the Treasury, to be repaid by instalments in 12 up to 40 years. But in our own country a very different style of procedure would probably be adopted, in order to be palatable to a people accustomed to regard local self government as the bulwark of their political freedom. We never could submit to have the Government engineer offering us a scheme of improvement with the alternative of "this or none." It appears to my mind that a general act for this kingdom should apportion the whole surface (as I have before said) into drainage districts; each including a main river or water-course, with all its branches and feeding ditches from the outfall to the very source—being, in fact, the entire catchment basin of the stream. And this because each river system is independent of all others; while its separate divisions, whether in the estuary delta, the upper valley, or the thousand feeders along its course, are mutually affected by and dependent upon each other. Not that all rights and responsibilities upon the river are to be swamped and set aside; but a jurisdiction is to be established over all. To conserve and improve the drainage of a district, to regulate all matters concerning mill-power, irrigation, or inland navigation, let there be trustees or commissioners; either a representative body, or sort of water-parliament, elected by all the different interests, or constituted in a different manner, if this were considered objectionable or unlikely to answer the end in view. Proper officers might be appointed to watch over and examine every portion of the tract, from the tidal harbour to the farm ditch, through which may run a right of water-way; and a model for such duties may be found in our fen drainage management. The district could devise, support, or oppose any scheme of improvement as at present; and there would exist an organization for submitting proposals to the direct sanction or rejection of all parties concerned. The advantage of the general act would be in its provisions empowering the district board (however constituted) to deal with mills, properties, &c., and rate the charge for outlay, &c., according to fixed principles laid down for different cases, thus obviating the necessity for the host of local acts that would otherwise be necessary for draining the kingdom, and which, because of their very number, will never be obtained. This is merely thrown out by way of collateral suggestion; but that a general act of some description is re-

quisite, I most firmly believe. It is evident that general rules for compensation, &c., could be framed, after due investigation of the existing state of things throughout the country, because our rivers are capable of being classified, according as they subserve the purposes of flour-mills or factories, navigation or simple drainage, and so on; and the remedial measures will be similar in certain descriptions of cases: as where water-mills must be removed, or steam-power provided in place of the water, or the water-power itself increased; where navigation must be abandoned, or, on the other hand, may be combined with better drainage; and so on. And there is already a sufficient number of precedents of the purchase of mills and canals, and compensations of all kinds, to guide us in framing a new general act, comprehensively embracing all specific cases likely to arise. A measure of this kind, laying down principles upon which claims are to be regulated, would be a novelty; but one approaching to the general character I have been insisting upon is already before the public. For in the spring of 1852, a Bill for the "Drainage and Embankment of Lands" was presented to the House of Lords by the Earl of Carlisle, who, on withdrawal from office, brought in and left it as a bequest to the Ministry succeeding that of which his lordship was a member. The provisions (comprising 133 clauses) are so important, and so nearly answering to the requirements of the country, that I must give you a brief outline of them; although no legislation on the subject has taken place from that time to this. Instead of dividing England and Wales into districts, it is left for any persons interested to apply by memorial to the Enclosure Commissioners, accompanied with maps, plans, and estimates of proposed works; the Commissioners are then to convene a meeting of all parties concerned; and if the assents received represent three-fourths in extent of the land, they may declare the lands, etc., to be a "drainage district." Proprietors vote without regard to the amount of their interest; and tenants are considered jointly with owners, where the lease is of longer term than 14 years, and the rental under two-thirds of the clear annual value. At a meeting called for the purpose, a body of trustees, not less than six nor more than nine in number, is to be chosen by "the persons interested in the greater portion in extent of the lands, etc., represented at the meeting;" and the election is for seven years. The same meeting is also to elect a Committee of Works, to which trustees are eligible. In case of neglect or refusal to elect these bodies, the Commissioners appoint them themselves. The Board of Trustees, with proper officers, is to make all contracts for works; raise funds; render annual accounts, open to public inspection; submit to the Commissioners, once a year, a detailed plan, specification, and estimates, etc., of the works proposed to be undertaken in the district during the ensuing year; and, in fact, be the responsible managers. The Committee of Works is to supervise the execution of the works; the Board of Trustees to superintend the Committee. The Enclosure Commissioners are to determine disputes between the two bodies. No works are to be undertaken without the approval and order of the Commissioners; and they are to report their proceedings annually to one of the Secretaries of State. The moneys required are to be raised by rate, assessed upon the whole of the lands in the district, in proportion to benefit received; or by mortgage upon the security of the lands to be drained, by way of terminable annuity: and any owner may appeal to the Commissioners, if dissatisfied with the assessment of the trustees. This, then, is the organization: Initiative and executive local representative bodies, governing the water-interests of separate districts, and charging the expenses of improvement and maintenance upon all the lands, the owners of three-fourths the extent of land binding the minority to contribute; and all under the controlling head of the Inclosure Commission. What "works" may be executed? The trustees may alter any weirs, dams, streams, &c., or construct new works for discharging floods, or lower the water-level of a river, provided they do not lessen the water-power or supply to mills, towns, or factories. Then they may purchase and remove any "mill, factory, weir, dam, or other work of obstruction;" or, not agreeing for the purchase, they may take the same, and award compensation—that is, with the express authorisation of the Commissioners. Nothing is said, however, about substituting steam or wind-power instead of the

water. If a mill derive increased water-power, it may be rated accordingly. They may "make, erect, or put down main cuts or drains, embankments, roads, walls, dams, engines, catchwater and other drains, aqueducts, tunnels, sluices, culverts, training jetties, gates, fences, and also stop up or divert any road or remove any bridge, and make any new road or bridge, and also from time to time repair, alter, or remove any sluice, floodgate, hatch, tunnel, road, or other works now made or to be made, and divert, deepen, widen, cleanse, and scour any ditch, drain, water-course, or side-cut now existing or to be made, and also do all such things, and erect and maintain such steam and other engines and machinery, and execute all such works as may be necessary or convenient for the purposes of this Act." And they may construct works through lands not proposed to be drained, by making compensation. They may make reservoirs and embankments, diverting surplus waters into them, for the better application and extension of water-power. For supplying water to mills and works on any stream, with the consent of the proprietors of three-fourths of the value of the water-power, the Commissioners may authorize and direct the proprietors to elect trustees for making and maintaining reservoirs and embankments, to be charged upon all the mills, etc., along the river that may be benefited. Works may be made within the jurisdiction of other boards of trustees or the Commissioners of Sewers, subject to an appeal to the Board of Trade. The trustees may purchase land for their works, but not more than three acres of any person, unless by agreement, without an Act of Parliament; and the claims of proprietors, when land is required, is to be referred to arbitration, or to a jury, under the "Lands Clauses Consolidation Act." The Commissioners are to make a final award upon the completion of the works; and the trustees are to keep and maintain the works in repair, and also at the expense of the district sustain any outfall or embankment which may be necessary, but lying without the district. Ornamental waters, or the water-supply of towns, or the limits of parks, are not to be trenced upon without consent of the owners. There is a clause saving Local Drainage Acts, Commissioners of Sewers, &c.; and then, one provision which leaves a difficulty—no work is to be made if "injurious to the navigation of any navigable river or canal." The act empowers any individual owner or any number of owners to obtain a right of executing works through the lands of other proprietors, without the intervention of any board of trustees, by appealing to the Inclosure Commissioners. This meets a want which is felt in innumerable cases of deep subsoil-drainage on estates which have to drain through the shallow and circuitous water-courses of less intelligent cultivators. The Act of 1847, carried by Lord Lincoln, (the latest legislation on the subject,) gives us a similar remedy in such cases, where it would be worth our while to make the works, and pay compensation out of our unassisted pockets. But there is no law at present by which an opposing minority can be made contributory to the expenses, however much they may be benefited by the works; and our Land Drainage Companies, while possessing very great powers and facilities, are unable to levy rates upon dissentient proprietors. Lest the proposed general act should be viewed with jealousy, as placing too much power and arbitrary authority in the hands of the Inclosure Commissioners or other department, anything like *Bureaucracy*, as exercised in France, being as repugnant to the feelings of Englishmen as to the spirit of their laws, I wish to explain briefly the working of the Inclosure-office, and to show that it possesses facilitating rather than centralizing powers. And for the following particulars, which further illustrate the great advantage of a general statute, I am indebted to John Wm. Tottie, Esq., of that office. 1. Inclosures may proceed on the assent of persons representing two-thirds of the entire interest in the land to be effected. 2. The valuer, who is the officer empowered to carry out the inclosure, is appointed by the majority of persons interested, attending a meeting specially called for the purpose, the Commissioners having no power to appoint, except in cases where the majority in number and value cannot agree. The same provision as No. 1 is contained in the Drainage and Embankment of Lands Bill, whereby three-fourths of the interests may bind the entirely—a most valuable provision, as one individual will sometimes prevent the improvement of an entire district. The Commissioners' Report, before alluded to, shows the ex-

tent of their operations, comprising 767 applications for inclosure, 681 of which have been completed, or are in progress, for the improvement of 488,423 acres of land. A large number of applications are for exchanges, under powers that cannot be too generally brought under the notice of landed proprietors, for their value in laying land together for convenience of occupation, and also for laying together lands held under the same title and subject to the same charge, because the lands taken in exchange under these powers enure to the same uses and are subject to the same charges as the lands given in exchange: the official charges for these exchanges seldom exceed £3 to £5. In addition to the before-mentioned duties, considerable powers have been exercised under the various drainage acts, as shown in the subjoined table; and these powers have likewise been exercised in all cases, as far as possible, through local agency; the parties applying for loans being required to submit their plans of drainage through local inspectors acquainted with the respective districts, rather than through the medium of officers sent down into the country from town.

Title of Act.	Amount applied for.	Number of Applicants.
Public Money Drainage Act	4,000,000	3,179
Land Improvement Company's Act	1,262,890	348
General Land Drainage Company's Act	399,119	106
Private Money Drainage Act	122,045	133
Scottish Drainage Act	37,350	16
West of England Drainage Company's Act	166,462	20
	£5,987,866	3,802

I have hardly touched upon the minor drains and ditches conveying the water of one farm through another, or dividing different properties, and subject only to such maintenance as the drainage-ideas or good-nature of occupiers may choose to bestow—improvement not possible to be enforced, and only positive injury to the farms further back, rendering occupiers liable to a suit for damages, or to being taken before two Justices of the Peace, as ordained in the Act just mentioned. A far larger extent of land is damaged, or denied the first improvement of deep-drainage, by these myriad drains and water-courses, than by all the brooks and larger rivers; and they are already made such matters of endless squabble between occupiers, that some stronger interposition of the legislature is required than the mere appeal to the magistracy which this law provides. Instead of passing one statute to let us "scour and cleanse" outlets through intervening properties (like the Act referred to), and, finding that useless, pass another "for widening and deepening," and then another (that would be needful), giving power to "straighten," and so on—a fresh Act for every new difficulty a drainer may meet with as the work extends—would it not be a better plan to relieve neighbours of such irritating duties as binding one another down to the strict letter of piecemeal legislation, by the bolder course of establishing an authoritative supervision over all the drains together? It would be a great simplification of matters if all these smaller drains, as well as the larger arteries now spoiling good land, were included, as I have before said, in the drainage districts, and placed under the supervision and control of the local board and its officers. Complaints could be easily made; and the responsibility of taking action would rest on broader shoulders than those of a poor tenant. Lord Carlisle's Bill expressly provided that the trustees of a district might enforce the cleansing and scouring of drains and sewers of all kinds by the parties liable. Where there are no trustees, it authorizes similar proceedings to those of the present law, namely, doing the work for a defaulter (of course with a warrant, if upon his land, and not a mere boundary drain), and recovering the outlay; but it goes a step further, and grants the "deepening" of such water-courses, subject to an appeal to the Quarter Sessions. Of course, with a general Act, dividing the kingdom into districts, a direct supervision and management might be established. I do not admire a centralized government: preferring, as far as is expedient, to administer my own affairs. Yet I do think that some such measure as I

have lightly sketched out would be applicable to our present situation, without trenching too closely upon the liberties of the subject. There appears, however, to be a feeling, with some parties, in favour of a universal arterial drainage carried out by the Government, according to the designs and under the inspection of commissioners: with a staff of hydraulic engineers like those of our neighbours the marshy Hollanders, or of our own India, or of Northern Italy, where a warm climate renders water almost an institution of the country, and irrigating liquid is measured out to the husbandman almost by the quart. But, of course, under any system short of absolute despotism, it must be left for every locality at any rate to say whether it will remain drowned or no. We certainly do permit the Government to aid us in many ways besides "protecting person and property": it carries our letters, enlightens the inventive minds of would-be patentees, surveys and maps our country, has jurisdiction over tidal streams and marshes, lights our shores, and makes charts of rocks and soundings for shipping, secures us a penny-a-mile ride by the railway, and violates theoretic political economy by fixing (not the standard value of precious metals, but) the fare we are to pay poor cabby! Whether the same power that figures so well as a military storekeeper (on "the Weedon system") would shine better in drainage works I cannot tell; but it is clear that Government *can* collect statistics and institute surveys; and I shall therefore close my lengthy address by making the following proposal: As a preliminary step to the framing of a general act of parliament, let a Royal Commission be appointed to examine the real drainage condition of the whole country, reporting upon the needful works and other requirements of our river valleys, somewhat as another commission has already done for our tidal harbours. What extent of ground in this kingdom is subject to inundation? What still larger area is imperfectly furnished with outfalls for drained arable and pasture? What actual damages are periodically suffered? What does the country lose by the extent of good husbandry prevented? In what degree do the town and rural populations owe the prevalence of disease to the stagnant or deluging rivers? What are the special evils and obstructions to be removed in each district? How could these be equitably abolished? In which cases would the increased value of the lands or other benefit pay for amelioration? Where are the cases in which improvement would be too costly? We ought to possess full and clear answers to these and similar inquiries; but at present, all we know is fragmentary, collected by individuals who, with all their painstaking, cannot measure the mischief or form a just idea of the alterations required. To arrive at approximative statistics on all these points (in many cases not needing a minute survey) a commission need not expend a very heavy sum of money. And then, still further, besides inquiring into the most satisfactory methods of dealing with conflicting claims and interests, with a view to the framing of a general act, investigations of an engineering character might be instituted—as, for instance, into the maximum daily downfall and the possible discharge of districts varying in climate and geological structure; the augmentation of drainage delivery, by improved farm management; the effects of the tidal flow in different river channels; the rate of deposition of alluvial sediment upon salt marshes, and so on—most important points for the guidance of the drainage engineer, and without a knowledge of which in greater fullness than at present exists, works will be made of unsuitable dimensions, and money may be squandered in vain. As an illustration, I may mention that the usual tables of average rainfall were utterly insufficient to guide the Irish drainers in designing conduits of the right capacity for conveying away the sudden floods; and it was only after a long and patient registry of observations in all parts of Ireland, they discovered that from half a cubic foot up to thirteen cubic feet per minute for each acre of catchment basin had to be discharged from different districts, depending upon locality, state of cultivation, aspect of the lands, and other circumstances. Neither were they at first prepared for the great additional volume of water which descended as the upper works proceeded, and as under drainage began to deliver into main ditches water that had previously passed into the air by evaporation. The collection of such engineering data, being of a more prolonged character than the simple examination of districts and investigation of the social and legal questions connected with the improvement of river drainage, could be better carried out perhaps by some other organization under one of the Government

departments; but the appointment of a drainage commission, consisting of individuals conversant both with engineering and agriculture, and capable of taking broad views of the multitudinous claims and interests that would come before them, is a step that the Government could easily take, and one that would undoubtedly win the approbation of all classes of the community. There are plenty of precedents, too, for such a proceeding on the part of the Crown, as keeper of the soil of the kingdom, to be found in the records of fen drainage, extending indeed back to the early institution of our Commissions of Sewers.

Mr. BAILEY DENTON (Stevenage) would be glad to say a few words upon this occasion, because the magnitude of the subject was such as all must acknowledge. Everybody admitted, that sooner or later something must be done. It was only a question of time; and many efforts, besides those of the Earl of Carlisle, had been made to promote legislation on the subject. Lord Carlisle, however, happened to introduce his bill just at that juncture, which rendered it opportune; though from circumstances the attempt had not been repeated since. In that year (1852) when Lord Carlisle introduced his bill, more rain had fallen, than had fallen in the aggregate in the four years which had succeeded. Now, during those four years drainage had much progressed; and he believed he had made it clear, by certain experiments of his, that every acre of clay land drainage added very largely to the influx of water into the valleys (Hear, hear, from Mr. Mechi). Mr. Clarke himself had referred to the Hinxworth tables, which showed that a thousand gallons per acre per diem were discharged into the valleys from drainage. He (Mr. Denton) might add that those tables showed, contrary to the expectations of many men who did not believe in the porosity of clay, the clay lands that had been properly drained had, within 24 hours of any heavy rain-fall, and after the lands had become saturated, discharged at least one moiety of the quantity which had fallen on the surface (Hear, hear). Now, he need not dwell on the importance of improving the arterial drainage of the country. He had remarked that, at the time when Lord Carlisle introduced his measure, there seemed to be an almost unanimous desire for arterial drainage. In the four months of November, December, January, and February, 1852-53, there was a rainfall of 16 inches; the average fall in this country, in those months, during the last forty years, having been 11 inches. Since 1852-53 there had not fallen in any corresponding period more than $4\frac{1}{2}$ inches average. With these facts before them, they had no difficulty in understanding how it was that the interest in the subject of arterial drainage had of late years decreased; in fact, so little interest had it excited since the winter of 1852-53, that he had met with persons who thought that there was no necessity for any drainage at all; and he had almost felt that in his own case "Othello's occupation" was "gone" (laughter). But nature always balanced herself; and, sooner or later, they would have a downfall, which would make many people regret that they had not taken advantage of Lord Carlisle's measure, and had slept during the dry winters which succeeded its introduction (Hear, hear). He quite concurred in what Mr. Clarke said about the desirability of having a central commission, and of the division of the country into districts; such a commission was required for many reasons. In the first place, as regarded the main arteries, they were obliged to go to Parliament for powers to interfere with them, and having obtained those powers, they frequently pledged themselves to works which it was afterwards found inconvenient to carry out (Hear, hear). In the Nene case it was necessary to go to Parliament a third time to perfect the scheme; and after all, it would be found that the undertaking was one that would not warrant the outlay—the area was too small to warrant the expense that had been incurred and must be incurred. If there were a central commission, it would operate in such a manner that they would avoid the immature character of all parliamentary plans, and have an opportunity of retracing their steps—they might stop at any moment on making a proper application; whereas, under the present state of things, when they had pledged themselves to Parliament, they must go on, though incurring inevitable loss. So disastrous had been the result on the Nene, that bonfires were now made in the neighbourhood of Wisbeach of the materials used in the unfinished works. There not being money enough to carry out the original scheme, what had been done already was a failure, and hence all who were concerned in it were disgusted. These results would

be avoided under a central drainage commission. Then, in what position were they with regard to the minor streams, those streams which, as regarded under-drainage, were more important even than the main streams? It was a positive fact, as Mr. Clarke had stated, that they could not in any way deepen or straiten a stream. He had been in that room when much discussion had taken place on the subject of deep drainage; and he could tell them, from experience, that there was greater force in the impediments which Nature had imposed than in all the arguments which he had heard against deep-drainage in that Club. What was their position in this respect? The improvement made in the law by Lord Lincoln's Act extended merely to the clearing out of existing shallow and tortuous streams. To avail themselves even of that slight improvement, they were obliged to go before justices. A man must appear against his near neighbour before two other neighbours, the justices; and the result was that there were not half-a-dozen cases, he believed, in which proceedings had been taken under Lord Lincoln's Act. It was a common belief that the present companies had no power to deepen and improve outfalls. Acting as he did for one company, and knowing what was contained in their Act, he would assert that, practically, they had no power at all. Their powers were such as necessitated an appeal to a jury or to arbitration, as in railway compensations; and this involved an expense and difficulties which amounted to a positive prohibition of proceedings. So far from the companies having the powers which they were supposed to possess, he would repeat that, owing to the impediments placed in their way, their nominal powers were of no utility. He might advert to the fact that there existed throughout Lombardy, where water was used with great care and paid for with great willingness, a power of carrying water through an intervening property, from the source whence it was obtained to an estate where it was considered desirable to use it. It appeared to him a disgrace to the intelligence of this country that there should not be power here to conduct water from a property where it was injurious to another where it was wanted, and to deepen and straighten existing outfalls. He had been accused of never coming to that room except when he wanted to speak on his special subjects; but, for his own part, he thought it was a great compliment to the Society, to imply that the members only spoke on subjects on which they were informed (Hear, hear). What he had said was said with earnestness; and he trusted that it would assist in throwing light on the subject.

Mr. R. HOLMES (Arundel, Sussex) said the subject under discussion was one in which he had taken great interest for many years. He had the honour to be clerk to a commission of sewers which had jurisdiction over nearly 8,000 acres of land; and his experience convinced him that there ought to be a general commission, having powers similar to those which were entrusted to the Commission of Sewers. The district to which he alluded embraced a very large area in Sussex, including a tidal harbour; and the improvements effected of late years were such, that almost the whole of the sluices had been lowered something like four to five feet. Great benefit had been derived from what had been done, and sewers rates to carry out the improvements had been in most cases cheerfully paid, even to the amount of 20s., 30s., and 60s. an acre. The jurisdiction of the commissioners extended generally to lands which were liable to flood-water. They wanted power to drain land which was dammed back by mill-streams, canals, and other like impediments. A paltry little mill, which was rented, perhaps, at only £50 a year, caused the water to flow back on two or three hundred acres of land; and in such cases, the obtaining a fall of three or four feet would be an immense benefit. He entirely concurred with Mr. Clarke as to the necessity for extending arterial drainage.

Mr. Alderman MERRILL (Tyntree) rose principally to thank Mr. Clarke for the very truthful and able paper which he had read. His own opinions on this subject were expressed very fully many years ago. He believed they could hardly over-estimate the damage which was done by the heading back of water. He had heard millers say that so instantaneous was the check caused by shutting off a mill, that if two mills were a mile or a mile and a half from each other, they could tell immediately what was happening at the upper mill or the lower mill, as the case might be. He quite concurred in the opinion that the loss

which was occasioned by these impediments was not at all counterbalanced by the advantage which the millers received; and to buy them off, by some such means as had been suggested, would in his opinion be a great benefit to the country. In former times the law threw its mantle of protection over the millers, and very naturally, because the country had only wind and water to prepare its daily bread; but the introduction of steam had so cheapened the cost of grinding, that he had heard a miller declare that he could grind 100 qrs. of corn with 14s. 6d. worth of coal. He admitted, however, that vested interests must not be sacrificed (Hear, hear). That the courts of law had allowed considerable latitude to millers no one could deny. He had met with cases in which when the wood-work was worn out, it was replaced with wood raised an inch higher, and afterwards with another inch under the same pretext, and thus very valuable lands had been injured, and the law did not afford any remedy. He knew one instance in which a miller would not allow the occupier of a meadow to put a pipe under a small stream, though the effect would have been to render that meadow four times as valuable as it was. Let the water should be interfered with, the miller would not allow a pipe to be placed in the bed of the river. They were all now aware that water would penetrate through heavy clays. A few years ago it was generally believed by the farmers of this country that in the case of purely aluminous clays it was no use making drains, as water would not go through them. He was happy to find, however, that that opinion was gradually dying out. It had taken fifteen years to convert some persons, notwithstanding all the evidence which he placed before them (laughter); but they at length appeared to be convinced. The fact that only one-sixteenth of the land which had required draining had been actually drained showed that there was still a large amount of prejudice to be removed; but he was very glad to find that the minds of agriculturists were getting more and more enlightened on the subject.

Mr. R. BAKER (Witle) said his own farm was bounded by a river for the greater part of a mile; and when he first took the farm, in harmony with the principle of Solomon's declaration that all rivers ran into the sea, his ditches ran into the river. But from time to time the encroachments of the river had been such, that the water was for the whole extent one or two feet, and in many places several feet, above the level of the farm; and the result was, that he had been obliged to cut another channel parallel to the river, and intercepting the water. Of course it was open to him to resort to a court of law; but this would perhaps have been ruinous, and he therefore submitted to the inconvenience to which he was subjected. Looking at the question in a general point of view, he must say it was one that deeply concerned the nation at large. They all knew how expensive it was to obtain an Act of Parliament to carry out any particular scheme; but if there were a general Act, that obstacle to improvement would be removed. All inclosures were formerly effected under the authority of separate statutes; but there was now a general Act applicable to all cases, and the expense attending inclosures was very greatly diminished. In principle he could see no difference between inclosures and drainage; the grand object to be secured, in a national point of view, being the production of the greatest amount of corn that could be obtained from the land. He hoped that before the new reform bills changed the character of our legislation, and while farmers still exercised some influence over a large proportion of the Members of Parliament, efforts would be made to secure a remedy for the evil in question, and that a short general bill would if possible be obtained during the present session. That this was a very important question in a densely populated country like ours, no one could doubt who calmly reflected on the matter. As was observed by Mr. Mechi, what was once a necessity of the country for the grinding of corn had ceased to be so. Steam was now found to be a cheaper motive power than water. The same remark applied to windmills. Windmills were not injurious, like water, to the surrounding neighbourhood; but not being so cheap as steam they were all disappearing, and probably no more windmills would be erected. He hoped to live long enough to be able to say that no more water-mills would be built; but the vested interests connected with water-mills, canals, and waterworks were so considerable, that a large amount would be required to purchase them. Common sense of course required that the minor interest should be sacrificed to the major, and that the production of food for the country should have precedence over every other object.

Mr. WILLIAMS (Baydon, Hungerford) observed that the gentleman who introduced the subject appeared to differ from the wise king of Israel in his declaration that all rivers emptied themselves into the sea. Was it not possible that the reclamation of lands in the Lincolnshire district had been carried so far as to do away with the outlets for the rivers there?

Mr. S. SIDNEY (Peckham) said this was not merely a tenant-farmer's or landlord's, but a national question—a question affecting in the closest manner the cultivation of the soil and the production of food (Hear, hear). It could not be solved satisfactorily without a great amount of labour and a large expenditure of money, and the money required could not be supplied by the parties interested, but must in great part be contributed, by the whole nation. Mr. Clarke, who had so ably introduced the subject, had done good service some years ago, by means of an admirable paper in the *Journal of the Royal Agricultural Society*. They all knew, however, that in this country, although it might be right that a particular thing should be done, it could not until the public were convinced that it was right; and unless such men as Mr. Clarke, Mr. Bailey Denton, and other gentlemen present whose modesty had prevented them from speaking, reduced their information to paper, and circulated it among the persons to be influenced, the purse-strings of the nation would not be unloosed for the accomplishment of the object. It had occurred to him that in this matter very excellent service might be rendered by the Royal Agricultural Society. That Society had no doubt done a great deal for agriculture; but he was one of those who ventured to say that it might do a great deal more, and that, having acquired the confidence of the public, it should actively exert its influence to retain that confidence. He thought, for example, that that Society might advantageously appoint a committee to draw up a number of questions, to circulate them among persons who lived on the borders of rivers, and who were therefore subject to the evils of alternate flooding and dry seasons; and with the assistance of the answers, draw up a report for the guidance of Parliament. That would prepare the public mind to yield the funds required for the removal of the evils which had been so well pointed out by Mr. Clarke. He thought it was premature at present to go to Parliament to ask for a Commission. The public had been disgusted with the action of commissions (Hear, hear), because many commissioners had proved utterly unfit for the duties they undertook to perform; and if a commission were now appointed for the carrying out of improvements in arterial drainage, the lowering of mill-dams, and the compensation of millers, it might reasonably be apprehended that these important duties would be entrusted to raw ignorant and inefficient hands (Hear, hear). As to Mr. Baker's allusion to the contemplated reform of Parliament, he did not believe any parliament would ever entertain feelings of hostility to the agricultural interest.

Mr. J. HOWARD (Bedford) said, although he frequently attended the meetings of the Club, he seldom took part in the discussions, the subjects being generally of a purely agricultural character; but he thought that on a question of this kind those who were engaged in practical agriculture might fairly look for assistance from those who were in a different position. The whole country, in fact, was deeply interested in arterial drainage. The health of the entire district comprised in the valley of the Ouse had been very seriously affected by the damming-up of that river. Far be it from him to advocate injustice to the owners and occupiers of mills on that river; and he thought that if the suggestions of Mr. Clarke were carried out, such persons ought to be dealt with in a liberal spirit (Hear, hear). Mr. Clarke had alluded to the injury done by main drains, and parish drains or ditches, and he could corroborate what fell from him on that subject. Up to about eight years ago, the village of Cople, near to where he resided, was scarcely ever free from typhus fever. At that period the Duke of Bedford cut a new ditch to drain a portion of the parish, and since then there had been only one case of fever. He thought, therefore, that great improvement might be made in the watercourses of various parishes. He had himself witnessed the damage done to some of the low-lying parts of his district by the overflowing of the main ditches; and he particularly remembered that, two or three years ago, the young wheats were flooded two or three times before Christmas. There might be great difficulty in carrying out the improvements which Mr. Clarke advocated;

but of this he felt quite certain, that if the work were left to the localities themselves it would never be effected (Hear, hear).

Mr. OWEN WALLIS (Overstone Grange, Northampton) said no one present could be more sensible than he was of the utility of arterial drainage when properly conducted. There could be no doubt that a great deal of land suffered very materially for want of sufficient outfall, particularly land which lay immediately above the water-level of the large streams. But if drainage was to be effected at the cost that had been incurred in the valley of the Nene, of which he was unfortunately a native and a resident, it had better be let alone. There hundreds of thousands had been expended, hundreds of thousands more would have to be expended, and he believed there was not a proprietor in the valley who was sanguine enough to expect ever to receive one shilling for his pound. He did not mean to say that the work had been improperly begun; he knew many of the gentlemen with whom the scheme originated, and they were undoubtedly men of the highest character, actuated by a desire to do good to the valley; but a great mistake had certainly been made, and he hoped it would be a lesson in all future draining operations. Mistakes of that kind did more to retard the work of drainage generally than any prejudice which had to be overcome. It was doubtful whether many cases the draining of flooded land was so beneficial as some persons supposed. He had occupied land which had been only partially flooded, undoubtedly to its injury; but adjoining land that was deeply flooded had received great benefit; and he knew other occupiers of land on the Nene, who feared that if drainage were carried out to the extent proposed, the best description of meadow-land would be materially injured by the process. The great source of injury along the borders of the various streams was unquestionably the mills. They held up the water; and whenever there was an opportunity of raising the weirs, it was seized, and thus the evil was increased. There was, indeed, a law to protect those who were injured in that way; but the process was so disagreeable, that hardly any one had recourse to it. In his own district there was a fall of something like 160 feet between Wisbeach and Northampton, and yet they were paying an enormous sum for an outfall.

Mr. C. E. AMOS, (Consulting Engineer of the Royal Agricultural Society,) said: Being a native of Lincolnshire, he had had frequent opportunities of noticing the outfalls of the rivers in that part of the country. It was quite clear that a great evil existed, but it was not so clear what was the remedy. It would not be sufficient to overturn the mills, because the present outfalls would not take away the water, and the expense of getting proper outfalls would be too heavy to be borne by the district which received the immediate benefit. The first requisites were to increase the area, and to deepen and straighten the outfalls. But it was impossible for the agricultural interest to bear a heavier impost than it was doing already; and if drainage was to be carried out effectually, it must be dealt with in a comprehensive manner.

Mr. CLARKE, in replying, observed that he gathered from what had fallen from the different speakers that it was the general opinion that the question was not yet sufficiently ripe for any active step towards securing legislation, but he should be happy to do anything in his power for the diffusion of information. In illustration of the advantages derivable from a general drainage Act, he stated that from a return issued recently by the Inclosure Commissioners he found that the total cost of proceedings in twenty-two cases of enclosure, embracing 6,000 acres of land, was £365, showing an average of little more than £16. He hoped that at no distant day they would be able to congratulate each other on the attainment of a practical issue to that discussion.

On the motion of Mr. Gray, seconded by Mr. Skelton, a vote of thanks was awarded to Mr. Clarke for his paper; and on the motion of Mr. Howard, seconded by Mr. Wiltsher, it was resolved,

“That the committee be requested to take into consideration the question discussed that evening, at their next monthly meeting.”

The proceedings terminated with a vote of thanks to the Chairman.

LIABILITIES OF FARMERS FOR RENT IN CASE OF FIRE.

COURT OF QUEEN'S BENCH, JAN. 21.

LOFFT and others v. DENNIS.

This important case came on for argument before the full Court upon demurrer. Mr. Godfrey appeared for Mr. Capel Lofft, of Bridgewater, Somersetshire, barrister-at-law; the Rev. Thos. Settlewood Gleadowe, of Fodesley, Shropshire, clerk; and the Rev. Frederick Elwes, of Wixoe Rectory, Halstead, Essex, clerk, plaintiffs; and Mr. Phipson and Mr. Joseph Kay appeared for the defendant, who is a farmer, residing at Wicken, in Cambridgeshire. Mr. Jackson, Haverhill, attorney for plaintiffs; Mr. Cross, Ely, for defendant.

By the statement of the defendant's case it appeared that defendant was tenant, under the plaintiffs, of a farm called "Spiney Abbey," in the parish of Wicken, Cambridgeshire. At the time when he entered into possession, there were the usual farm buildings and conveniences; no agreement was made respecting insuring the buildings, but the lessors effected an insurance, paid the annual premiums, and sometimes employed their tenant to pay the policy for them. The defendant, knowing that the buildings were so insured, and not being bound to insure, and believing that, if the buildings were injured or destroyed by fire, the lessors would be bound to restore them, did not effect any other insurance upon the premises. After the defendant had been in possession for many years, the premises were destroyed by a fire, which took place in June, 1856, and thereupon the plaintiffs applied to the Royal Exchange Insurance Office, and received the full value of the damages (about £1,000) which had been caused by the fire. They refused, however, to rebuild the premises, or any part of them; and subsequently, when the rent became due, they brought an action against the defendant for his rent, making no reduction on account of the destruction of the farm buildings. The defendant objected to pay, on the ground that his landlords had received the value of the buildings, and refused to restore them. These facts he stated in the form of an equitable plea to the plaintiffs' declaration. The plaintiffs objected by demur to these facts, as being no answer to their claim.

It was contended for the defendant that the claim was a most unrighteous one, and that there were many authorities in the books to show that it could not be established. The defendant relied on various cases decided, and particularly on the case of *Brown v. Quilter*, 2 Amble's Reports 619, in which the then Lord Chancellor said: "The justice of the case is clear, that a man should not pay rent for what he cannot enjoy, and that occasioned by an accident which he did not undertake to stand to. I am much surprised it should be looked upon as so clear a thing that there should be no defence to such an action at law, and that such a case should not be considered as much an eviction as if it had been an eviction of title, for the destruction of the house is the destruction of the thing. When an action is brought for rent after the house is burnt down, there is good ground of equity for an injunction till the house is rebuilt." Defendant's counsel further relied on Lord St. Leonard's *Handy Book*, in the 15th letter of which it is thus laid down: "If you (the landlord) have insured, although not bound to do so, and received the money, you cannot compel payment of the rent, if you decline to lay out the money in rebuilding."

The counsel for the plaintiffs stated that there were peculiar circumstances which led to the non-reinstatement of the premises, and for which the defendant had himself alone to blame. Immediately after the money was received from the Insurance office, the Rev. F. Elwes, one of the plaintiffs, went to the farm with his builder, to make arrangements for the reinstating of the buildings; but he withdrew when he found that the defendant, who was only a yearly tenant, set up a claim to have a lease. By that claim he prevented his landlords from accepting an offer to purchase the farm, which was afterwards sold at a loss of £750. The defendant paid the rent for three successive half years after the fire, without any claim to a set-off on the ground of the buildings not having been restored. The farm was sold last summer, and it was not till after the sale, when the defendant was called upon for the half-year's rent to Lady-day (£235), that he laid claim to such set-off, although, as a yearly tenant, he might have previously

quitted possession. But for his own obstinacy the premises would have been reinstated soon after they were destroyed. On the question of the legal right to recover the rent, plaintiff's counsel replied upon the case of *Leeds v. Cheetham*, 1 Simons' Reports 146, decided by Vice-Chancellor Sir John Leach, which was opposed to the authorities cited in favour of the defendant.

Lord Campbell said that by the law of Scotland, if premises were burnt down, the tenant was relieved from the payment of rent; but by the law of England, if there was an absolute covenant to pay rent, the covenant must be performed, though the tenant derived no benefit from the premises. So also in Scotland, where shootings were rented, and it turned out there were no grouse, the payment of rent might be resisted. But, by the law of England, it was no answer to an action for the rent to say that the premises had been burnt down; nor was it any ground for the interference of a Court of Equity. It was said the plaintiffs had insured, though they had not entered into any covenant to do so, and had received the money. It might be that they would act unhandsonably, if, under such circumstances, they did not lay out the money in rebuilding, and harshly, if they brought an action against the tenant for the rent; but that was not the equity which formed the ground for the interference of a Court of Equity. The case of *Leeds v. Cheetham* (1 Simons, 146) was an authority on that point by a court of co-ordinate jurisdiction, and by it this Court ought to be bound. If the defendant wished to overturn it, he must go to a Court of Error; but he (Lord Campbell) must say he entirely approved it. It made no difference that the landlords had received the money, for they were not bound to lay it out. His lordship added some strong expressions in favour of Lord St. Leonard's *Handy Book*, and said that if it were proposed to make it law, he should support such a proposal; but at present it was only the opinion of a learned judge, and the Court could not be governed by it, contrary to a most solemn decision.

The other judges (Justices Wightman, Crompton, and Hill) were of the same opinion, that the plea was no answer to the action.—Judgment for the plaintiffs.

STRENGTH OF FOOD.

When wheat is low, and meat is high, turn wheat into meat;
And when wheat is high, sow more land with wheat,
Which will lower the price of the bread we eat.

SIR.—We now greatly require the agricultural chemist to know the strength of wheat in feeding cattle, sheep, and swine; and if meat can be produced at less per lb. by wheat than by cake, beans, or barley, &c., &c., &c., it is highly expedient and wise to use it. If a farmer means profit, he ought to feed upon the cheapest food, and send it to the dearest market when fed. Farmers ought to know the strength of the food they feed with, as well as the strength of the manure they lay on their lands. Not knowing the strength of each, they know not whether it is cheap or dear. For the want of knowing chemistry in both, the farmer works without a line or rule, which is monstrous in the great age of discovery, and over the middle of the nineteenth century. Whilst agricultural chemistry is in its infancy, agriculture will keep in the cradle, and require leading strings as in the strength of food and artificial manures, according to the *Mark Lane Express* and the *Farmers' Magazine* and common sense. If every kingdom or country was to increase the growth of wheat per acre in proportion to England, the human race upon the earth would not consume the wheat grown yearly; it must, if used, be converted into meat. Our gigantic improvements in agricultural implements will find their way to all parts of the earth to cultivate their land with; and our great improvements in agriculture, nay, in cattle, sheep, and swine, will find their way into far distant climes, all of which will produce an immense quantity of food for man, so that the British farmers may prepare themselves for an increase of produce of the land to compensate them for the diminution of price. An abundance of corn in the market will make bread cheap, and a low price of corn will soon cheapen meat.

SAMUEL ARNSBY.

Millyfield, Peterborough, 1859.

ARE THE FEATHERED TRIBES BENEFICIAL TO THE FARMER, OR OTHERWISE?

At the Knighton Farmers' Club, Dr. Davis, of Knighton read the following important paper:—

“Not being, I am sorry to say, a practical farmer myself, I have no observations of my own worth submitting to your notice. Two or three agricultural neighbours whom I have consulted, and one devoted ornithologist, told me that the birds most injurious to the crops in this country are the rook and sparrow. To the consideration of these, therefore, I have confined myself. But the observations I have gathered may, as you will see, apply to other tribes of birds; and as regards them, I have consulted the best authorities I could find. And first, Mr. Yarrell, the writer on British birds, in his chapter on rooks, says: ‘The balance between injury or benefit derived from rooks by the agriculturist is a question which general opinion seems to have settled, by considering that the original injury is much more than counterbalanced by the amount of benefit conferred by the consumption of thousands of destructive grubs of the common cockchafer, and of the wireworms of several sorts. These, and probably many others equally injurious to vegetation, are searched for and devoured with avidity, forming a very large proportion of the food of this very numerous species of British birds. Early in the morning rooks visit meadow-land, while the grass is yet wet with dew, and break their fast on worms and slugs, which the moisture of that period induces to crawl forth. Later in the day, they may be seen either searching newly-ploughed ground for the various insects there exposed, or again visiting pastures for similar purposes. There they are accused of injuring the grass by pulling it up by the roots: but it has been stated, and I believe truly, that this is an error arising out of the following circumstance: In searching for grubs which are concealed in the earth, and supported by eating the roots of the grass, the rook pulls at the blade of grass with its bill; and when the grass comes up readily, the bird knows that there are under it insects which have destroyed its roots, and in this way detects them: but if the blade of grass is firm, the rook goes to another part of the ground. In a field where grubs are abundant, the rooks scatter the grass everywhere, so as to give the appearance of having rooted it up, while they have only exposed the depredations of the insects by which the roots were destroyed.’ The author of the ‘Journal of a Naturalist,’ Mr. Knapp, speaking of the readiness with which rooks detect the places where grubs are sure to be found, says: ‘I have often seen them alight on a pasture of uniform verdure, and exhibiting no sensible appearance of withering or decay, and immediately to commence stocking at the ground. And the rooks seem to have learned by experience how to select those plants which are most likely to afford them some recompence for the trouble they take in grubbing them up.’ Mr. Jesse, in his instructive ‘Gleanings,’ says: ‘A gentleman once showed me a field which had the appearance of having been scorched, as if by the burning sun in dry weather. The turf peeled from the ground as if it had been cut by a turfing spade; and we then discovered that the roots of the grass had been eaten away by the larvæ of the cockchafer, which were found in countless numbers at various depths in the soil. The field was visited by a great quantity of rooks, though there was no rookery within many miles of

the neighbourhood, who turned up and appeared to devour the grubs with great satisfaction.’” To prove their utility on other occasions, two or three quotations from the “Magazine of Natural History” were given. “An extensive experiment seems to have been made in some of the agricultural districts on the continent, the result of which has been the opinion that farmers do wrong in destroying rooks, jays, sparrows, and indeed birds in general, particularly where there are orchards. In our own country, on some very large farms in Devonshire, the proprietors determined a few summers ago to try the result of offering a reward for the heads of rooks; but the issue proved destructive to the farms, for nearly the whole of the crops failed for three successive years, and they have since been obliged to import rooks and other birds to re-stock their farms with. A similar experiment was made a few years ago in a northern county, particularly in reference to the rooks, but with no better success. The farmers were obliged to reinstate the rooks to save their crops. In speaking of the continent, I ought to have added that the Chamber of Deputies in France lately passed an act to prohibit the destruction of birds in a particular district. They had been recklessly killed off, and the consequence was that the harvest was destroyed in a green state by myriads of reapers in the form of hungry insects. A well-authenticated historical fact is related by Mr. Waterton, the venerable naturalist. The American colonists got it into their heads (in New England Province) that the little crow was a terrible destroyer of their crops, and a reward of 3d. a dozen was offered for its destruction. The useful race of birds was extirpated, but what followed? The insects, no longer checked, caused the total loss of the grass; and in 1749 the colonists were obliged to get hay from Pennsylvania, and even from Great Britain. Then the inhabitants would willingly have given twice as much to bring back the tribe of birds. Other instances of a similar nature are on record. Rooks, also, eat grain, and during the seed time the early-sown grain requires to be watched to keep the rooks away. They will also occasionally steal a few cherries and green walnuts, and in severe weather peck holes in turnips or potatoes. There is reason, however, to believe that the visits of rooks to turnips are beneficial. Farmers have suffered great injury of late years, particularly it appears in Hertfordshire and Essex, from the attacks of the large brown grub, the larvæ of a very common grey moth called the corn rustic (*Agrostis segetium* of entomologists), from four to seven of which I have known to be found eating their way into the bulb of one turnip. These the rook eats and keeps under, as it seems his province to do. ‘Whenever,’ says Mr. Waterton, ‘I see a flock of rooks at work in a turnip field, which in dry weather is often the case, I know that they have not assembled there to eat either the turnips or the tops, but that they are employed in picking out a grub, which has already made a lodgment in the turnip.’ In short, it appears, that after making the largest probable allowance for their destruction of a portion of the crop of which they preserve the rest, they are still the cheapest labourers employed upon a farm. And it is a great mistake to regard every creature as an enemy and rival that tastes the food we make use of. We must not forget the sparrow, our smaller enemy. Mr. Knapp, in the ‘Journal of a

Naturalist,' after describing the sparrow, says — 'I have called them plunderers, and they are such; they are benefactors likewise, seeming to be appointed by nature as one of the agents for keeping from an undue increase another race of creatures, and by their prolificacy they accomplish this. In spring and the early part of the summer, before the corn becomes ripe, they live on insects, and their constantly increasing families require an increasing supply of food. We see them every minute of the day in continual progress, flying from the nest for a supply, and returning on rapid wing with a grub, caterpillar, or some reptile, and the numbers captured by them in the course of their travels are incredible, keeping under the increase of these races, and making ample restitution for their plunderings and thefts. When the insect races become scarce, then the corn and seeds of various kinds are ready, their appetite changes, and they feed on these with undiminished enjoyment. As a proof that the produce of our corn-fields is not the only food on which sparrows subsist, we may point to the same tribe of birds in London, where thousands of them exist, to whom corn must be little known. But a London sparrow requires to be well cleaned before the true colour of his plumage appears. If one of these begrimmed soot-collectors be placed near a bright trim sparrow from a barn door, it is difficult to calculate that the rustic and citizen are birds of the same feather. But it may be necessary to show that the evil to be met is as great as has been represented; that the ravages of insects would, if unchecked by the birds, be of so serious a nature. Let me observe then that the generation and growth of swarms of insects is rapid, almost beyond credibility. But we have proof of their prodigious increase. Take the flesh-fly for instance. He is an indefatigable scavenger, and it is well he is so. A small mass of decaying flesh sends forth an intolerable stench, and if all the animal matter which it casts upon were left to accumulate, it would not only affect our senses but our health also, were it not for the millions of busy beings whose business it is to clear the putrifying mass away. The flesh-fly covers its nutriment with millions of eggs. These eggs turn to maggots in a couple of days. They increase their weight 200 fold in 24 hours, and their voracity is such, that Professor Owen states that there is no exaggeration in the assertion made by Linæus, that three flesh-flies would devour the carcase of a horse as speedily as a lion would. Then these flies serve another office in the economy of creation; besides cleansing away putrid matter, they serve for the food of numberless birds. They feed

upon death; and having sported their hour, find their end in the stomach of the living bird. Mr. Rowell calculates that but for this check flesh-flies would in six generations produce flies sufficient to cover the whole earth to a considerable depth. It is only lately that the habits of birds have been accurately observed, for even the father of English natural history, Gilbert White, held mistaken notions about the small birds. In his 'History of Selborne' he says, 'the willow wren are horrid pests in a garden, destroying the pears, cherries, currants, &c.' The Hon. and Rev. W. Herbert says this sentence of White's has been the cause of murder of these most innocent little birds, which are in truth particularly the gardener's friends. Many are under the impression that they make great ravages among the cherries, yet I can assert that they never taste the fruit. They peck the aphides, which are injurious to the fruit trees. I have seen them pulling the leaves of the cherry tree so near the fruit that any person might be deceived, and think they were eating it, but they were actually pulling the insects from the leaves. They feed on the lice, which seem to have been intended by Providence as food for these little soft-billed birds, the gold-crests, and many others. The question for discussion does not call for a view of the subject on the score of humanity; nevertheless I would trespass one minute longer to express my agreement with an anonymous writer of the present day, that there is not one of the motives to cruelty which operates so widely as unmixed wantonness without any sort of object. Nothing is safe, provided it be small enough to destroy, which approaches within reach of many people's hands or feet. To see a living thing and desire to kill it, are with them inseparable acts. Mr. Darwin tells us that on some of the islands he landed on in the Pacific, the birds are so tame they can be struck with a stick, and that the sailors, as they wandered through the woods in search of tortoises, took a wicked delight in knocking the poor confiding birds on the head and leaving them to rot. 'Assuredly,' says the writer I spoke of, 'Providence has done nothing without an object; and is it to be supposed He contrived creatures who, like ourselves, are fearfully and wonderfully made, and breathed into them the breath of life, merely that we might beat out their brains by random blows as we pass along? Here is a wonderful assemblage of animate nerves and blood-vessels, and digestive organs, beyond even our power to comprehend, and can it possibly be the end of their creation that we should ignorantly crush them like a piece of dirt?'"

AGRICULTURAL IMPLEMENTS, AND THE PRIZE SYSTEM.

The principal implement makers, a few years ago, formed themselves into a company, called "the Association of Agricultural Engineers." It is from this body, we believe, that all the organised opposition to money prizes has emanated. The great majority of the exhibitors of implements at the Royal Agricultural Society's shows subscribed their names to a memorial, which was addressed to the Council, praying for an abandonment of annual trials, and also for the abolition of all money prizes. The Council very wisely divided the implements into three classes—[the division is now extended to four]—one of which was to be tried in each year, and they still more wisely determined to retain the money prizes and competitive trials. They, however, attended to many suggestions as to the way in which these prizes should be adjudicated, and these trials conducted. As the evils of the old

system have been very ably exposed by Mr. Howard and others, it may not be uninteresting or unprofitable to glance at some of the chief objections which are still urged against implement trials in general, and the Royal Agricultural Society's prizes in particular.

By way of preface, we would observe that all this hostility to money prizes comes almost exclusively from those engaged in the implement trade. No doubt prizes are bothering things; they satisfy only one maker, while they disappoint dozens. The man who secures the second prize thinks he should have had the first, and all the rest of the defeated aspirants consider they should have had some share of the spoil, or some word of commendation. The fortunate winner is not exactly a happy man; he is always dreading the defeat that may await him next year by some competitor improving his

machine, and catching a wrinkle or two from his success. So his laurels sit uneasily, lest they should be soon snatched from him.

There is no good in looking back 12 or 15 years, to rake up every mistake that implement judges have made, or to criticise the hurried and imperfect trials which were then common. The subject in those days was not well understood, and of course errors of all sorts have occurred. But we will confine our remarks to what has taken place during the last four or five years, and while we readily admit that the system as now adopted by the Royal Agricultural Society is by no means perfect, and is capable of still further improvements, we think we shall show that the prize system has, during that period, been of very great service to the farmers of England.

One of the chief accusations against the prize system is, that it creates an "unhealthy mania for something new"—"a straining for novelty, and a restless desire for change." If, as some manufacturers assert, many implements are perfect, of course it is useless to try to improve them; but where is that agricultural machine to which we can point and say, it is in every respect perfect? We might single out the Banbury turnip-cutter. This very excellent machine has been but slightly improved since it was first introduced, and has, when competing as a slicer of roots for sheep, stood unrivalled. Then let it take its prizes and wear its medals till another and better machine can be produced; and should that day ever come, the farmers will at once know it from the trials of the Royal Agricultural Society, and will buy the improved machine as readily as they have patronized Mr. Gardner's useful invention. But it by no means follows that because an implement is altered, that therefore it is improved; nay, more, the general result is, that if the original be very good, the second edition does not answer. "Let well alone" is a first-rate maxim, even in prize implements, for alterations too often increase complexity, while nothing so delights the eye of a practical judge as simplicity. No doubt there are all sorts of dodges to secure prizes, and catch the public gaze, which gloats over any novelty; but they will not go down with the plain farmer-judge, though they may be extolled and brought into notice, as something really very clever, by a learned theoretical steward. However, we can confidently assert that during the last four years no one can mention a single prize implement at any of the great shows that is not well adapted for the every-day purposes of the farm, nor point out a novelty which has received a certificate of merit that is not a useful and meritorious invention. If there be any fault now, we think it is that the judges are rather too cautious in praising a new implement, and seem inclined to give it a timid commendation, rather than a gold medal or special prize. One great object of prizes is to direct the farmers' attention to the best machine and implement of its class; and surely Howard's ploughs and harrows, Coleman's scarifier, Garrett's and Hornsby's drills, Clayton and Shuttleworth's thrashing machines, Tuxford's portable and Barrett's fixed engines, are the best of their class, though there may be others that have received commendations, which, of course, are very good and very useful machines.

But, say the opponents of the prizes, these awards have been given so hurriedly that there has been no time to really prove the capabilities or find out the defects of the machines. These remarks do not apply now. The trials, which formerly occupied three or four days for all the implements, were last year extended over eight days for only one-third of the former number. And surely a jury, formed of some of the best practical farmers this kingdom can produce, aided by excellent engineers and men of sound science, with all the appliances and means to boot for proving and testing machinery, must find out the

merits of a machine with greater exactness than any one can hope to do among the bustle of the show-yard, or from the laudatory remarks of the maker. Persons unacquainted with the trials of implements at the Royal Agricultural Society's shows have but a slight idea of the exacting tests that are applied. There is the steam break, the gauge, the dynamometer, and what not; so that, in awarding prizes to implements, the judges have not much chance of following their own fancy, as they cannot disregard the demonstration of these tests. Of course, simplicity, cheapness, durability, good workmanship, and the like, come in for their share of reward; but all these qualities are more easily reduced to a certain rule than the points of a cow or the form of a horse. However, if a wrong award is made about cattle, the people only fancy there is a mistake, and the matter is not long remembered; but if an error is made in an implement prize, it is *proved* to be wrong, and the mistake is hardly ever forgotten.

It is contended that other branches of national industry flourish and increase without the aid of this "artificial stimulus." But at all shows and exhibitions there are prizes, or medals, or certificates, or honourable mentions, or some honorary reward. Government, if it require a design for a monument, or a plan for public offices, offers a tempting prize. Now, we can see no sort of good that would result from substituting certificates for money prizes for agricultural implements. What harm does the cash do? The great makers, the chief leaders of the opposition, do not want a £10 or £20 prize; but to the smaller men such a sum does not prove altogether unacceptable. The old argument, that too great a distinction is made between two nearly equal implements, when one has the prize and the other is merely commended, has lost much of its force. When there was a certain fixed money prize offered for, say, the best harrow, the judges could not divide the prize, but had to give it all to that which they thought the very best. But now that there are £15 or £20 to distribute among the class of harrows, the judges have bracketed two implements for the first or second prizes, and have sometimes even divided the sum pretty equally among two or three of the best makers.

To expose the inefficiency of the prize system, the conflicting awards about the reaping machines are constantly quoted. Now these awards were made by one set of judges, and it is not often that men like to contradict themselves, so we may suppose they had good reasons for reversing their decisions. It happened that the best machine in 1855 was not the best in 1856, yet the 1855 machine was so improved by 1857, that it again bore off the first prize, and will certainly hold that superior position until the other machine makes another step towards perfection, or a better one is invented.

Then, manufacturers complain of the expense of these competitive trials, and say that the farmers are the sufferers, as they eventually pay for all this. Of course they do; and so they do for all the expenses the exhibitors are at; for all the time spent by masters and men at these shows—for all the cost of transit—for every grand letter of the emblazoned name—for every word of the stupendous catalogue—for every dab of that soft blue paint, and every drop of that brilliant varnish. But what really is the extra cost of the trials over and above the ordinary expenses of exhibiting implements? The Society find horses, coals, corn, straw, and every material for the trials; all that the exhibitor has to do is to furnish hands, and these would most likely be wanted for the arranging and selling the articles at the stand. We remember, at Chelmsford, where there was no prize offered for steam engines, that one celebrated firm built up a large brick chimney, to show off their fixed engine. Now what was the cost of that chimney, compared

with the cost to those manufacturers of the Society's trials at Chester last year?

Again—can we, in cheaper implements, gather any fruits from triennial instead of annual trials? Mr. Howard has not entered the lists with his matchless ploughs for three years. He tells us that the cost of these trials is paid by the pur-

chasers of his ploughs "by an extra per-centage." Has he reduced his price one shilling now that he has escaped this expensive ordeal for three years, and everything is cheaper now than it was then? At any rate, we hope he will not make us pay any more after he has passed through the dreaded Warwick trials next July.—*Oxford Journal*.

SALE OF CORN BY "THE CENTAL."

It is only a winter or two since, that the grave men of Liverpool, by way of a little agreeable relaxation, took to snowballing each other. They entered, indeed, with so much energy into the amusement, that from playing they very nearly came to fighting; and, if we recollect aright, the police had ultimately to interfere. Unfortunately for either children of a larger or a smaller growth, we have had no winter this year, and hence the staid merchants of that thriving city have had to look about for some other as congenial a pastime. They have been not very long in finding it, and are just now in the midst of some such another civil war. This would threaten, however, to be a more serious matter. In place of the yielding melting snow, the good people of Liverpool have laid their hands on far more massive missiles. They are pelting one another now with weights and measures, and throwing bushel-baskets and dangerous centals straight at each other's heads. Business of course is necessarily interfered with, and the dispute is said to be daily becoming more personal and belligerent. Authorities have declared that, in a row, a man may do a deal of mischief with so simple a weapon as a pewter pot. A sharp-edged, well capped bushel-measure, or a nicely poised hundred-pound-weight, might be even still more effective; and it is really time to look out. Let the skirmish only get a little hotter, and we shall have the police driven back, the military sent for, and the Riot-Act read.

The difference began in this wise:—For some time past both the buyers and sellers of corn have almost everywhere been insisting upon the necessity of some uniformity of weight or measure. So far, it would have been impossible to have had people more unanimous. But in the detail, however, of how this is to be arrived at they are seldom so readily inclined to agree. In fact, they rather agree only to differ. There is scarcely a speaker at a meeting, the writer of a letter to a newspaper, or a person you get into conversation with, on the subject, but has some pet plan of his own. In that memorable discussion at the Central Farmer's Club but a year since, upon this very question, most of the members who voted either with Mr. Wallis or Mr. Skelton, still did so under a kind of protest. Every one had something to propose he fancied a little better; and had the Chairman only been willing, he might have gone on putting resolutions the whole night through. Then one local meeting suggests this infallible system of uniformity, and another is equally urgent as to the merit of something diametrically opposite. In the meanwhile the Government looks on complacently enough. It will wait of course until

these good folks have quite settled amongst themselves what they do want, and then it will be time enough to talk to them.

In this dilemma the merchants of Liverpool have come to the rescue. They have voted themselves judge, jury and arbitrators, and kindly consented to decide the point. With the simplicity of true genius, they have unravelled this Gordian knot by one straight cut at it. Weight is preferable; and, after the 1st of February, we buy and sell by weight only. We call this weight the Cental, and we hereby command all other markets to adopt it. Naturally influenced by so high an authority, other places at once succumb. Glasgow calls a meeting, and is declared unanimous. Hull does something of the same sort, and it straightway gets abroad that all the great towns are in favour of the cental system. "Only look," as people say, "how well it is working in Liverpool!" And, when we do look, it is nothing but the old story over again. The Cental even here, in the land of its birth, has quite as bitter enemies as it numbers warm friends. The merchants of Liverpool, who forwarded us their decree are now formally protested against as not representing the merchants of Liverpool, and their proceeding is said to be "merely the work of a few individuals, some of them not connected with the trade at all." In a word, from the letters we have lately received it would appear to be but another reading of the Three Tailors of Tooley-street. Glasgow, too, has revolted; and Hull already "gives the new weight the slip." All this, however, is scarcely more than could have been expected, when we find the law-givers have no power over their own subjects.

On first hearing of this movement, we still pointed to the Government as the only proper quarter from which any such step should emanate. "It is very evident," we then wrote, "something 'official' must be done, otherwise we shall have other great markets rooting up all custom, and, like Liverpool, making laws for themselves. It can scarcely be expected that they will quite agree as to the best system, and so with a new method here and another there, we shall have 'confusion worse confounded.' It is high time for the Government to interfere." We can really do no better than repeat this. What we so clearly anticipated has already come to pass, and taking Liverpool itself as the example, we have "confusion worse confounded." Even admitting the right or policy of any private body of men attempting to make laws for the whole country, we should question very much whether the best plan has been here hit upon. There could cer-

tainly be none with which the general body of buyers and sellers were *less* familiar. However good the decimal system may turn out to be, it was hardly prudent to commence it on so vexed a question as the buying and selling of corn—a branch of trade that it has been, perhaps, less associated with than any other. We are strongly inclined to trace this resolution back to some enthusiastic student of the currency question—an intricate business, that has led to more wild talk, if not work, than almost anything else to which a man could devote himself. But if we are to give our “ten-pennies” for hundred pound weights, the country, we fear, will require something far more unanimous than this edict of the Liverpool Association to enforce such an alteration in our habits and customs.

A series of letters received on this subject, are all noticeable as arguing the same way. The first of these, from a Liverpool merchant, describes the present state of things there, as brought about by the recent resolution:—“In this market, sellers and buyers are now, to a great extent, in hostile array on the subject. One will sell by the Cental only; another is equally firm in refusing to buy, except by the former weight. Declarations and counter-declarations have been signed and published; and each party, as usual in such cases, claims the preponderance in influence and importance for the subscribers of its manifesto. The struggle seems to wax hotter daily, to the great interruption of business, and almost approaches, if it has not in some cases reached, personal hostility. Nothing can show more strongly than this the necessity for legislation; and, indeed, it must appear to your readers extraordinary that so many of the leading corn merchants of the large and influential port of Liverpool should have shown so little practical knowledge of the world as to attempt the important step of changing, not only the long-established customs, but the settled and legalized practices of the country, without all the assistance which it is in the power of an Act of Parliament to afford.”

Then Mr. Moss, writing from Manchester, says—“I believe there would not be more than one in every ten of the corn trade in this city in favour of the new scheme. I myself think it a bad one, inasmuch as it is impossible to get a test of quality in any other way than by measure; therefore the measure cannot be abandoned.” And for a third, a whole army of merchants and factors from Liverpool, enter a formal protest against sale by the Cental! We have already intimated that Glasgow has recanted, and other towns more quietly withdrawn from the new scheme to which they had momentarily committed their markets.

There is but one inference to be drawn from all this. Everything tends to show how desirable it is that Government should at once take up the question. Any honourable member who would devote himself to its consideration might do a great public service, as well as earn for himself some merited popularity. It might, perhaps, be as well, in the first place, to ask for a Committee, although the only advantage of this would be to test one man's experience and opinions by those

of another, and so to arrive at the most *feasible* plan. We repeat that it would be hopeless to count on anything like unanimity from the witnesses called. But the country generally is so sick of the present systemless system, and consequently so far ripe for a change, that almost any uniformity that came out under the sanction of the Government would be certain of welcome and respect—even were it simply the better to *maintain* the use of the imperial bushel. With the Country Party in office we should hardly be driven to Liverpool for legislation.

HOMŒOPATHIC TREATMENT OF BLACKLEG IN CATTLE.

SIR,—As no cure appears yet found for this disorder in cattle, I am induced to send the following account of treating a case, which, if not blackleg, was very like it. Ten years ago I had five or six cases, which being treated by a cow-doctor, all died; since then I have been free from it until last June, when one of my yearling steers was found in the morning very lame and off its feed; one hock was swollen, and the stockman pronounced it blackleg. At 10 a.m., when I first saw it, the disease had made rapid progress; the swelling was extending rapidly upwards; the skin over the part chiefly affected had, when touched, a peculiar crackling sensation, like parchment; one knee was also a little filled; the animal could scarcely stand, and lay down again immediately it was left alone; the eyes were staring; respiration quick and interrupted, and the muzzle with that peculiar grin which animals have when in pain.

I gave it immediately aconite (3rd dilution) 2 drops, in an ounce of water, and in an hour's time repeated the dose; an hour after the second dose, bryonia (3rd dilution) 2 drops, also in water, and then continued aconite every 2 hours until night, when about 10 o'clock another dose of bryonia was given. Towards evening the animal became much easier, and towards 7 o'clock got up of its own accord, and ate a little mash and hay. The next day it was much better; and in about 10 days was turned out again quite well, as it has continued ever since. The second and third days he had aconite at 6 and 11 a.m. and 4 p.m., and bryonia at 8 a.m. and 8 p.m.; after that 2 drops sulphur to a dose, morning and evening for 3 days, then only every morning for 4 more days. The remedies are so inexpensive that they are worth trying by any person whose cattle are afflicted with this disorder.

The medicines bryonia and aconite of the 3rd dilution and sulphur of the 6th are to be procured from any homœopathic chemist, in bottles of tincture 1s. each; so for 3s. the experiment may be tried, and if it fails we shall only be where we were before. A medical man recommended me to substitute arsenicum, 5th dilution, instead of bryonia, should I not be successful in other cases.

I should say that in the above case the animal recovered so rapidly, that had it not been for the skin adhering to the first rib for 8 or 9 days, I should have thought the swelling might have arisen from some injury such as a sting.

I enclose my address, which may be had by applying to the editor of the paper. Should any readers of the *Mark Lane Express* try the above remedies, they will confer a great benefit to the proprietors of animal, if they will kindly send the result of their treatment to your paper.

Dec. 28, 1858.

CALENDAR OF AGRICULTURE.

Sow oats and barley on dry lands, and during dry weather; also Spring wheat, vetches, peas, beans, and flax-seed. Sow lucerne on well-prepared land, trenched, or very deeply ploughed, and richly-dunged. Sow carrots and parsnips—best on good warm sandy loams, in good condition from previous usage, without the present application of fresh manure, or applied in Autumn, and ploughed underground. Steep the seeds in leys of urine, and dry them with lime. Sow sainfoin, and dress the young plants with gypsum. Apply artificial manures as top-dressings on young wheats, barleys, and clovers—soot and salt, mali-combs, rapedust, nitrate of soda, pigeons' dung, and gypsum. Sow cabbage-seeds for Summer-plants; and lay composts on grass lands.

Plant hops in hills six feet distant each way: use well-rotted dung, and place four sets in each hill—one in each corner, and cover lightly with earth, leaving the upper end of the set just in light of day.

Continue the planting of forest trees, and of young hedges; but cease if dry weather sets-in. The cutting of underwoods will now be finished.

Watered meadows may now be stocked with light animals. Set traps for vermin; and spread mole-hills.

Plough fallows for green crops, and clay lands for bare fallows, if the weather be dry. Shut-up the fields that are intended for lay; and finish laying composts on grass lands. During wet weather thrash grains, and carry dung from the cattle yards to the heaps in the fields.

In some, or rather in many, situations this month will be the busiest with ewes dropping lambs. Feed amply with juicy succulent food, as beet, cabbages, and turnips; and use the necessary shelter, which, in many situations, is as necessary as food itself. The shelter-sheds must be littered frequently, to keep them dry—best with chaff or short straws. Remove the ewes and lambs to the pasture-fields from the lambing-paddocks, regularly, as the lambs get strong.

Keep the poultry-houses dry and warm, and set all kinds of eggs for hatching: feed amply, and provide clear spring water.

Finish the killing of hogs for bacon; and keep all young pigs for Summer stores, and for early feeding next Winter. The latest fattening bullocks must now be sold, or pushed forward by superior feeding. The long days will now require a greater supply of food, as daylight always induces animals to eat more.

CALENDAR OF GARDENING.

March is the month of business, and every favourable moment must be seized, because the varied character of the weather is not only likely to perplex, but it frequently happens that drought sets-in, for the Spring, about the third week, and then it will be too late to hope for the success of many of the lighter seeds. Begin, therefore, early to dig, manure, and sow plots for the main crops of peas, beans, and all the summer vegetables, remembering that carrots require pure and very sandy loam, without interspersed manure; that beet and parsnips do well on stronger land, but require the dung to be placed low in the ground.

The soil should be rich for cabbages, Brussels sprouts, broccoli, cauliflowers, and kales. Cauliflowers must have very rich ground, with much manure lying in the trenches below the roots. Guano-water is an excellent liquid manure for them.

Transplant and sow for Summer-hearting cabbage. Sow some Dutch seed of red cabbage, and green-cured savoy, for Michaelmas.

Sow the best French lettuce seeds, round spinach, and repeat this, in small quantity, every three weeks henceforth: in the meanwhile, the Winter prickly-spinach will yield freely for some months, if the weather prove showery.

The true Spanish onions for large bulbs, and the Strasburg for more common kitchen use, should be sown early, in deep and rich ground. 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—a frame and lights are al-

ways advantageous. A sprinkling of Dutch turnip, a little celery for succession. Small salading, nasturtiums for pickle, parsley, basil, and pot-herbs, namely, fennel, dill, borage, burnet, sorrel, are to be sown during the month.

Plant mint, thyme, sage, marjoram, lavender, rosemary, and rue.

Get in early potatoes; none surpass the ash-leaved kidneys; the second early, as the Champion, prolific, and others that ripen in August; and, avoiding manure, select or prepare peaty or sandy ground, if possible. The disease prevails less on poor dry soils than on richer grounds; thence the mildew may constitute a cause of the disease.

FRUITS.

Prune fruit trees and currant bushes; mulch the roots, and prepare the Summer-growth. Dig the ground between the rows, and cover with compost of leafy dung. Do the same round the rhubarb plants.

FLOWERS.

Sow hardy annuals after the middle of the month, as pinks—including the Indian kind—larkspur, and mignonette: the half-hardy are raised in frames. Herbaceous plants may be set or divided, and put into new situations.

Cut box; plant edgings; turn over gravel, or put down fresh; sweep lawns; and keep all things in a neat clean order.

Have a pit, bricked or cemented, to receive all vegetable refuse, straws and horse-droppings—baled over by liquids and soap-suds from the kitchen. A good manure may be got by careful collecting.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR
FEBRUARY.

The continuance of remarkably fine weather has had a beneficial influence upon agriculture generally. In all parts of England outdoor farm labours are very forward; and the almost continuous light showers of rain have produced a more abundant supply of water, the scarcity of which had long been felt, especially in the midland counties. As regards the general appearance of the young wheat plants, we may observe that it is favourable, notwithstanding that in many counties the plants stand in need of frost to keep them in check. As yet, however, it has not been found necessary to eat them down to protect the crop.

The wheat trade has continued in a very unsatisfactory state. Consumption is progressing steadily; nevertheless prices have shown a disposition to give way, arising in some measure from the total want of speculation, but chiefly from heavy stocks in the hands of the home-growers, and the prospect of extensive importations from France as the year progresses. At present there are no indications of an improvement either in the demand or value; and, as far as our judgment carries us, there is no chance of high quotations during the whole of the year in the event of our crop turning out a fair average one. Potatoes and rice—two important articles of consumption—are still competing with wheat, at low prices; and there is no disposition on the part of the millers to purchase wheat beyond immediate wants. Although some extensive supplies of barley have come in from abroad, the demand for that grain has continued steady, at full currencies. Fine malting samples have been very scarce; consequently they are selling at comparatively high rates. Oats, beans, and peas have varied but little in price, and the demand for them has ruled steady.

Our leading cattle markets have been but moderately supplied with fat stock, in which a steady business has been transacted, at slightly improved rates. The slaughtering of stock for London consumption in Scotland and elsewhere is still carried on extensively.

Owing chiefly to the unfavourable state of the political horizon on the continent, the wool trade has been much less active, and in some cases prices have been with difficulty supported; however, the trade may be considered in a healthy state. The public sales now in progress will to some extent regulate the value of wool for some time. The new clip is turning out extremely well; but the stocks in the hands of the flock-masters are nearly all worked up, and we see no reason to anticipate large importations during the year either from abroad or our colonies. The quantity of wool now in London is about 34,000 bales.

There has been a moderate, but by no means active, demand for hay and straw, the prices of which have ruled about stationary. Meadow hay has changed hands at £2 15s. to £4 10s., clover ditto £3 10s. to £5 5s., and straw £1 4s. to £1 9s. per load. Full average quantities of meadow hay are still in stack, and the export demand has almost wholly ceased.

The root crops are lasting better than was at one time anticipated; yet the demand for linseed, rapeseed, and cakes has been rather extensive, at very full prices. Present quotations appear safe, when we bear in mind that the importations of linseed from our colonies, as well as from Russia, are not

likely to be in excess of last year, during which the arrivals were very moderate.

Great inactivity has prevailed in the demand for wheat, maize, and some other articles, in Ireland. In prices, however, very little change has taken place. Oats have ruled a shade lower; and we may further remark that the shipments of grain, &c., to England have continued on a very moderate scale, even for the time of year. The exports of stock, however, have been seasonably good.

Nearly the whole of the Scotch markets have been steady for fine wheat, barley, and oats. Meal, too, has been rather firm in price; but other articles have commanded very little attention. The exports to the South have continued liberal; and we understand that farmers still hold more than an average supply of wheat, inferior barley, and oats.

The total stocks of foreign grain and flour in warehouse in the United Kingdom are estimated at 1,400,000 qrs.; a quantity sufficiently large to exercise much influence upon value, although very limited importations are anticipated this year from the United States.

REVIEW OF THE CATTLE TRADE DURING
THE PAST MONTH.

Compared with many previous corresponding periods of the year, the supplies of fat stock on offer in the Metropolitan Cattle Market, during the month just concluded, have been only moderate; and as regards the beasts, in but middling condition. Nearly all kinds of sheep, however, have appeared of full average quality; consequently, the actual weight of mutton disposed of has rather increased than otherwise. Notwithstanding that very large supplies of meat, slaughtered in Scotland and various parts of England, have been received up to Newgate and Leadenhall, the demand for stock has continued steady, and in some instances prices have had an upward tendency. The high value of hides, skins, wool, and offals, in various distant parts of England, has no doubt checked arrivals of live stock; but, on the other hand, it has induced many parties to slaughter for consumption in the metropolis. The quantity of meat now daily consumed in London is fully equal to, perhaps considerably in excess of, most previous seasons, and our impression is that it will continue very large for some time, as trade and commerce continue to flourish, and as our artisans almost generally are well employed. Increased consumption cannot fail to have considerable influence upon prices, and apparently those now ruling may be taken as the standard for the greater portion of the present year. If we were in a position to believe the whole of the reports which have come to hand to the effect that a great scarcity of stock exists in nearly all parts of the United Kingdom, higher quotations, even with open ports, might be anticipated; but such a conclusion might lead to erroneous calculations on the part of the breeders and graziers: consequently, losses might result from our taking too sanguine a view of the trade. Higher quotations would, in the ordinary course of things, lead to increased importations from Holland and Germany, which from their increased weight—we here refer more particularly to sheep, which of late years have undergone the usual process of crossing with our best native breeds—may eventually have a greater effect upon prices than appears to be generally

imagined. Not that we anticipate low prices from importations; but we may fairly state that increased weight of meat from abroad must keep in check extravagantly high rates here. In our leading grazing districts the health of both beasts and sheep continues good, and the losses by disease for some time past have been comparatively trifling. The weather has continued remarkably fine for the time of year; nevertheless, the pastures generally exhibit a poor appearance.

The following return shows the numbers of stock exhibited in the Metropolitan Market in the course of the month:—

Beasts	17,694	head.
Cows	499	"
Sheep	79,691	"
Calves	1,034	"
Pigs	2,557	"

COMPARISON OF SUPPLIES.

Feb.	Beasts.	Cows.	Sheep.	Calves.	Pigs.
1858.....	18,276	466	69,070	1,091	1,559
1857.....	17,629	457	74,430	1,172	1,975
1856.....	19,642	495	99,950	673	2,614
1855.....	17,436	385	91,180	596	2,705
1854.....	20,091	520	92,441	1,023	2,279

The arrivals of beasts from Norfolk, Suffolk, Essex, and Cambridgeshire, since we last wrote, have amounted to 10,500 Scots, short-horns, and crosses; from other parts of England, 4,000 of various breeds; from Scotland, 1,826 Scots and crosses; and from Ireland, 120 oxen, &c.

Although stock is still dear in most parts of the Continent, the importations into London have been moderately extensive, viz.:—

Beasts	1,630	head.
Sheep	5,124	"
Calves	1,055	"

Total	7,809	
Same time in 1858	2,320	"
" 1857	4,720	"
" 1856	3,087	"
" 1855	2,839	"
" 1854	10,683	"
" 1853	12,433	"
" 1852	9,123	"
" 1851	11,828	"

Beef has sold at from 3s. 2d. to 5s.; mutton, 3s. 6d. to 5s. 6d.; veal, 3s. 10d. to 5s. 6d.; and pork, 3s. to 4s. 2d. per 8lbs. to sink the oil. In February, 1856, beef realized 3s. to 4s. 2d.; mutton, 3s. 2d. to 5s. 2d.; veal, 4s. to 5s.; pork, 3s. 2d. to 4s. 6d. per 8lbs.

A few lambs have made their appearance in the market, in excellent condition. Shorn sheep have sold at 8d. per 8lbs. beneath those in the wool.

Up to Newgate and Leadenhall about 50,000 carcasses of each kind of meat have been received from distant parts, chiefly by railway. On the whole, there has been a good consumptive demand at full prices. Beef has changed hands at from 3s. to 4s. 6d.; mutton, 3s. 2d. to 4s. 8d.; veal, 3s. 8d. to 4s. 8d.; pork, 2s. 6d. to 4s. 2d. per 8lbs. by the carcase.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

ASHBOURN FAIR.—There was but a small show of cattle, and very few customers, owing to other fairs falling on the same day; anything good, however, sold well. There were a few fat sheep, which were easily disposed of, making 7d. to 7½d. per lb. But few horses, and sales flat. Mr. Tomlinson, of Bradley Pastures, exhibited a most remarkable short-horned bull, weighing one ton, which he had previously sold for £32 10s.

BANBURY FAIR.—There was a good supply both of beef and mutton, which went off briskly. Beef fetched from 4s. 6d. to 4s. 8d., and mutton about 5s. per 8lbs. on the average prices.

BATH FAIR.—The supply of poor stock was so extensive as to be quite a drug. Prices were of the most extensive range. Fat beef and mutton were in very short supply, and

the demand being of a very limited description prices were quite nominal.

BEDALE FAIR.—We had a small show of all kinds of stock, owing probably to Northallerton beast fair being held the previous day. In-calfers and lean stock were high. Sales were quickly made. Beef, 7s. to 8s. per 8 lbs.; mutton, 6d. to 7½d. per lb.

BIDEFORD FAIR was far better supplied with stock than it had been for years past. Cattle dealers drove in their cattle in large herds, and the facilities which the rail offers brought many buyers. Cows and calves, 10s. 6d. per acre; steers (two years old), £18 per pair; steers (three years old), £23 per pair; barreners, 7s. to 7a. 6d. per acre; hoggets, 26s. to 30s.; fat sheep, 6½d. to 7d. per lb.; couples, £2 2s. to £2 5s. The whole was in middling condition, and sold freely.

CARLISLE HORSE FAIR could not be called a thin one, as there was a number of good animals shown. The market was not very brisk, yet a good deal of business was done in the course of the day, and many horses were disposed of at high prices. Among those shown we did not observe a single hunter, carriage, or harness horse, there being only three moderate blood horses, suitable for carrying a lady; we may say the fair consisted of work horses. The prices for the best horses were from 30l. to 50l., and those of inferior quality from 15l. to 25l. An eminent horse dealer from Glasgow, having been in Cumberland for two or three weeks previous to this fair, purchased 21 all-work horses, of the best quality, the cost averaging nothing less than from 40l. to 50l.; and one at Carlisle, previous to leaving, 46l.

DORCHESTER FAIR.—The best beasts readily found purchasers at from 11s. 6d. to 13s. per score, while cows and calves were anxiously inquired after, prices ranging from 10l. to 16l. The sale of barreners was rather slack in consequence of the high prices asked, which checked business, and rough ones could scarcely find purchasers. In the horse fair there were plenty of good animals adapted to agricultural purposes, the best descriptions of which sold at from 33l. to 40l., but inferior were quite a drug. In pigs there was not much done, and the supply chiefly consisted of such as were more fit for the sty than the butcher.

EXETER FAIR.—There was a large supply of cattle. Fat beef, 10s. to 10s. 6d. per score; cows and calves, 12l. to 18l.; barreners, 6s. 6d. per score; working oxen, 15l. to 20l. each; and steers, 10l. to 15l.

KANTURK FAIR, Feb. 17.—(From our own correspondent).—There was a very good attendance. The show of horned cattle was only middling, and the prices being low a good clearance was effected. Sheep and pigs were in great quantities, and good prices were obtained. The fairs held in this town are now becoming important, and no better opportunity can be had of disposing of cattle to the numerous farmers around this locality, where good breeds are much wanted.

YORK FORTNIGHT MARKET.—Calving and dairy cows were in about equal supply and demand, at prices steady upon late markets. A moderate number of all kinds of grazing beasts had good sale, at rates a little in favour of sellers. Fat beasts and mutton sheep were in average supply and demand. Beef 6s. 6d. to 7s. 6d. per stone; mutton 5½d. to 6½d., and in rare instances 7d. per lb. Grazing hog sheep were plentiful, and had good sale at 25s. to 45s. per head, as per breed, size, quality, and condition. A good supply of pigs, which had fair demand. Pork pigs 6s. to 6s. 3d.; bacon ditto 6s. per stone, including the head and feet. Pork hams realized former prices.

IRISH FAIR.—GRAIGUE (CARLOW) was well supplied with stock, and the demand for all descriptions was brisk; in fact, nothing left the fair unsold worth notice. Springers brought from £12 to £18. Beef sold at £3 per cwt.; in one case a farmer refused £30 for a fat cow, and subsequently lost his market for this high figure. Store cattle much in demand; two year old heifers sold at from £6 to £9, strippers £8 to £10, three-year old bullocks £9 to £11, calves £1 to £5. Sheep scarce, and in request, and brought from 6½d. to 7d. on their legs. Mr. James Dowling sold a lot of prime widders at 47s. per head, and a lot of six fat sold at £3 per cwt. Pigs sold from 42s. to 45s. per cwt., being about an advance of 4s. during the past week. Prices were generally remunerative, stock rating high.

REVIEW OF THE CORN TRADE DURING THE PAST MONTH.

The month of February has brought with it a fair portion of rain, and lessened the anxieties that were being entertained respecting the future; but a heavy arrear is yet due, and required to raise the wells to their usual height as a security for the summer months; and should the fall be deferred beyond April, much inconvenience must be felt—should no positive injury result. But while the rain has been deficient, the weather has been so mild and the atmosphere so surcharged with moisture as greatly to damage the condition of the wheat thrashed, notwithstanding the fine state in which it had been harvested; and this circumstance happening at the time when a low and unremunerating range of prices has long prevailed has proved quite a calamity to growers, as it has deprived them of the common opportunity of realizing at will. Such, indeed, has been the deterioration of the samples offering on the London markets, that some millers have for weeks together abstained from purchasing; and others, to keep up the quantity of their first-class flour, have been paying 55s. to 58s. per qr. for fine Danzig descriptions for mixing; and these sorts are now in such small compass, both here and in the places of growth, that should the March winds fail in their season, it will be difficult to maintain the high quality of town manufacture. This state of things, with heavy markets in France, has kept prices from the expected rally on the turn of the year; but the current rates in the exporting countries have been little favourable to business with this country, and imports lately have been on a diminished scale, with almost no winter in the Baltic; while American prices remain so much beyond our own, that shipments of flour from France have commenced for New York and Canada, with a very fair margin for profit. The state of politics has not as yet influenced prices, and a pacific settlement seeming more probable than recently, the threatened storm may pass over; but, with the gigantic preparations made by France, Austria, and other countries, should a spark light on the materials prepared, the waste and damage to countries growing corn must soon seriously enhance the value of all sorts of grain and forage.

The deficiency of the fall of rain for the last two years is a circumstance, too, that should not be overlooked. Should this deficiency not be made up, and only an average supply be forthcoming,

will this be sufficient under such circumstances? And should the fall of rain now due be added to an average supply, may it not come too violently or continuously to suit the corn? And, on the other hand, if another year's drought be commenced, will not the crops be in jeopardy? These considerations, we think, should make holders pause before they accept unremunerative rates; but where such an abundance has been reaped, as some affirm, as to make present prices remunerative, the case is altered, and the principle—"Sell and repent," with something in your pocket, may still hold good.

We annex a list of current prices in several places of export: Choice 62 to 64 lbs. per bushel red wheat at Louvain was worth 43s. to 44s. per qr., it being of the same value at Antwerp; new white Belgian 61 to 62 lbs. per bushel, 42s.; 63 lbs. red Mecklenburg wheat at Hambro' was up to 45s. 6d. free on board; 61 to 62 lbs. Holstein, 42s. 6d. to 44s. Fine wheat at Paris only brought 38s. per qr., and flour 29s. per sack. Fine Polish at Amsterdam was quoted 51s. 6d. per qr.: at Berlin the top quotation was 49s. per qr. The rates for the best high-mixed at Danzig were 52s. per qr. free on board, with little offering. Native wheat had risen at Leghorn to 51s. 6d., but good useful Marianopoli could be procured at 39s. to 43s. per qr. Algiers was as high as 46s. for hard native wheat. At Odessa, though business was calm, Polish wheat was quoted 38s. 4d.; and the best Ghirka, 39s. 5d. per qr. Soft Ghirka at Taganrog was worth 33s. 6d.; but the prices at New York for Western red were 46s. 8d. per 480 lbs., and white Michigan 50s. per 480 lbs., which, at 62 lbs. per bushel, equals 51s. 8d. per qr., while the top price of Missouri flour was equal to 50s. per sack, or 10s. above London quotations.

In the present four weeks' review we have included the 31st of January—it being on a Monday, leaving out the last day of February, to be in time for publication.

The first Monday in London commenced on a fair supply of English and short one of foreign wheat. The morning brought but a moderate show of samples from Kent and Essex: those that were dry went off readily at fully the former rates. The sales in foreign were limited, in consequence of the demands of holders, and prices were rather in their favour. Most of the country markets were well

supplied, with little change of value, and some dulness from the quantity offering; but Hull, Spalding, Norwich, and a few other localities were occasionally dearer 1s. per qr. Liverpool, at the first market held on Tuesday, was also firm; but the following Friday was less business-like, though not quoted cheaper, and the trade in town closed heavily.

The second Monday's supply of foreign wheat fit for milling was very small, and exclusively from France; but there was a fair quantity of home growth. The near counties sent up but a moderate show, with a great preponderance of parcels out of condition. The few lots of really fine and dry went off steadily at unaltered rates; but the bulk being rough and damp was not disposed of, though lower prices would have been accepted. The same want of condition being the general complaint in the country, many places—as Manchester, Birmingham, and Wolverhampton—were very dull, while Newcastle, Derby, Lincoln, Leicester, and Nottingham gave way 1s. per qr., Hull, Newmarket, and Sleaford alone sending more cheerful advices. Liverpool, on Tuesday, had a good consumptive trade on full terms; but the business on Friday was retail at previous rates, and London on that day was very dull.

The third Monday had again but little millers' wheat in the foreign supply, with only a moderate arrival of English growth. The quantity from Essex and Kent was short; but this day was remarkable for the very wretched plight of the samples—many years having passed since such a show was on the London market. Dry lots, both old and new, which were very few in number, went off without any reduction in value; but it was difficult to affix value to the bulk then showing, and, of course, very little business was done—town millers being obliged to supply their necessities at the foreign stands, where they had to pay high prices in retail. Much still being offered in the country in the same unsatisfactory state, the prevailing reports were towards decline; Leeds, Boston, and Birmingham noting a fall of 1s. per qr. At Hull the rates were firm, notwithstanding; and so they were at Gainsborough and Worksop. Liverpool was cheaper on Tuesday from 1d. to 3d. per cental, and there was no rally on Friday, either here or in town.

The fourth Monday had a very small supply of foreign wheat, and less than an average quantity of home-growth, the morning's additions being only moderate from the near counties; but with these the over-left samples of the previous week were offering, giving the appearance of a greater quantity than of late. There being very little improvement in the new samples, another dull market was the result, only the lots that were fine con-

tinuing to sell freely; but the foreign trade was somewhat benefited by this state of things, and full prices were consequently realized, there being but few fine Danzig on offer, and indeed but little in store. The country markets subsequently held all proved dull as well as the town trade.

The four weeks, therefore, show no positive decline in the value of fine wheat, and the mean average of the last four weeks shows a rise of 10d. per qr., being 41s. 3d. against 40s. 5d. for the four weeks in January; while the London averages, which give a later view, show 44s. 2d. against 43s. 11d., or a positive gain of 3d. per qr., notwithstanding the deteriorated condition and large sales in the country, which were about 65,000 qrs. beyond the first four weeks in January.

The four weeks' supplies in London have been 28,883 qrs. English, 27,440 qrs. foreign, against 16,141 English, 33,969 qrs. foreign in February, 1858, or a weekly average of 14,081 qrs. against 12,529 in February last year.

The quantity exported has been small, viz., 282 qrs. wheat, 895 cwt. flour. The imports for January into the United Kingdom were 263,299 qrs. wheat, 205,467 cwt. flour, against 342,841 qrs. wheat, 304,688 cwt. flour in January 1858; which shows a diminution of 79,542 qrs. wheat, 99,221 cwt. flour in an open winter.

The flour trade has been very quiet for the past four weeks, with very little change, though dull: 28s. per sack doubtfully paid was the opening price for Norfolks, and they closed at 27s., the town trade not having varied throughout. Prices appear to have sunk too low for further reduction, especially in fine sorts, which are becoming increasingly scarce. The importations from France, though not heavy, have nearly all been at a loss of about 3s. per sack, and it is vain to expect fine qualities from America when their best samples are 10s. above our own. The parcels that arrive from the United States are nearly all quite unfit for the London markets, and Liverpool advices agree with town reports. The supplies in London in four weeks have been 72,276 sacks of country sorts, 6,556 sacks foreign, mostly from France, and only 173 barrels from America, against 75,621 sacks English, 6,611 sacks 7,134 barrels foreign, in February 1858.

The barley trade has almost been stationary, for the four weeks noted. Malting sorts have remained scarce and dear. Stout foreign has not been plentiful, and therefore its value has been kept up; but the low light sorts from Odessa and other Eastern ports, coming freely, have rather fluctuated when arriving in quantity; but their relative cheapness as compared with oats has kept them from declining more than about 6d. per qr., a large consumption still obtaining in mixture with oats.

The four weeks' imports into London have been 12,980 qrs. English, 60,186 qrs. foreign, against 11,382 qrs, English, 43,523 qrs. foreign the same time last year, showing an excess in foreign this month of 16,663 qrs. The imports into the United Kingdom in January were 143,138 qrs., against 94,154 in January 1858. The malt trade has been steady through the month, with scarcely any change in the values.

The four weeks' supplies of oats have been remarkably small, but the late advance in prices and the large quantities in granary have contributed to make business dull in this grain, with a disposition finally to easier rates. So steady have been markets, that on the third Monday, with supplies shorter than for a long period, including only 260 qrs. foreign, there was no liveliness in the trade, dealers being content to work off their stocks, and buying from hand to mouth. Some large transactions, however, have taken place for future delivery in Russian qualities, including some from Petersburg, deliverable in May or June in London, at 19s. 6d. in the river. We think these rates will pay, as Holland and Belgium had only about two-thirds of a crop. Ireland will not send so many this season, and our own crop is deficient. The supplies into London have been in English qualities 1,664 qrs., in Scotch 11,980 qrs., in Irish 6,897 qrs., and in foreign 30,366, giving only a weekly supply of 12,726 qrs., or about half an ordinary average, against 17,264 qrs. weekly in February 1858, while in October last the weekly average was 66,498 qrs. The imports into the United Kingdom for January were, 75,765 qrs., against 61,528 qrs. in January, 1858.

Beans, after long commanding high prices, especially in the sorts fit for splitting, on the last Monday were reduced fully 1s. per qr., with less demand; but few seem likely to come this season from Alexandria, where prices have risen to 30s. per qr. free on board, from scarcity: but as France has a store, and the English crop holds out better than expected, and the demand must reduce as the season advances, there does not seem much prospect of high rates, excepting in retail, as the crop gets used up. The London imports, in four weeks, have been 5,503 qrs. English, 1,148 qrs. foreign, giving an average weekly of 1,663 qrs., against 1,881 qrs. in Feb., 1858. The total imports for January into the United Kingdom were 49,030 qrs., against 42,274 qrs. in Jan., 1858, the increase being French.

Peas have been dull throughout the month, for consumption; but the seed-season has influenced duns and maples favourably, which closed about 1s. higher than they commenced. Boilers, notwithstanding their relatively low price, have been much

neglected, the absence of frost having greatly lessened their use, as well as an increased consumption of lentils; and also from the low prices of potatoes, rice, and bread. The overleft stock of white will probably be used eventually for horse-food, at much the same prices now obtainable for boiling. The great scarcity of maples has raised their value to 47s. per qr., duns and boilers being about 40s. per qr. The imports into London, for four weeks, have been 1,873 qrs. in all sorts of English, and 584 qrs. foreign, chiefly white. In February last year they were 1,730 qrs. of home growth, and 204 qrs. from abroad. The imports for January into the United Kingdom were 6,882 qrs., more than half from Canada, against 1,769 qrs. in Jan., 1858.

Linseed throughout the month has supported its price, or rather gained about 1s. 6d. in value per qr., notwithstanding that crushers complain that they crush without profit from the low prices realized for oil. Cakes have sold well, at full prices: and there has been a continued export demand for Linseed, as well as a good inquiry for feeding.

The seed trade has about reached its zenith, those who commenced as timid buyers of cloverseed finding out our surmises correct about the crops in this country as well as abroad, especially in the South of France. Red cloverseed has risen most probably to its full height, as farmers are reluctant purchasers at present rates, with low prices for all their produce. 90s. has been made of fine English red, and still more of fine white seed. Trefoil has not been excited, the demand not being very active. Tares have also proved a very deficient crop; and though the high prices paid have somewhat checked the demand, 10s. per bush. has been paid for fine small foreign. Canaryseed has ruled dull, at moderate rates. Hempseed, rape-seed, and the sorts used in confectionary, have been selling steadily, at former prices.

CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter	
WHEAT, Essex and Kent, white.....	39	to 48
red	36	45
Norfolk, Linc., and Yorks., red	39	44
BARLEY, malting	—	to 33
Chevalier	35	42
Grinding	24	26
Distilling	28	29
MALT, Essex, Norfolk, and Suffolk	52	to 60
Kingston, Ware, and town made ..	60	66
Brown	50	52
RYE	30	32
new	30	32
OATS, English, feed.....	19	24
Potato.....	26	50
Scotch, feed	20	24
Irish, feed, white	20	23
fine	24	29
Ditto, black	19	22
BEANS, Mazagan	37	39
Ticks	37	38
Harrow	39	41
Pigeon.....	41	44
PEAS, new, white, boilers 40	40	46
Maple 42	46	48
Grey 38	38	39
FLOUR, per sack of 280lbs., Town, Households 34s., fine 35 40	35	40
Country.....	27	29
Households.....	30	34
Norfolk and Suffolk, ex-ship	26	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. 8, 1859	40	6	32	2	21	5	30	5	39	9	41	3
Jan. 15, 1859	41	3	32	7	21	4	27	6	39	2	41	8
Jan. 22, 1859	41	9	33	2	21	8	30	10	39	4	42	6
Jan. 29, 1859	41	7	33	5	21	10	32	6	40	8	41	11
Feb. 5, 1859	40	10	33	9	21	9	33	6	40	5	40	11
Feb. 12, 1859	40	11	33	6	22	4	31	2	41	2	41	5
Aggregate average	41	2	33	2	21	9	31	0	40	1	41	7
Same time last year	47	7	36	10	22	8	32	8	39	3	40	4

PRICES OF SEEDS.

BRITISH SEEDS.

TRIFOIL, new	19s. to 22s.
TARES, Winter, new, per bushel	—s. to —s.
MUSTARDSEED, per bush., now 12s. to 16s., brown	10s. to 12s.
CORIANDER, per cwt	14s. to 16s.
CANARY, per qr.	64s. to 68s.
LINSEED, per qr., sowing —s. to 64s., crushing	54s. to 58s.
LINSEED CAKES, per ton	£9 10s. to £10 10s.
RAPESEED, per qr.	68s. to 72s.
RAPE CAKE, per ton	£5 10s. to £6 0s.
FOREIGN SEEDS, &c.	
CLOVERSEED, red 60s. to 68s.	white 74s. to 90s.
TRIFOIL	18s. to 21s.
HEMPSEED, small, 33s. per qr.	Dutch —s. to 38s.
CORIANDER, per cwt.	16s. to 18s.
CARRAWAY	42s. to —s.
LINSEED, per qr., Baltic 52s. to 56s.	Bombay 58s. to 50s.
LINSEED CAKE, per ton	£9 10s. to £11 0s.
RAPESEED, Dutch	62s. to 66s.
RAPE CAKE, per ton	£5 0s. to £6 0s.

HOP MARKET.

BOROUGH, MONDAY, Feb. 21.—There is no alteration in our market, which remains firm at the following quotations:—

Mid and East Kents	70s. to 84s.	choice	120s.
Weald of Kents	54s.	65s.	70s.
Sussex	54s.	60s.	66s.

POTATO MARKETS.

SOUTHWARK WATERSIDE, MONDAY, Feb. 21.

Since our last report, our supplies coastwise have been heavy, but from foreign ports moderate. The trade has been inactive, and prices in general rather lower than during the previous week. The following are this day's quotations:

York Regents	per ton	80s. to 100s.
Flukes		100s. to 110s.
Lincolnshire Regents		70s. to 90s.
Dunbar do		80s. to 95s.
Ditto Reds		60s. to 70s.
Perth, Forfar, & Fifeshire Regents		60s. to 70s.
Ditto Reds		45s. to 55s.
Ditto Rocks		50s. to 60s.
Foreign Whites		45s. to 65s.

BOROUGH AND SPITALFIELDS, MONDAY, Feb. 21.

—Since Monday last the receipts of potatoes, coastwise and by railway, have been moderate. The imports have amounted to 150 tons from Dunkirk, 94 tons from Rouen, 5 sacks from Boulogne, and 44 tons from Harlingen. For most kinds the demand rules steady, and prices are supported.

York Regents	80s. to 105s.	per ton.
Lincolns	75s. to 90s.	"
Essex and Kent	70s. to 90s.	"
Scotch	45s. to 95s.	"
Foreign whites	40s. to 55s.	"

COUNTRY POTATO MARKETS.—YORK, Feb. 12: Potatoes sell at 6d. per peck, and 1s. 8d. to 1s. 10d. per bushel. LEEDS, Feb. 15: We had a good show of potatoes, which sold at 7½d. to 8d. wholesale, and 9d. retail, per 21lbs. SHEFFIELD, Feb. 15: Potatoes sell at 6s. 6d. to 9s. per load of 18 stone. RICHMOND, Feb. 12: Potatoes 2s. 8d. per bushel. MANCHESTER, Feb. 15: Potatoes 6s. to 9s. 6d. per 252lbs.

ENGLISH BUTTER MARKET.

LONDON, MONDAY, Feb. 21.—Since our last we have little alteration to note. The stock of old is working up close, at irregular prices. We are getting a small supply of new, the price of which is hardly settled. Old Butter 96s. to 100s., new 134s. to 136s. per cwt.

BELFAST, (Thursdaylast).—Butter: Shipping price, 105s. to 112s. per cwt.; firkins and crocks 11½d. to 12d. per lb. Bacon, 50s. to 54s.; Hams, prime 72s. to 80s., second quality 60s. to 66s. per cwt. Prime mess Pork, 78s. to 80s. per burl; Beef 120s. to 130s. per tierce; Irish Lard, in bladders, 66s. to 70s.; kegs or firkins, 60s. to 64s. per cwt. Fork 45s. to 49s. per 120 lbs.

GLASGOW.—A good supply came forward to the weigh-house, where there were 20 tons passed the scales. Only one cart was shown in the bazaar. Prices rather better. Prime early-made 56s., late-made 44s. to 49s., skim 26s. to 28s. per cwt.

BRITISH WOOL MARKET.

LONDON, MONDAY, Feb. 21.—Since our last report, the transactions in all kinds of English wool have been rather limited, owing to the near approach of the public sales of Colonial. In prices, however, we have no change to notice. The supply of Wool on offer is limited; and the inquiry for export purposes is very limited.

Per pack of 240lbs.

Fleeces—Southdown Hogs	£18 10s to £19 0
Do. Half-bred Hogs	18 10 19 0
Do. Kent	17 10 18 0
Do. Southdown Ewes and Wethers	16 10 17 0
Do. Leicester do.	16 10 17 10
Sorts—Clothing, picklock	18 10 19 0
Do. Prime and picklock	17 10 18 0
Do. Choice	16 0 17 0
Do. Super	14 0 15 0
Do. Combing—Wether matching	19 10 20 0
Do. Picklock	16 10 17 10
Do. Common	11 0 15 0
Do. Hog matching	22 10 23 10
Do. Picklock matching	17 0 18 0
Do. Super do.	14 10 15 10

LIVERPOOL WOOL MARKET, FEB. 19.

English combing wools have met with rather more inquiry, which has partially arrested the decline, which may be quoted 0½d. per lb. from the highest point; and if confidence was restored there would be an immediate reaction, stocks being very low.

	s.	d.	s.	d.
Laid Highland Wool per 241bs	11	3	10	6
White Highland do.	14	0	16	6
Laid Crossed do. unwashed	14	6	16	6
Do. do. washed	15	0	16	6
Laid Cheviot do. unwashed	15	6	17	6
Do. do. washed	18	6	22	6
White Cheviot do. washed	32	6	40	0

FOREIGN.—Some considerable sales have been made, which are supposed to be intended for export, and the supply of all kinds is very limited.

MANURES.

PRICES CURRENT OF GUANO, &c.

PERUVIAN GUANO, (per ton, for 30 tons)	£12 5 0 to £0 0 0
Do. Do. (under 30 tons)	13 6 0 0 0 0
BOLIVIAN GUANO	none 0 0 0 0 0 0

ARTIFICIAL MANURES, &c.

Nitrate Soda (per ton)	£16 15 0 to £17 10 0	Sulph. of Copper	£ s. d.	s. d.
Nitrate Potash or Saltpetre	29 0 0 30 0 0	or Roman Vitriol, for Wheat steep, 1st qual.	37 0 0	39 0 0
Sulph. Ammonia	14 10 0 15 0 0	Ditto, 2nd quality	24 0 0	28 0 0
Muriate ditto.	23 0 0 26 0 0	Salt	1 0 0	1 5 0
Superphosphate	5 10 0 6 0 0	Bones, Dust, per qr.	1 0 0	1 1 0
Soda Ash, or		Do. Vitriol, concentrated	0 19 0	1 0 0
Alkali, or	11 0 0 12 0 0	per lb.	0 0 1	0 0 0
Gypsum	1 10 0 2 0 0	Do. Brown	0 0 2	0 0 0
Coprolite	2 10 0 3 0 0			

OIL-CAKES.

Linsed-cakes, per ton—		Marseilles	£9 10 0 to £10 0 0
Thick do. round (noise)	10 0 0 10 10 0	English	10 10 0 0 0
	0 0 0	Rape-cakes, per ton	6 0 0 6 10 0
		Cottonseed cakes	5 10 0 8 0 0

JOHN KEEN, 35, Leadenhall-street.

(Late Adams, Pickford, and Keen.)

Agri-cultural Chemical Works, Stowmarket, Suffolk.	
Prestie's Cereal Manure for Corn Crops	per ton £8 10 0
Prestie's Turnip Manure	7 0 0
Prestie's Superphosphate of Lime	6 10 0

Manufactured by Hodgson & Simpson, Wakefield, and Matthews & Co., Driffield.	
Nitro-Phosphate	per ton £7 10 0
Ammonia-Phosphate	8 0 0

Vitriol, Bone, and Manure Works, Howden Dyke, Howden.	
Ammonia Phosphate	per ton £10 0 0
Anderton's Turnip Manure	8 0 0
Super-Phosphate of Lime	7 0 0

IMPORTANT TO FLOCKMASTERS.

THOMAS BIGG,

AGRICULTURAL AND VETERINARY CHEMIST,

BY APPOINTMENT, TO H. R. H. THE PRINCE CONSORT, K. G., &c.

LEICESTER HOUSE, GREAT DOVER-STREET BOROUGH, LONDON,

Begs to call the attention of Farmers and Graziers to his valuable SHEEP- and LAMB DIPPING COMPOSITION, which requires no Boiling, and may be used with Warm or Cold Water, for effectually destroying the Tick Lice, and all other insects injurious to the Flock, preventing the alarming attacks of Fly and Shab, and cleansing and purifying the Skin, thereby greatly improving the Wool, both in quantity and quality, and highly contributing to the general health of the animal.

Prepared only by Thomas Bigg, Chemist, &c., at his Manufactory as above, and sold as follows, although any other quantity may be had, if required:—

4 lb. for 20 sheep, price, jar included	£0	2	0	
6 lb. " " " "	.....	0	3	0
8 lb. " " " "	.....	0	4	0
10 lb. " " " "	.....	0	5	0
20 lb. " " " "	(cask and measure	0	10	0
30 lb. " " " "	included)	0	15	0
40 lb. " " " "	.....	1	0	0
50 lb. " " " "	.....	1	3	6
60 lb. " " " "	.....	1	7	6
80 lb. " " " "	.....	1	17	6
100 lb. " " " "	.....	2	5	0

Should any Flockmaster prefer boiling the Composition, it will be equally effective.

He would also especially call attention to his SPECIFIC, or LOTION, for the SCAB, or SHAB, which will be found a certain remedy for eradicating that loathsome and ruinous disorder in Sheep, and which may be safely used in all climates, and at all seasons of the year, and to all descriptions of sheep, even ewes in lamb. Price 5s. per gallon—sufficient on an average for thirty Sheep (according to the virulence of the disease); also in wine quart bottles, 1s. 3d. each.

IMPORTANT TESTIMONIAL.

"Scoulton, near Hingham, Norfolk, April 16th, 1855.

"Dear Sir,—In answer to yours of the 4th inst, which would have been replied to before this had I been at home, I have much pleasure in bearing testimony to the efficacy of your in-

valuable 'Specific for the cure of Scab in Sheep.' The 600 Sheep were all dressed in August last with 84 gallons of the 'Non-Poisonous Specific,' that was so highly recommended at the Lincoln Show, and by their own dresser, the best attention being paid to the flock by my shepherd after dressing according to instructions left; but notwithstanding the Scab continues getting worse. In December I informed the 'Agent for the above Specific,' that the flock was not cured, and that it requires their immediate attention. The Agent informed me they should be at once seen to, but did not do so until five weeks afterwards, and in the mean time the Scab spread over the whole flock, that I never saw such a disgraceful sight in my life; and when the Dresser was sent over to inspect the Flock, he decided on not dressing them again, as one-third of the Sheep had lost half their wool. I then agreed with an experienced dresser in Norfolk to dress the flock, and when he saw the sheep he declined doing them, as they were so very bad, and the time of lambing so near. Being determined to have the Scab cured if possible, I wrote to you for a supply of your Specific, which I received the following day; and although the weather was most severe in February during the dressing, your Specific proved itself an invaluable remedy, for in three weeks the Sheep were quite cured; and I am happy to say the young lambs are doing remarkably well at present. In conclusion, I believe it to be the safest and best remedy now in use.

"I remain, dear Sir, your obedient servant,

"For JOHN TINGEY, Esq.,

"R. RENNY.

"To Mr. Thomas Bigg."

In addition to the foregoing, he has very materially improved, as well as considerably reduced the price of his Dipping Apparatus; and he would venture to suggest that no Flockmasters ought now to be without one.

Price in London, New and Improved Dipping Apparatus, on Wheels £14 0 0

Ditto ditto with Iron-bar Drainer 5 0 0

Ditto ditto 4 0 0

Ditto, plain, with Wooden Drainer 3 0 0

N.B.—Catalogues, containing List of Patrons, Testimonials, &c., to be had of all agents, or sent direct per post free.

CURTIS ON MANHOOD.—SHILLING EDITION.

A MEDICAL ESSAY ON NERVOUS AND GENERATIVE DISEASES.

Just Published, the New Edition, 120th Thousand, with numerous Plates, in a sealed envelope, price 1s., or sent, post-paid, by the Author, for 14 stamps.

MANHOOD: the CAUSE and CURE of PREMATURE DECLINE, with plain directions for perfect restoration to health and vigour; being a Medical Review of the various forms and modern treatment of Nervous Debility, Impotency, Loss of Mental and Physical Capacity, whether resulting from youthful abuse, the follies of maturity, the effects of climate, or infection; with Observations on a new and successful mode of detecting Spermatorrhœa, and other Urethral Discharges, by Microscopic Examination; to which are added, curious and interesting cases, with the Author's recipe of a Preventive Lotion.

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"CURTIS ON MANHOOD.—The book under review is one calculated to warn and instruct the erring without imparting one idea that can vitiate the mind not already tutored by the vices of which it treats."—*Naval and Military Gazette*, Feb. 1, 1851.

"We feel no hesitation in saying, that there is no member of society by whom the book will not be found useful—whether such person hold the relation of a parent, preceptor, or a clergyman."—*Sun*, Evening Paper.

Published by the Author: sold also in sealed envelopes by Gilbert, 49, Paternoster-row; Hannay, 63, Oxford-street; Mann, 39, Cornhill, London; "Herald" Office, Taunton; Lockyer, Lincoln; Heywood, Oldham-street, Manchester; Howell, 6, Church-street, Liverpool; Ashley, Post-office, Newbury; Ferris and Score, Union-street, Bristol; Pierson, Shrewsbury; Jull, Braintree; Thew, Lynn; Peat, Chichester; Lurcock, Maidstone; Cook, Ipswich; Huscroft, Bury St. Edmunds; Dove, Swindon; Jarey, Bridewell Alley, Norwich; Smith, Rose Crescent, Cambridge; Slatter, Oxford; and by all Booksellers and Chemists in the United Kingdom.

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are universally held in high estimation; and the fact of the distinguished Patronage they enjoy, their general use in all countries, and the numerous testimonials constantly received of their efficacy, sufficiently prove the value of their "**MACASSAR OIL**," "**KALYDOR**," and "**ODONTO**."

THE FIRST PRODUCTION IN THE WORLD

For the **GROWTH** and **IMPROVEMENT** of the **HUMAN HAIR**, is

ROWLANDS' MACASSAR OIL

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It prevents Hair from falling off or turning grey, strengthens weak HAIR, cleanses it from Scurf and Dandriff, and makes it **BEAUTIFULLY SOFT, PLIABLE, and GLOSSY**. In the growth of

THE BEARD, WHISKERS, AND MUSTACHIOS

it is unfailing in its stimulative operation. For **CHILDREN** it is especially recommended as forming the basis of a **BEAUTIFUL HEAD OF HAIR**. Its invaluable properties have obtained the Patronage of **ROYALTY**, the **NOBILITY**, and the **ARISTOCRACY** throughout Europe; while its introduction into the Nursery of **ROYALTY**, and the high esteem in which it is universally held, with numerous Testimonials constantly received of its efficacy, afford the best and surest proofs of its merits.—Price 3s. 6d. and 7s.; Family Bottles (equal to four small), 10s. 6d.; and double that size, 21s.

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Are realized by the use of

ROWLANDS' KALYDOR,

This Royally-patronized and universally esteemed Specific exerts the most soothing cooling, and purifying action on the Skin eradicates *Freckles, Tans, Pimples, Spots, Discoloration* and other *Cutaneous Visitations*, and renders

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Are indispensable to **PERSONAL ATTRACTION**, and to health and longevity by the proper mastication of food.

ROWLANDS' ODONTO,

OR, PEARL DENTIFRICE,

Compounded of **ORIENTAL INGREDIENTS**, is of inestimable value in

**IMPROVING AND BEAUTIFYING THE TEETH,
STRENGTHENING THE GUMS,**

And in rendering

THE BREATH SWEET AND PURE.

It eradicates Tartar from the Teeth, removes spots of incipient decay, and polishes and preserves the enamel, to which it imparts a

PEARL-LIKE WHITENESS.

As the most efficient and fragrant aromatic purifier of the Breath, Teeth, and Gums ever known, **ROWLANDS' ODONTO** has, for a long series of years, occupied a distinguished place at the Toilets of the Sovereigns and the Nobility throughout Europe; while the general demand for it at once announces the favour in which it is universally held.—Price 2s. 9d. per box.

CAUTION.—The words "**ROWLANDS' ODONTO**," are on the Label, and "**A. ROWLAND & SONS**," 20, Hatton Garden, engraved on the Government Stamp affixed on each box.

Sold by the Proprietors and by Chemists and Perfumers.

**** BEWARE OF SPURIOUS IMITATIONS !!**

No. 4, Vol. XV.]

APRIL, 1859.

[THIRD SERIES.

THE
FARMER'S MAGAZINE,
AND
MONTHLY JOURNAL
OF
THE AGRICULTURAL INTEREST.

Dedicated

TO THE
FARMERS OF THE UNITED KINGDOM.

LONDON :
PUBLISHED BY ROGERSON AND TUXFORD, 246, STRAND.

PRICE TWO SHILLINGS.

DR. HASSALL
ON
THORLEY'S FOOD FOR CATTLE.
FROM THE "MARK LANE EXPRESS," 10th JAN., 1859.

74, WIMPOLE STREET, CAVENDISH SQUARE, 21st December, 1858.

HAVING, on more than one occasion, been requested to make an analysis of THORLEY'S WELL-KNOWN FOOD FOR CATTLE, and to express my opinion respecting it, I placed myself a short time since in communication with Mr. Thorley, desiring to be furnished with certain particulars relating to his Food. Mr. Thorley, who was previously a stranger to me, at once conducted me over his Manufactory, showed me all the ingredients employed, and also the process of manufacture of the article.

I took away with me samples of the food as well as of every ingredient entering into its composition. I have since carefully examined and tested these, and I have also compared the samples procured at the Manufactory with others obtained by myself from other sources.

I am, therefore, now in a position to express an authoritative opinion respecting the composition and properties of THORLEY'S FOOD FOR CATTLE. I would remark of it—

First. That the ingredients used are all of excellent quality, and are purchased without regard to expense.

Second. That the receipt or formula, according to which the Food is prepared, is an admirable one, no ingredient being selected on account of its cheapness, but those only being chosen which are best adapted to fulfil the objects intended.

Having regard, thus, to the composition of THORLEY'S FOOD FOR CATTLE, I find that it possesses the following properties in an eminent degree—it is highly nutritious and fattening—it is a tonic and gentle stimulant, aiding, when mixed with other descriptions of food, materially the digestive powers of an animal—a point of great consequence, since it is an undoubted fact that much of the nourishment contained in the ordinary food given to cattle is lost in consequence of the impaired or defective action of the digestive organs.

Comparing THORLEY'S FOOD FOR CATTLE with other Cattle Foods, with the composition of which I am acquainted, I unhesitatingly assert that it is infinitely superior to any others, at present known to me. In all those of the composition of which I have a knowledge, I have found ingredients to be present which have been added solely on account of their cheapness, that is for the purpose of adulteration, and to the exclusion of other more valuable, but more expensive, articles. In some of the Foods I have detected ingredients which are positively hurtful.

Comparing, also, the samples taken by me from the Manufactory with others procured different sources, I found a perfect accordance in the composition of both series of samples.

Before bringing this Report to a conclusion, I would notice an objection sometimes urged against the use of Cattle Foods generally, namely, that the price at which they are sold exceeds considerably that of the materials from which they are prepared; this can be readily shown to be a very unreasonable objection. THORLEY'S FOOD FOR CATTLE is a compounded and manufactured article, upon the composition and preparation of which much care, labour, and expense have been and are bestowed. Moreover, the refuse materials resulting from the cleansing, grinding, &c., and which are an entire loss, amount to twenty per cent. To estimate, therefore, the value of such an article merely at the cost of the raw materials is both absurd and unjust.

Neither must the value of this, or any other Cattle Food, be determined by the exact amount of nourishment contained in them; although in the case of THORLEY'S FOOD this is very considerable, but the indirect effects resulting from its employment must be taken into consideration; that is, the effects of the article in improving the appetite, digestive powers, and general vigour of the Cattle fed upon it. By the improved condition of the digestive organs animals may be fed upon coarser and cheaper articles of food, and from which, without the aid of THORLEY'S FOOD, they would be unable to extract all the nourishment which such articles actually contain. I consider, then, that the use of THORLEY'S FOOD is attended, not with an additional, but with a considerable saving of expense.

I am glad, therefore, to be enabled to recommend—which I do strongly and conscientiously—THORLEY'S FOOD FOR CATTLE as a highly important and valuable compound for the feeding of all descriptions of Cattle.

ARTHUR HILL HASSALL, M.D.,
Signed, *Analyst of the Lancet Sanitary Commission; Author of the Reports of that Commission; of "Food and its Adulteration;" "Adulterations Detected;" &c., &c.*

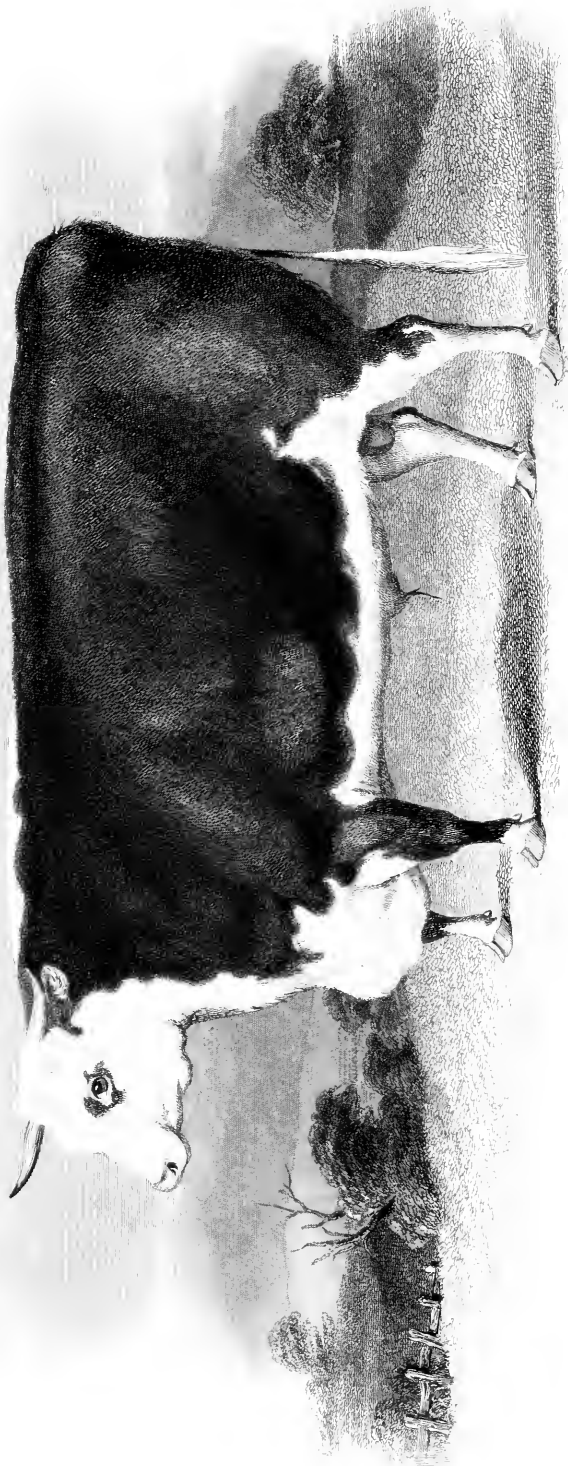
From Alfred Brown, Esq., Wandsworth, Surrey, Member of the Royal College of Surgeons, England; Licentiate of the Apothecaries' Company, London; Fellow of the Medical Society of London; late Demonstrator of Anatomy at the St. George's School of Medicine.

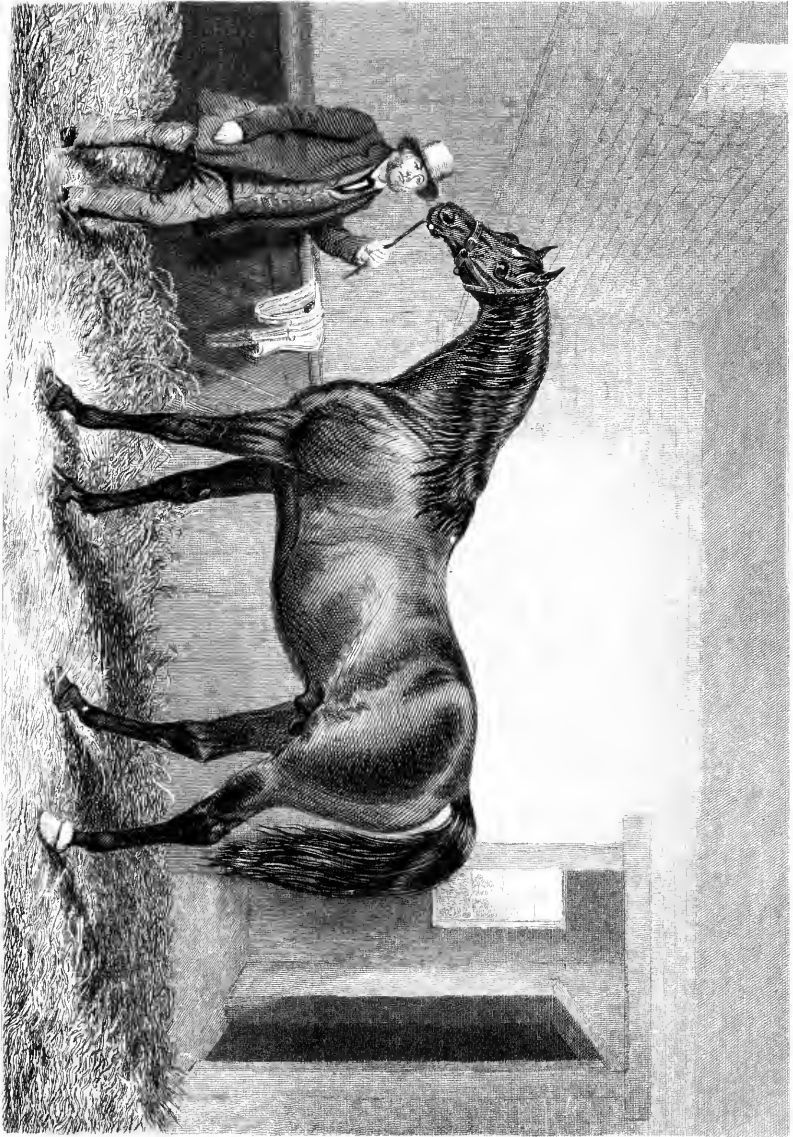
Wandsworth, Surrey, Dec. 11, 1858.

Sir,—I shall feel obliged by your sending me another cask of Thorley's Cattle Food. I have been making experiments with it upon one of my milch cows, and think it only fair that I should let you know the results. My cow, before I used the Food, was fed upon hay, wortzel, and water *ad libitum*, and upon this diet she yielded one gallon of milk per day, making two pounds of butter per week. She was five months gone with her second calf; when she had the Food I discontinued giving her the wortzel, and gave her a measure-full (about half-a-pint) of the Food with a peck of damp chaff night and morning; besides, she had as much good hay as she would eat. Upon this diet, in less than a week she doubled the quantity of milk and butter; and in order that I might be sure that this excellent result depended upon the Thorley's Food, I discontinued it, and returned to her former diet, and she speedily went back to the gallon of milk per day. After waiting about a fortnight, I again returned to the Thorley's Food, and in a few days she increased to two gallons of milk per day. This experiment I repeated several times, and with the same results. I have tried the Food upon other animals—horses, sheep, &c.—and with the most satisfactory results. I have also analysed the Food, and find that it contains nothing that would in any way injure the system or constitution of cattle. You are at liberty to make any use you please of this communication, and I am, Sir, yours, &c.,

ALFRED BROWN.

To Mr. J. Thorley.





THE FARMER'S MAGAZINE.

APRIL, 1859.

PLATE I.

CLARET; A HEREFORD BULL,

THE PROPERTY OF MR. RICHARD HILL, OF GOLDING HALL, SHREWSBURY.

PLATE II.

COTHERSTONE; A THOROUGH-BRED STALLION,

THE PROPERTY OF THE RIGHT HONOURABLE EARL SPENCER.

CLARET; A HEREFORD BULL,

THE PROPERTY OF MR. RICHARD HILL, OF GOLDING HALL, SHREWSBURY.

Claret, bred by Mr. Hill, is of the purest Knight blood, and a Hereford of the very highest descent. He was calved on August 24th, 1856, and is by the Knight (185), dam Primrose, by Sibdon (1385).

In 1858, at the Chester meeting of the Royal Agricultural Society of England, Claret took the first prize of £25, as the best two-year-old bull.

At the Hereford county Meeting, in the autumn of the same year, he took the first prize of his class.

And at Bridgnorth, he again took the first prize for young bulls.

Claret is a remarkably handsome specimen of the Hereford, while he unites good looks with a capital hardy constitution, and a most excellent quality. He is rather a dark-coloured bull, but both his sire and dam were of the orthodox light-red.

We had to record the show of Herefords at Chester as a very admirable one, and that last held in the native county was thought never to have been equalled. At both these it will

be observed Claret distinguished himself, while the family have long been well-known in the strongholds of the white-faces. In 1855, Restorative, a half-brother to Claret, in addition to several other local premiums, carried off the Great All England Sweepstakes at Ludlow, for the best bull of any breed. Candidate, another half-brother, was a winner at Salisbury.

Mr. Robert Smith, in his "Journal Report," thus writes of the rise and value of the Herefords:

"This race of cattle, which has long been distinguished for its splendid oxen, was shown in greater numbers at Chester than at any previous meeting of the Society, with the exception of Shrewsbury, and formed one of the most attractive classes. Their placid and beautiful countenances—denoting that general mildness of temper so necessary for the success of the grazier—together with their substance of flesh in proportion to bone, could not fail to strike all who beheld them. The Herefords clearly come under the same

denomination as the Devons, viz., the 'middle-horn' tribe of cattle: they are considered to be an aboriginal breed, and descended from the same stock as the Devons. Little is known respecting their origin, further than that for many generations they can be traced as the peculiar breed of the county from whence they take their name. Yet a few years since they were not of the same uniform appearance of colour as now, there having been some herds self-coloured like the Devon and Sussex breeds, and opinions have been published that this was their original character. Subsequently we find the grey, the mottled, and the white-faced, each with their distinct admirers and their successful breeders. This sub-division of a race of animals (it may be readily imagined) would occur from the use of a self-coloured bull with a white-faced cow, or the reverse; but that the race was originally red with a white face, is clearly indicated by the almost perfect uniformity of colour which the breed of the county now presents. The Hereford cattle have hitherto been held in high estimation for the rapidity with which they feed and the quality of their flesh, together with the working powers of the oxen, which display the activity of the Devon combined with the strength of the Durham.

"The calves usually run with their dams in a natural state—a rude state of things which the breeders ought to alter, as its present effect is to depreciate the value of the whole race. In this thickly populated kingdom it is necessary that

both milk and flesh be produced. We hope to be excused for making this allusion, particularly as we are aware that not only can these cattle be greatly improved by cultivation, but that their milk is of a superior quality, and yields a return equal to that of any other breed possessing similar pretensions to flesh.

"Among the earliest breeders of celebrity, of whom anything is known, the names of Tully, Yeoman, Skyrene, Williams, and Weyman, may be mentioned as some of the most successful. Subsequently those of Tomkins, Price, Hayton, Jones, Hewer, Jeffries, Knight, and Smithies. These, too, have passed away; and in our present day we see recorded in the Society's Journals an increasing number of competitors from different parts of the kingdom. This proves that the value of the breed is becoming more appreciated. A few years since they were almost exclusively in the hands of the tenant farmers of their native county; they now form the principal breed of the counties of Monmouth, Radnor, Brecon, Salop, and parts of the counties of Gloucester, Worcester, Warwick, Stafford, Wilts, Herts, Dorset, Somerset, and Cornwall. There are also some good herds in North Wales and Scotland, for which districts their hardiness of constitution, thick but mellow hides, wavy, soft, and moderately long hair, render them peculiarly adapted. Recently a considerable number have been exported to America and the Australian colonies, where they are rapidly gaining favour."

COTHERSTONE; A THOROUGH-BRED STALLION,

THE PROPERTY OF THE RIGHT HONOURABLE EARL SPENCER.

Cotherstone, bred by Mr. Bowes in 1840, is by Touchstone out of Emma, by Whisker, her dam Gibside Fairy by Hermes—Vicissitude by Pipator—Beatrice by Sir Peter.

Touchstone, by Camel out of Banter by Master Henry, has long been famous as the most successful stallion of the day. His box at Eaton was one of the local attractions of the recent Agricultural Meeting at Chester, where the old horse was to be seen still fresh and well.

Emma, foaled in 1824, has been almost equally renowned in the stud. She was the dam of Mundig and Cotherstone, two Derby winners, as well as of Trustee, Mickle Fell, Trustee, Black Beck, and others. Emma died in the autumn of 1852.

Cotherstone was a magnificent horse when in work; in fact, we never saw a Derby winner show more power and substance. He left the Turf in his fourth year, and was at once purchased by the

late Lord Spencer, and taken to Althorp, where he has since continued. His stock first came out in 1848, and he is the sire of some very good winners. His portrait, however, is more especially presentable here as being the sire of the best thorough-bred hunting stallion entered at the last meeting of the Royal Agricultural Society. Curiously enough, the Chester Show added yet further to Touchstone's honours, as the stallion the judges selected was Spencer by Cotherstone, and Cotherstone by Touchstone. The prize horse, although a very neat one, has by no means the size or substance of either his sire or grandsire. It would have been a great thing to have had either of them on the Roodee at such a time.

Cotherstone's companion in the print is Mr. Wilson, the stud groom at Althorp. We refer the reader for any further particulars to our List of Stallions for the season in the present number.

THE HERDS OF GREAT BRITAIN.

CHAPTER III.

THE BUSHEY HERD.

The North-Western traveller, who may have a glance to spare from his newspaper or his book, cannot have failed to observe a low square range of farm buildings, grouped near some haystacks on a "gentle eminence," near Watford, while the white chimneys of the Squire's peep coyly out from behind a clump, in an undulating lawn to the left. If the "Herd Book" is a name unknown to him, he passes it by as a comfortable English homestead, to which he may expect to find a dozen winsome marrows on his route North; but if, on the contrary, he has ever dived into that vast hereditary Peerage of Hoof and Horn, with its "Queens," its "Blossoms," its "Duchesses," and its "Butterflies," it suggests to him many a pleasant recollection of Marmaduke, and the slashing biddings for Great Mogul.

The view from the hill on the foreground, where Mr. Wetherell's glass fell at last to so brilliant an average on that

"Merrie afternoon in May,"

is very comprehensive. The visitor who longs to combine pedigrees with the picturesque, must stroll as far as Bushey Heath, if he would catch a glimpse of the once-mitred Abbey of St. Alban's, and the Keep of Windsor; but here Moor Park, Cassiobury, The Grove, and Hazlewood, all contribute their quota to the richly-wooded panorama on the West; while Scots Wood, High Wood, and Bury Grove afford snug lying to the foxes of Lord Dacre's hunt, and shelter to the shorthorns against the "angry East." The Bushey Grove property, which is somewhat intersected by lanes, consists of a farm of 400 acres, of which from 170 to 200 are mown every year. Its soil, which rests on a chalk substratum, is of rather thin staple, and very productive of blue pebbles and flints, which are nevertheless turned to ample account, as paving for the raised causeways in the cattle yards; but it renders a much more sterling account of itself in the three hundred tons of mangold-wurtzels, stacked in long array near the straw-yard, and which were just being brought into use, for the first time on the day of our visit.

It is about sixteen years since Mr. Stewart Marjoribanks commenced breeding Shorthorns. Disregarding pedigrees, and trusting to care and high-feeding, he at first bought a promiscuous lot of cows at a moderate price, and crossed them with the bull Mambrino (7196), who was bred by John, Earl of Spencer. This herd was sold off in the June of 1850, at the low average of £29 14s. for 59 head. The foundation for a second herd was immediately laid. Several cows and heifers of roundabout blood, it is true, were included among the new purchases; but still the germ of better things was to be found in Renet and Dowager Queen (which had

many crosses of Booth's best blood), Mary of the Gwynne tribe, and some few by Bates's Cleveland Lad 2nd. They were crossed with Lord Foppington (10437) bred by Mr. Fawkes; but the new blood had not sufficient time to develop itself in three years, and in May, 1853, the 66 head only averaged £33. Lord Foppington and Sir Ronald, and several cows and heifers were purchased by Mr. Wilson for his Royal Highness the Prince Consort, who was then just beginning to form a herd; and the selection of their Bushey Grove successors was placed in the hands of Mr. Tallant, who had become Mr. Marjoribanks' bailiff on the October previous.

This time, no pains or money were spared to procure first-class stock. Herds were inspected, from Cobham to "Cannie Aberdeen." The agents of Col. Towneley and Mr. Marjoribanks were found competing for a Jeweller heifer to the tune of two hundred at Mr. Grundy's; and Mr. Cruickshank, like another Lord Ullin, was "left lamenting" (with a pocket full of guineas) that his herd had been rifled of its fairest daughter, Khirkee the First. King Arthur was hired as a cross from Mr. John Booth; while Marmaduke, a combination of The Duchess and Princess blood, was bought at the Hendon sale, when only seven weeks old, for 100 gs., and a 300-guinea cheque was borne back by Mr. Culshaw to Towneley Park from the Chelmsford Royal Show, in lieu of Master Butterfly 2nd. At the end, however, of four years, Mr. Marjoribanks "hedged" again, and £90 2s. 5d. was the splendid average for 59 lots. The plan is not exactly orthodox, but it had at its third test the merit of being as successful as it is dashing and novel; although, in spite of the greatest skill and care, it must place Bushey at a sad disadvantage, when the pets of the Warlaby and Townley herds, &c., have to be confronted for a battle royal. Mr. Marjoribanks, who had won many local prizes, never entered the Hanover Square lists till the summer of 1855 at Carlisle; when four yearling heifers and the yearling bull Panmure formed the lot, and although only one of them earned a commendation, the whole five found a purchaser in Comte de Seraincourt, for 100 gs. each. At Salisbury, however, in 1857, Bushey came out with Great Mogul, beating, among others, Mr. Richard Booth's Lord of the Valley in the bull-calf class, and was second to him in turn at York; while at Chester he was second as a yearling bull to Viscount Hill's Hetman, and then held his own against all comers at Northallerton. His next appearance in public is, we believe, deferred till 1860, as he has a more important mission to achieve for posterity than laying on fat and flesh for Warwick gazers.

The incidents of the last Bushey sale, and the beautiful bloom in which the lots were brought to the hammer, quite form an epoch, like Ketton, Wiseton and Kirklevington, in shorthorn lore. Great Mogul then a

seven-months' calf, was bought in, after some very rapid 50-guinea volleys, at 400 gs.; while Master Butterfly 2nd departed to Mr. Cruickshanks' Highland home for 400 gs., where he died not many weeks since from affection of the brain. The same gentleman fought it out, bidding for bidding, up to 490 gs. for Marmaduke, but did not care to go on after the decisive "five hundred guineas!" from the lips of Mr. Harvey Combe, who had no notion of seeing him go over the Border. Mr. Marjoribanks's fancy for a calf by The Duke of Glo'ster had induced that gentleman to oppose Mr. Banks Stanhope at Hendon for Marmaduke, and at this sale nearly all his cows were in calf by him. One heifer of his blood alone remains at Bushey Grove; but he has set a most unmistakable mark on the herd of his adoption, where nine-tenths of his calves have been heifers. Old Cambridge Rose, that remnant of Kirklevington, has been in the fashion, and her Moss Rose is among the sweetest-looking of the Cobham calves. Gracious out of Graceful, and Ayah out of Asia, are nearly as beautiful as they can be; and those cousins-german, Samphire out of Sea Weed, and Saucy out of Saucebox, and Looy, who reproduces her mother Leila's beautiful head, complete a half dozen which would be hard to beat in any herd. There may be a little lightness of thigh and coarseness of head and horn in Marmaduke; but his undeniable top and wondrous crops and shoulders atone for all; and his rich-haired daughters will, with their sire help to shoot the average not a little on the 23rd inst.

But we must not wander in the spirit from Bushey to Cobham, closely as we once alas! were wont to connect them. The Bushey herd No. 4 is already, to judge from precedent, through quite half its allotted span, and ripening gaily for dispersion. Since the last sale there have been considerable alterations in the farm buildings. The last chimney of the old farm house has bowed its head to the ropes, and fell as we were viewing Crutchey, by Booth's Prince George, out of Pisk by Tinsley, in the scrupulously neat straw-yard, and thinking from her nice snug make that she could not fail to be a bull breeder; while divers old cow-houses and pigstyes have alike yielded to fate and the stonemason. There are now upwards of 60 loose boxes on the premises, with some fifty head of cattle in them, not including the dozen polled Galloways, who act as scavengers among the rough grass, and are tied up the week before Christmas in beds of chaff and cavings. The cows were wont to be tied up before, but now they are housed in boxes thirteen feet by nine, while those for the young stock are rather smaller. The zinc troughs at the head of each manger run the whole length of the buildings, and are supplied by a pump; spar compartments of about four and a-half feet between them help the ventilation, and the name of each animal is nattily painted above it.

Entering at one corner we first came *vis à vis* with White Rose, a cow of fine substance and especial loins and ribs, by Whittington (12229), out of Windsor Flower, by Earl of Scarboro', the Windsor winner. She was bought as a heifer from Mr. Wetherell, and won some prizes in that eminent breeder's hands. Pepita

a roan and a very good milker, but with the bloom rather off her, from recent calving, represents the Bates's Refiner blood. She was bought by Mr. Strafford with Camelia (who has since been sold to the Emperor of the French), at Mr. Chrisp's sale, where they ranked among the best. Mr. Lax's Ravensworth tribe is represented in Myrtle by The Vicar (15408), out of Rosa, who unites with fine quality of flesh and substance a somewhat old-fashioned head. Her neighbour, Annie, is by Captain Shafto, the prize bull at the Northampton Royal; and her compact little form, snug shoulders, and well-sprung ribs, have been well reproduced in her clever bull-calf, Baron of Bushey, by Booth's Bridesman. Master Butterfly has a worthy representative in Red Butterfly, out of Vestris 2nd, who was bought from Colonel Towneley for the same sum that Mr. Cruickshanks gave for her brother at the sale; but she is not three years old, and is not likely to enter a show-yard yet. Ruby 4th, by Horatio, who came from Col. Towneley along with her, strains back to Lax's Duke, and is, save and except Lucy, the most massive cow in the yard. She was highly commended in her class at Chester; and her bull calf, Bravo, was lately parted with to Mr. Samuel Brooks, of Manchester—a new acquisition to the Short-horn owners, and already the president of a society.

Anon we came across old Kirkee, who was bred by Mr. Grant Duff, county Banff, and was one of the two cows retained at the 1857 sale. She was well bought in at 130 gs., as she has proved herself, by producing five heifers in succession in 50 months, the most profitable cow that ever came to Bushey. There are several crosses of Booth and Bates' blood in her; but her daughter Kirkee III. by Booth's King Arthur at her side does not fulfil anticipation. The Kirkee numbers are now given up; and her last calf is Queen of the South by Melbourne II., who is now among Mr. Dudley Marjoribanks's shorthorns at the Bushey Hall farm. His sire, Melbourne I., was bought as a bull calf from Mr. W. Smith, of Raseu, and died while he was being prepared for the Lincoln Royal. Queen of the South, who is possibly going to Warwick, is a wonderful grazer, and fine as a racer in the bone; and 200 gs. was offered for her in vain when four months old. The daughter of Earring, who stands next her, is by Wilkinson's Monarch, and has a heifer calf, Telltale, by Windsor Second. Monarch made her somewhat harsher in the hair than her dam, but her calf gets the quality back. Passing by Mayflower, a very nice cow of Lax's Magician tribe, we come to Coquette and Rosa Bonheur, both by Towneley's Horatio and the first purchases for the new herd. Rosa's quarters are not so good as Mayflower's; but we may seek in vain for other faults, and she has the honour of being the dam of Cock-o'-the-Walk, the first calf that was ever dropped to Great Mogul.

Passing into the other yard, we find the Spencer blood well represented in Young Daisy and Lucy Ind. The former, who has a strong touch of the old fashion about her, and a somewhat thick neck, was bought at Mr. Spearman's sale. She is by Lord Spen-

cer's Zadig, dam Wild Flower, by Bates's Duke of Richmond, who fell to Mr. Maynard's nod on the Kirklevington day. Lucy II. is by Lord Foppington, and the only cow retained with old Kirkee at the second sale. Her dam, Lucy, was by Mambrino, the first thorough-bred bull Mr. Marjoribanks ever had, and, with the exception of Lord Foppington, she is full Spencer blood. She has all the characteristics of the Wiseton herd, a slight absence of hair, and close texture of flesh, and inclined, from age, to be a little patchy, but still with fine character and a sweet head and horn. Lady Spencer, by Usurer out of Sibyl by Lord Warden, is rather leggy, and "disappoints the pedigree," which is unbroken in purity from Lord Spencer to Mason.

Two very remarkable heifers of very opposite styles stand near them, over which many a good judge has already lingered minute after minute, and hardly made up his mind then. Elegance, who was bred by Mr. William Smith, is a complete combination of Booth and Bates, as she is by Lord Raglan, a son of Harbinger, out of Variety, a daughter of Bates's Third Duke of York. She has very fine length, great in her girth, and as even as a die, with the exception of a slight fall from the hip to the rump. She has never been shown yet; but if she goes to Warwick, she will require a good deal of getting rid of, in the two-year-old class. Vesta is of Booth blood on both sides, as the first glance at her Queen of the Isles' sort of head will tell, through Royal Buck and Leonidas. She is a heifer of a richer colour and squarer build than Elegance, but not quite so much length. Her ribs and loins unite in a very remarkable degree, and the former has, if possible, more prominence than the hip. Helen by Booth's Bridesman, dam by Captain Shafto, is very good in the chine, and altogether a capital heifer, but she is unfortunately just too old to show as a yearling. Zenith by Booth's Prince George, dam Zenobia III. by "the handsome Belleville," is a high-class animal who has still to come out. Own sister to Mr. Wetherell's renowned bull Statesman is here also, in the shape of the white Silver Bell, by Earl Scarborough, a heifer with beautiful flesh and hair, but perhaps a trifle too much length. Water Witch is also from Mr. Wetherell's herd, and runs back on her dam's side into the White Rose and May Flower—a fine old tribe, of whose sound constitution Mr. Lax was so justly proud. She was the last we looked over, with the exception of Queen Bess III., who stood in the farthest corner of her house. This red heifer is all Booth, except one cross of Lawson's Wellingtoun, and her close rib and loin do the great Yorkshire herd full justice; but she is a little light of bone, and hence the judicious cross with Great Mogul seems likely to hit.

Six out of the nine young bulls are by Great Mogul, who traces his descent through thirteen crosses, two of them Favourite's, to the dim antiquity of "Jolly's Bull." Oddly enough, he just reversed Marmaduke's rule, as he has hitherto got all bull calves, save two. He is by Grand Turk, bred by Mr. Bolden, out of Victoria 8th, who was bought before calving for 60 gs., when she was cleyen years old. She never bred again, and was

sold as barren at the sale for 61 gs., leaving this splendid memorial of her brief stay at Bushey. Mr. Marjoribanks had every temptation to let him go, as Earl Fitzwilliam's agent and Mr. Cartwright, a Lincolnshire breeder, both bid close up for him; but the almost moral certainty of winning with him his first royal prize at Salisbury was worth thrice 375 gs. to Mr. Marjoribanks. His flesh and hair are very grand, and so are his hind-quarters and thighs, though he falls off slightly behind the shoulders, a fault which was the only one that any one could urge against him on the sale day. Of his bull calves, so far, three are white and three roan. Both Great Magician and Will-o'-the-Wisp have all their sire's fine quality and rich hair; but perhaps the former, as compared with his half-brother, might strike an observer as having a rather finer stamp of head, and the latter rather more length of quarter. Corporal Trim has a good deal of the Tempest character about him; and Jack Sprat glories in a white coat as curly as a Scot, or the love-locks on Statesman's forehead. The son and heir, Cock-of-the-Walk, out of Rosa Bonheur, is a very taking calf—a deeper and richer roan than his sire, and looks as if he had, with his fine straight top and his well-formed shoulders, an eye to the "Lammas Meadows" festival next July. Lord of the South, by Windsor II., out of Earring by Harbinger, is just eligible for the bull-calf class, and has a rare top and crops; and Baron of Bushey, by Bridesman, just seven weeks his senior, stands next him, and is, as Mr. Tallant terms it, "a true Lax," compact and well put together, and with fine character throughout. Tell Tale and Lady Butterfly were the only heifer calves; the latter right worthy of her dam Red Butterfly, and the very picture of her.

Only one more remained, and that was a little Alderney calf, the very image of a fawn, which was cosily housed in a pig-sty. We might well regard it, with Sir Lytton Bulwer, as

"At dusk and dawn a lonely Faun,
The last of the Grecian dreams,"

when coming weary with the contemplation of fore-quarters and sirloins to refresh the eye with a peep at future spare-ribs and bacon in the long range of pig-styces, we found that all their occupants save five were gone, and that no less than a hundred had been sold off last year. And so foiled in our search, we put up our note-book, and strolled into Mr. Tallant's office, as a refuge from the bitter wind; and when we had looked at the painting of the ancient steer, we once more sped back from those quiet pastures and straw-yards, to the "moil and dust of life" in the great lamp-lit metropolis of the world.

CHAPTER IV.

MR. WETHERELL'S HERD.

It is now upwards of forty years since this celebrated judge of Shorthorns first fell into the Durham fashion, and commenced breeding them, on the farm near Pierce Bridge, where he was born. The rising fame of his

native county in this department of pastoral enterprise had been about coeval with his own birth; and long before he commenced his maiden herd at Holm House, in 1816, "the haughty southrons" had learnt to regard Durham as a very Goshen of cream and beef, and as holding a sort of charmed existence, under such proverbially cold and weeping skies. In fact they had no excuse for thinking otherwise, seeing that for six long years, confirmation in the shape of—"The most wonderful Durham Ox, for whom his owner has refused the surprising sum of two thousand guineas; weighs thirty-five hundred weight; admission only one shilling" had been emblazoned on the front of a yellow caravan in almost every town and village in England; and they had been invited at all hours, personally, through a speaking-trumpet to "step up, Gentlemen, and judge for yourselves." Comet's thousand-guinea sale in 1810 had also been well buzzed about from farmstead to farmstead, till it traversed the whole length and breadth of the island. The majority of breeders considered, on hearing it, that Durham and the Collingses were playing either a very dashing or a very deep game; while more speculative philosophers, who could not have indicated the region of the sirloin if they had been led up to a beast, argued that, as the new shorthorned kind had originally come from Holland, the Comet biddings were only a revival in another shape of that Tulipomania which had once driven the country of dykes stark mad; and that our Government ought at once to interfere as theirs did.

Be this as it may, those spirited biddings which Mr. Wetherell heard as a lad beneath the lime trees at Ketton, were not lost upon him; and hence, eight years afterwards, he set out on the Barmpton day with a determination to go in merrily on his own account. Thirty-four of the cows, and four of the heifers under twelve months old, had been knocked down before he caught Mr. Robinson's eye; and then lots 41 and 43—Lady Anne and Cleopatra, both of them full of George and Favourite blood—became his for 100 and 133 guineas, and wended their way to Holm House that night. Their luck was rather chequered, as Lady Anne died in calving twins, and Cleopatra followed up a heifer which never bred, with the very first-class bull Belzoni (1709), by North Star (459). As he had hired this bull from Robert Collings, and used him for two seasons before the sale, Mr. Wetherell did not care to bid for him; but, although he was eleven years old, the "by Favourite, dam by Punch" strain induced that rare judge, Mr. Lax, to give 72 guineas for him. Time, however, proved him to have been the real lode star of the Holm House fortunes, as he got not only the famous Rosanna during his stay, but two rare bulls, Magnet (2240) and St. Leger (1414), the latter of which Mr. Wetherell sold to Mr. John Rennie, of Haddingtonshire, for 250 guineas. This was not Mr. Rennie's only high-priced purchase from him, as he gave him 500 guineas for three cows, whose portraits, in a long array over the Aldborough sideboard, still keep the memory green of his maiden herd. They were three sisters by Comus, out of a cow bred by Mr. Carter, of Theakston,

who was a near neighbour to old Mr. Booth, and made an extensive use of his bulls.

In 1828 Mr. Wetherell sold off all his Shorthorns, and left Holm House; and in 1833 we find him living "beneath the Gothic shade" of Durham Cathedral, and commencing a new herd at Newton Hall, some three miles distant. His spirit and fine judgment had still greater scope in this second essay. He bred the Duke of Clarence (9040) and King Dick (9269), and sold the latter at fourteen months old to Lord Hill for 120 guineas. He also gave 250 guineas for The Earl of Durham (5965), to Mr. Miller, of Ballumby, Perthshire, but he died in less than six months, leaving only three of his get behind him, which, by way of set-off to such ill luck, averaged 106 guineas at the hammer, when under twelve months old. The estimation in which the herd was held speaks best through the fact that at this sale in 1847 four animals realized 500 guineas.

It had been strengthened from time to time by very spirited purchases. Emperor (1839), with his dam Blossom, and his grandam Spring Flower, passed into it at Mr. Hutton of Gate-Burton's sale, for 250 guineas, 100 guineas, and 70 guineas each; and in 1846, Emperor justified his price by upholding the honour of the district, as first prizeman in the second class, at the Royal Show at Newcastle, against two dozen rivals. Mr. Banks Stanhope's prize heifer also met sixteen at the same show, and Lord Feversham's, Mr. Booth's, Mr. Trotter's, and Mr. Wetherell's, were all highly commended. Barmpton Rose was also an illustrious unit in the Newton Hall herd; but after Mr. Wetherell had bred Princess Royal from her, he sold her in-calf with Buttercup to Mr. Henry Watson, of Walkeringham, at her prime cost, 53 guineas; and at that gentleman's sale she and her nine descendants made 1033 guineas. Mr. Wetherell had originally purchased the mare Morsel for about the same sum, sent her to Physician, and sold her when she was in-foal of The Cure; and so, in this instance, the embryo calf Buttercup became the dam of Butterfly, who, when crossed with the once neglected Frederick, produced not only the unbeaten but the highest priced bull that the world ever saw. This is not Mr. Wetherell's only connection with the Towneley herd, as Mr. Eastwood purchased Blanche 5th, by Bates's renowned Duke of Northumberland, out of Blanche 2nd, from him, and bore off Roan Duchess, by Whittington, out of Red Duchess, by Cleveland Lad 2nd, as well. Red Duchess and Blanche V. were both bought by Mr. Wetherell from Mr. Mawe, who had in his turn bought Blanche V. from Mr. Bates. Mr. Eastwood's pair kept each other company, not only in the journey to Lancashire, but through their daughters in after-years, in the yard at the Chelmsford Royal, where, after passing into Col. Towneley's hands, Roan Duchess 2nd was first in the Cow class, and the red and white Blanche 6th next to her.

It was with Blanche 5th and Red Duchess that Mr. Wetherell commenced his third herd at Kirkbridge, in 1848; and three years after, The Earl of Scarborough, (by Roan Duke, a pure Bates bull,) who was bred by Mr. Mawe, and bought along with his dam at the Tetley

sale, carried off the head prize at Windsor, for the best bull in Class I. Still his success had many serious drawbacks, as twenty-four of his cows died of pleuro-pneumonia, and thirty-three cast their calves; but the herd was gradually rising into note once more, when, in consequence of circumstances well known, Mr. Wetherell gave up his Kirkbridge farm, where he had once hoped to end his days, and went to reside about a mile off, at Aldborough. He did not, however, relinquish breeding entirely; and, faithful to the blood of The Earl of Scarborough, he brought his daughters, Lady Scarborough and The Duchess of Northumberland (who goes back with two crosses of Belvidere to "Sockburn Sall," by John Coates's bull) along with him; and these, with Moss Rose, Cozy, and a few others, formed the germ of the fourth herd, which is just about to come to the hammer.

The herd, which numbers about fifty head, fifteen of them bulls, is at present located at the High Grange, near Melsonby, where Mr. Wetherell took quarters for them in consequence of not meeting with a suitable farm. A drive of three miles from Aldborough brings you to the spot, which is nearly the most elevated in the neighbourhood. Diddersley Hill, with its sparse covering of whin and heather, stands bleak and brown on the south, partially intercepting the view towards Richmond, which is seven miles away. There was once a castle on it, and as you pass through a half-crumbling turreted archway, you fancy that, even if it be only tenanted by the owls and the bats, there must of a surety be one still; but not one stone is left upon another. You soon find that your castle is in the air, and that you have just passed through the mere portal to a moor. Mr. Wetherell's holding is up two or three fields to the left. The farm-buildings look desolate enough, and exposed to all the fury of the west wind, but there is a snugness and comfort in all the arrangements down to the canvas curtains, and the whin bushes on the gates, which proves, without even seeing the result in the beautiful condition of the cattle, that Mr. Wetherell and his trusty herdsman, John Ward, have not battled with the elements in vain.

It was a pleasant change, after being almost frozen as we sat, to leave our gig and find ourselves among the bull calves in a comfortable stable, whose stalls have been boxed off for their little Heid-Book occupants. Royal Oak, by Lord Mayor (14828), out of Oak Apple, was on the extreme right, and the herd boy was soon at his side to make him hold up his head, and show off his handsome dark roan frame to the best advantage. He is a remarkably well-made calf, with a very broad back, straight quarters, and rich hair, and promises to be a high wrangler some day. Mr. Wetherell sold his sire, Lord Mayor, to Sir Antony de Rothschild, when eighteen months old, for 250 guineas; and his dam, Oak Apple, goes back through Anti-radical (1642)—which pretty well fixes *his* date—to the original Holm House blood in North Star. Next to him is perhaps a still sweeter calf to the eye, in the shape of Lord Aberdeen, who is rather a lighter roan, and with the most blood-like of heads. He is also by The Lord Mayor, out of

Moss Rose, and she was shown in-calf with him at Aberdeen, when she was second to Mr. Douglas's Britannia, for whom that gentleman gave Colonel Towneley 500 guineas. Comfort, a white heifer out of Cozy, the dam of Lord Mayor, next claimed attention for her own and her half-brother's sake; and then we found the meaning of the two names exemplified to the full as we passed into the first yard, which was quite a straw paradise, such as departed Victorias and Bracelets may be supposed to revel in when Royal Society and breeding toils are o'er.

The roan Passion Flower, by Whittington (12299), out of Magic Flower, was the first to come forth on the left, and, like old Cozy, she has never been in public. She is a great milker, and shows a great deal of breeding, combined with fine handling, and rich hair; but she is not quite so good-looking as her sister, Windsor Flower (so called after her sire's victory there), who was sold to Mr. Stirling, of Keir, for 250 guineas. The white Lady Scarborough followed, and is *stately* in her presence, as her dam was in name. Her fine broad back, prominent breast, and round ribs, are her especial points, and she is in-calf to Alderman. Lord Scarborough and Statesman are both out of her; then comes the heifer Silver Bell, who was sold to Mr. Marjoribanks when a nine months' calf for 100 guineas; and last of all Stanley, own brother to Statesman. Her ladyship has more elegance than Cozy, by Cothertstone, who was turned out by her side, and seemed a fine large roan cow, whose contour was rather destroyed by a slight temporary injury to one of her eyes. Two roan Lord Mayor calves—one of them Lady, out of Countess, and the other Bloom, out of Lucy—of the Killerby blood, succeeded. Both are the same age to a day; but good as Lady is in every point, Bloom would beat her if they came together, and we doubt if there is anything much superior to her in the herd. Next came Roseleaf, by Whittington, a thick good heifer with a white heifer calf by Lord Scarboro'; and then the bull side of the yard was opened, and the white Catton, the dark red and white Lumley, and the white Stanley, dashing out playfully with tails erect, made us the centre of such an impetuous triangular duel, that at first we were for taking refuge, notes and all, in an ignominious flight. However, they soon came to a truce, and our peace of mind was restored. The two first are capital specimens of Lord Scarboro's get, out of Young Magic Flower and the Duchess of Northumberland; and Catton especially has a wonderful back, and is very rich and fine in the hair. Stanley is also very well made, and bids fair to be as good a bull as his brother, to whom he is as like as he can be.

When these young roysterers had been dismissed to their boxes, we had the treat of the afternoon, as John Ward and his aide-de-camps grouped the three Roses—Moss, Ayrshire, and Stanley—side by side, in the yard. The roan Moss Rose, who is in calf to Statesman, and will be six in April, stood at the head, showing off well that rare back and loin and round ribs, over which the judges at the agricultural societies have so often pon-

dered. She was bought from Mr. Harrison, of Greta Bridge, as a six months' calf, along with a bull, for 120 gs., and is through Cotherstone (6903) and Nancy, of full Killerby blood on both sides. Her public life has been latterly like Yellow Jack's and Hyllus's on the turf, a series of splendid seconds. In 1857 she was first, it is true, at Middlesboro' and Barnard Castle; but then came a H. C. at Salisbury, and a second to Nectarine Blossom at Sunderland, and to Victoria at York. Last year she and Mr. Douglas's Britannia were always at cross purposes, and it is curious to note their rise and fall in the judicial barometer. At Chester, when Nectarine Blossom won, Moss Rose was highly commended, and Britannia passed over; and at Aberdeen Britannia won, and Moss Rose was second. Nectarine Blossom then reappeared on the scene, and kept up her Chester charter at Northallerton, where Moss Rose was second, and Britannia highly commended. Her daughter Ayrshire Rose by Whittington, who is in calf to Wisetonian, has so far run a successful course among the white and green ribbons, as she has been first at Barnard Castle and Grantham, and second to the renowned Queen Mab at The Durham County. Still, perhaps, the eye will insensibly rest upon the youngest Stanley Rose, by Earl of Derby, as the fairest of the lot, and the most likely to give Mr. Booth and the rest of the short-horn trainers some trouble in shows to come. Rose of Athelstane and Queen of the Vale were both before her at Northallerton; but she beat the latter in turn at Sunderland, and since then she has gone on improving. Her thighs, twist, and shoulders are especially fine, and we could have stood there much longer, just for the sake of seeing her lift her gay little head, and come marching straight towards us with that massive Bride Elect bosom, as proudly as if the Warwick wreath was already her own.

When this celebrated trio had returned to "the place from whence they came," Wisetonian, whose sire and dam, Usurer (of whose character he has caught not a little) and Sybil, both by Lord Warden, were sold at Lord Spencer's sale—made his bow. He was followed by Alderman, by Earl of Derby out of Cosy, who is very first-rate in the union of the rib and loin, and has peculiarly long hind quarters. Earl Derby's greatest son, however, was still to come in Statesman (a delicate compliment we presume to Lord Stanley), and in a minute or two that curly white head, which first saw the light on the 20th of November, 1855, was seen looming in the distance. He is a very grand bull, whether you stand beside him and admire his true cylindrical shape

and fine length of quarters, or measure him 26 inches from the huggins, without any of that "nipping 'em," which "Cuddy" so deprecates. As yet, he has only earned two H.C.'s from the Royal Society in 1857-58, when Bon Garçon and Fourth Duke of Oxford won; and the latter just beat him again at Northallerton by his marvellous handling. Still he was first last year, not only at Sunderland, Grantham, and Guisborough, but ousted Heir-at-Law at Aberdeen, after the latter had beaten all Ireland to smithereens at Londonderry. His brother Lord Scarborough followed; but although he has rare quality, and an exceedingly good head and back, his shoulder-points are not quite so correct as they ought to be, and hardly close enough to the neck vein. The white General Havelock by Whittington is rather a good thick-fleshed, than an elegant show bull; but he bore his part with Venus, Alderman, Ayrshire Rose, and Stanley Rose, in sweeping off every shilling on the shorthorn prize-board at Barnard Castle, last autumn.

Anon we adjourned to a range of boxes behind, from which Venus, by Whittington, and a winner at Guisborough, was first ordered out, and certainly she is as sweet as her name, which she bids fair to perpetuate in her calf, Governess, by Archy Moore; whom we had seen along with the white Bell Flower, by Statesman, in the first yard. Governess is the only calf that Archy Moore ever got for Mr. Wetherell, as he was very early sold to go to Australia. He was a son of Field Marshal (12875), whose daughters—Crocus, Countess, Cobweb, and Cowslip, all of them roans, and Crocus, perhaps, most to our mind—were housed in pairs hard by. Wall Flower also struck us as a very good cow, soft and of remarkably fine quality. She is the dam of Bell Flower and Water Witch, who departed to Bushey Grove, as a six months' calf, for 50 gs. Lady Stanley and Miss Lumley were the last brought out for view, both of them with a strong dash of the Cotherstone blood in their pedigree, through his son Crusade, whose winning powers were well known, not only in the Highland and Yorkshire Societies. The former was, perhaps, rather the compacter built, and the latter, better in the hair; but grand as the herd was, it was difficult to get up one's enthusiasm beyond zero on so bitter a day, and we gladly turned our back on the High Grange, and its high-bred tenants, with the hope to meet them again under a milder climate, and amid biddings fast and furious on the coming nineteenth of April.

THE COMPOSITION OF LIQUID MANURE.

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

The opinions of the English farmers as to the composition and use of liquid manure are commonly much too unsatisfactory. This want of accurate information, as might be expected, has often

caused considerable disappointment and waste of capital, and thus the returns from the use of liquid manure have seldom sufficiently rewarded the owner for his outlay. The researches, therefore, of Pro-

fessor Voelcker, just brought before the public, will be highly useful. They will assuredly tend to convince the farmer of the advantage to be derived from the analysis of the proposed liquid fertilizers, so as to enable him to place a money value upon their contents.

The great error in using liquid manures usually consists in not reflecting that these must be divided into two great classes: first, those which are highly concentrated; and secondly, those extensively diluted with water. The action of these upon the soil are too generally regarded as precisely similar—although we must see, upon a little reflection, that while the chief value of the first class consists in their solid contents, the fertilizing power of the other commonly resides in an equal degree in their watery portion. Thus the Flemish farmers dress their sandy soils once or twice annually, with only ten hogsheads per acre at a time, of their rich liquid manure; but the Italians, who use the waters of the Po mixed with the sewage of Milan, and the holders of the Edinburgh and Clipstone and Hampshire meads, who have also a very diluted sewage manure, apply it by hundreds of tons per acre, repeating the soakage in some places every eighteen days during the greater portion of the year. The rich liquid manure of Flanders, of which we have heard so much, is in fact *regularly manufactured* by almost every Flemish farmer, in capacious tanks. We are told that these skilful cultivators would as soon think of parting with their cowhouse or their plough as with their tank; and no expense or trouble is spared, it seems, to keep it well supplied. The farmers of Belgium would place little value upon some of the merely discoloured waters which we are ever and anon apt to dignify with the name of liquid manures. Let us dwell for a moment upon the description of the liquid manure, which I had some time since occasion to give, prepared by the continental farmers, and ask ourselves, whether this at all resembles the kind of fluid we have been wont to so hopefully experimentalize with? The Flemish farmers' liquid manure is obtained by collecting and fermenting the drainage of their stables and stalls into underground reservoirs or pits till it attains a *slimy* or *mucous state*. It is usual to allow this fermentation to continue for some time. There is in Flanders a difference of opinion as to the best *age* of the fermenting liquid; some of the chief farmers consider it should be six months old before it is used. By this protracted fermentation some of the solid portion of the manure is rendered more soluble, whilst a considerable quantity of ammonia is formed, and dissolved in the liquid. Sprengel found that a given portion of the urine of the cow, which when fresh contained 205 parts of ammonia,

held 487 after it had been fermented, and 1,622 when (previous to fermentation) it had been mixed with its own bulk of water (*Farmers' Almanac*, vol. ii., p. 47). If then, I repeat, we remember a few of these useful facts, we should not be so apt to expect a profitable result from the use of a very limited portion of merely discoloured pond water.

The experiments of Professor Voelcker, to which I have already referred, were made upon six specimens of liquid manure, and these were obtained (*Jour. Roy. Ag. Soc.*, vol. xix., p. 522).

1. From Westonbirt, near Tetbury.
2. From Badminton.
3. From the Royal Agricultural College Farm at Cirencester, collected in 1857.
4. From the same, collected in 1858.
5. From Tiptree Hall, clear liquid.
6. From the same, muddy liquid.

They all had a dark colour and disagreeable smell. And what is a very useful fact to remember, their specific gravity corresponded with the amount of solid matters which each kind contained. So that this affords a very easy way of ascertaining the value of a decomposing liquid manure, since to a certain extent the specific gravity of these liquids may serve as an indication of their relative fertilizing power.

The solid contents of the liquids examined by the Professor, and their specific gravity, will be found in the following table. These then contained, of organic and mineral matters, in grains per gallon, and were of specific gravity, as follows, viz., that from

	Solid Contents.	Sp. Grav.
Westonbirt	418	1'006
Badminton	601	1'007
College Farm, 1858	111	1'0014
Tiptree, clear liquid	29	1'0006 (sic)
Tiptree, with sediment	95	1'001

These specimens contained of phosphoric acid and of nitrogen, in different states, equal to ammonia, the following amounts, given in grains per gallon.

	Phos. Acid.	Nitrogen.
Westonbirt	2'7	114
Badminton	9'5	22
Cirencester, 1857	2'3	26
Ditto, 1858	4'8	37
Tiptree, the clear	2'3	4
Ditto, the muddy	3'7	5

From these and other data the Professor proceeds to work out the most valuable practical portion of this and similar enquiries, viz., the economy of distributing on the land the liquid manures thus analyzed. He takes as a basis for his calculation the estimate of Mr. Mechi, that the cost per ton of delivering liquid manure at his farm may be taken at from 1½d. to 2d. per ton, and that upon an

average from 45,000 to 50,000 gallons per acre, are annually distributed by the steam engine through pipes over his Tiptree Farm; or at from about 200 to 223 tons per acre. Such a large amount, if it were only mere water, however, must be productive of considerably good effects: it is equal to a depth of two inches of water per acre, or one-tenth more than the average fall of rain in Essex. The value of this large amount of water, especially for grass land, must be considerable; it is one, however, which the Professor does not include in the following estimate of its value. He observes, when speaking of the Tiptree liquid manures, that, "assuming its composition not to vary materially at different periods, 50,000 gallons of liquid manure, with the sediment, would yield 50,000 + 5·476 grains, or 273,800 grains, or in round numbers 39 lbs. of ammonia.

"Peruvian guano yields from 16 to 18 per cent. of ammonia. To produce the above-mentioned 39 lbs. of ammonia, we should require 2 cwt. of Peruvian guano of the best quality. At £13 per ton, the 2 cwt. would cost 26s. For this outlay of money the same amount of ammonia would be obtained which is yielded by 50,000 gallons of Mr. Mechi's muddy tank-liquid.

"Deducting the clay and earth which swell the amount of solid matter in the muddy tank-liquid, and taking no account of the suspended organic matter, which may be done with propriety, since account has been taken of the nitrogen, the only valuable portion in it, we have as nearly as possible the same weight of solid matter in 2 cwt. of Peruvian guano which is contained in 50,000 gallons of the Tiptree liquid manure. But the solid constituents of Peruvian guano being more valuable than those in the liquid, a balance would be left in favour of guano. Allowing 4s. for sowing 2 cwt., 30s. would cover the cost price and expense of applying the guano.

"If 1 ton of liquid manure, according to Mr. Mechi's estimate, costs for delivery 2d., 50,000 gallons=500,000 lbs., will cost £1 17s. 2d.

"The fertilizing matters in 50,000 gallons of liquid manure thus will cost for delivery 7s. 2d. more than the price of the materials and expenses of application would amount to, were they put upon the land in the shape of Peruvian guano. Whether or not it is good economy to spend £1 17s. 2d. for the delivery of fertilizing materials which are intrinsically worth about 26s., or at the most 30s., is a question which may be safely left in the hands of practical men. It is a question which, I think, cannot be answered in a general way. On some soils, I believe, even a larger expense for delivery may be incurred, whilst on others less than a quarter the expense may be ruinous."

The nature of the soils to which liquid manures are most beneficially applied, varies almost as much as the ordinary composition of these fluids. As a general rule, the deep light sandy soils, resting on a porous substratum, are the most benefited by these fluids. It is true that the loamy clays of the Tiptree Hall Farm are benefited by the application of even 200 tons per acre, of a weak liquid; but then this well-drained farm is situated in, perhaps, the driest portion of the driest of our English counties; and then again, in other cases, as in the successful application of the urine of the horse, by Mr. Dickenson, to Italian rye-grass, on the strong clays of Middlesex, the application was so successful, not for its *amount* of water (it was, in Mr. Dickenson's case, applied from a common street watering cart), but for the ammonia, and other matters which the liquid (one-part water, two-parts urine) contained. The composition of the urine produced by the horses, the cows, and the pigs of Mr. Huxtable, collected together in the same tank, and quite undiluted with any other drainage, was some time since ascertained by Professor Way (*Jour. Roy. Ag. Soc.*, vol. x., p. 613); and it may be useful to remind the farmer that the following analysis exhibits the composition of the putrid urine or tank-water of the homestead, after almost all its animal matters have passed into the state of ammonia; but, as the Professor adds, with this exception, there is no difference between the urine in the two states, and the analysis for all practical purposes equally represents the value of fresh tank-water as a manure. Two analyses were made of the urine from the Huxtable tank. The mean result was that each imperial gallon contained 356·45 grains of ammonia per gallon. Each gallon contained 1208·42 grains of solid matter, viz.—

Combustible matter	397·63
Incombustible matter	810·79

The incombustible matter or ash was composed of—

Silica	8·18
Phosphoric acid	8·91
Sulphuric acid	105·16
Carbonic acid	100·05
Lime	21·24
Magnesia	9·49
Peroxide of iron	14·02
Potash	353·01
Chloride of potassium	34·86
Common salt	152·26
Sand	3·56

810·74

The analysis of this powerful liquid manure is of the more general importance, since almost every stock-owner has the power of collecting it in considerable quantities. It may be applied, too, in either the fluid state, or what in some of the German

States is deemed the better practice, by causing it to be absorbed in heaps of earth, or other collections of dry porous materials.

There is another powerful liquid fertilizer—sewer-water—which is also of very considerable importance, and this will, I trust, be remembered by my friend Thwaites, and the other metropolitan commissioners, when they are constructing, in the counties of Kent and Essex, the great intercepting sewers for London and Southwark. The reader must not, however, suppose that the strongest sewer-water is nearly as rich in ammonia as the urine of his live stock. Some specimens of London sewer-water, examined by Way (*Jour. Roy. Ag. Soc.*, vol. xv., p. 153), contained about 41·26 grains per gallon, another 17·96 grains only. But these, although poorer in ammonia than the urine of the farm-yard sewage, have commonly the greater advantage of being obtainable in much larger proportions. And let me again repeat, in all ordinary applications of solutions to our crops, more especially to the grasses, the *quantity* applied can hardly, in our climate, and on porous soils, be too copious, or too frequently repeated. This fact is constantly impressed upon me, in my own experimental plot of grass land, watered by sewage.

For wherever, through the occasional imperfect repair of my distributing troughs, even a slight dripping of the fluid takes place, there the grass around grows with a far greater rankness than on any other portion of the plot.

We may conclude, then, as a guide for other and more varied trials, that it is an error to suppose that weak liquid manures can be usefully applied to our growing crops in very limited proportions, but that especially for our pastures we can hardly repeat the watering too often. At Edinburgh they thoroughly sewer-water their grass at intervals of about 18 days, and the Scotch farmers prefer it when in its richest state, that is, when it flows to them in continued dry weather. Let us remember these things, when we are applying liquid manures, and not fall into the too common error of rendering a most valuable agent worthless by over-taxing its powers. It is the more important that the composition and use of liquid manures should be well understood, since there is little doubt but that the agriculturists of our country, when the legal and other obstacles which have hitherto retarded the use of fluid fertilizers are removed, will reap a rich harvest by their extended employment.

STEAM CULTIVATION.

TRIAL AT TEDDESLEY PARK, STAFFORDSHIRE.

Some years ago an amiable and chivalrous nobleman sought to revive the gallant pastimes of the middle ages. With no small trouble and expense he succeeded in getting up a pageant, which was styled a *Tournament*, and in which gentlemen most uncomfortably cased in armour, broke innocent lances upon each other's plated breast, and were duly rewarded for their prowess at the hands of a Queen of Beauty. Happily for the good sense of Englishmen this chivalrous re-enactment has not been repeated, and other pursuits more in accordance with national tastes and the spirit of our times now engage the leisure hours of our aristocracy.

It was a pageant of a very different nature that attracted a large concourse of people to Teddesley Park on Tuesday last. The interest all seemed to feel in the announced tournament must have exercised a very strong sway over the visitors' minds, to have induced so many to encounter the blast of the hurricane that blew, and the torrents of rain that fell. The venerable old oaks, and the magnificent beech plantation in the park, groaned as they bent under the storm that hissed and howled through their leafless boughs. The cattle themselves had sheltered under the lee of hedges; and yet men of all ranks were seen plodding their way, bending to the blast, some on foot, some on horseback, some in vehicles, towards a large field at some distance from the

farmstead, where the trial was to take place. There the four rival schemes for the application of steam to the cultivation of the soil had been invited by the noble proprietor of Teddesley to a challenge trial of their respective merits.

Although the weather was as unfavourable as it could possibly be for the bystanders, its severity did some service in reducing the trial to two competitors only. Four systems had been announced for competition; but only three machines made their appearance on the field of battle, and these were Mr. Fowler's steam-plough, Mr. Smith's cultivator, and Rickett's digging machine. Bray's traction engine was nowhere to be seen. On the day previous, each champion had selected his own ground; and at an early hour on Tuesday the steam was seen torn in thin shreds by the wind on three different parts of the field. Rickett's digging machine, which had propelled itself that very morning from Stafford, attempted to get upon the land; but the most strenuous efforts could not accomplish this object, and it had ultimately to withdraw altogether from the contest. Evidently Mr. Rickett's beautiful machine, ingenious though it be, is not calculated for doing work upon moist ground.

Now the two earnest rivals had the ground to themselves, and, nothing daunted by the rain and wind, they

went to work with all the eagerness of a life-and-death struggle. Smith's apparatus was his five-tine cultivator, and the machinery was that used by Lord Hatherton upon his own farm for the last two years. The labourers, all belonging to the estate, were evidently quite *au fait* of their task, and it was an interesting feature of the day's trials to watch the regular working of the implement. No stoppage, no hitching anywhere; everything went on as smoothly as if the cultivator had been drawn by a pair of well-trained horses. At each end a simple reversal of the gear turned the implement short upon itself, a lifting of the hand being the only necessary signal. As to the work accomplished, nothing could exceed its perfection. The whole surface, beaten though it had been by the treading of folded sheep, and the hard rain which still fell now and then in torrents, was beautifully *smashed up*, to use Mr. Smith's own graphic expression, and the whole staple thoroughly pulverized to a depth varying from eight to nine inches.

Mr. Fowler, on the other hand, was trying also a kind of cultivator adapted to the balance-beam of his well-known plough; but the tines, arranged in a single diagonal row, though they were six in number, utterly failed to accomplish their object. The soil was loosened, it is true, to a depth of about nine inches; but owing, no doubt, to the disposition of the tines, the surface was not nearly so well pulverized as with Smith's cultivator. A single glance sufficed to determine on whose side was the palm of superiority.

Both implements were carefully timed; and it was found that Smith's cultivator broke up 1 acre 1 rood 18 perches in one hour and a-half; whereas Fowler's did only one acre during the same space of time. The inferiority of Fowler's cultivator was so evident, that a further trial became quite useless. Mr. Fowler gave up the contest; but his matchless swing-plough was then attached to the gear, and on it went as it is wont to go, fully redeeming the cultivator's defeat.

If any one present had come to the trial-field with any doubt in his mind about the practicability of steam-ploughing, he must have returned home a wiser, because a convinced man. On, went the plough with its four shares, not only upturning the soil, but thoroughly pulverizing it, and leaving it in that mellow, spongy tilth which is the goal of every ploughman's ambition, and which can only be accomplished with steam as a motive-power, and an implement which leaves the surface without even the tread of a ploughman.

Fowler's gear on this occasion was the same as that I showed at Chester; but it is right to state that his machinery has undergone, since that time, several radical improvements, which, by rendering it more simple and less ponderous, have greatly increased its power and efficiency. With the new gear no strap is needed, and therefore the difficulties arising from a wet day are entirely removed. A shaft with cog-wheels is directly connected with a drum fixed beneath the boiler, and round which the rope is wound up several times in grooves, as with a pulley; and it is through this shaft that motion is communicated to the endless rope. We recently saw this improved machinery at work near

Chelmsford, and can testify to the beautiful simplicity of the gear and the singular efficiency of its working. It is to be regretted that circumstances should have prevented Mr. Fowler from bringing this improved tackle upon the trial-field at Teddesley; for, although he exhibited a small model of it, yet nothing short of the actual working of that beautifully-contrived machinery could give an idea of its transcendent merits.

It would be invidious, and to a certain extent out of place, here, to establish a comparison between the two rival systems that tried their respective efficiency on Tuesday. The controversy has waxed too hot, of late, to induce us to side with either party; and yet we are compelled to draw some conclusions from what we observed. We do so fearlessly, for we have the consciousness of having no bias towards either party, and also because the difference between the two systems is sufficiently marked, to render the task of our criticism comparatively easy and less liable to recrimination.

We think that everyone who witnessed the trial, will agree with us in saying, that no implement can compete with Smith's cultivator, in simplicity, easy working, and efficiency; and it is obvious that for the purpose of breaking stubbles and other autumnal operations, and cleaning land by exposing the weeds on the surface, instead of burying them as it is done with the plough, Mr. Smith's system is unrivalled. On the other hand, when plough work is wanted—that is, when the land is in that state of thorough cleanliness which is the rule of good farming, and when the under part of the staple needs be exposed to the influence of the atmosphere to renovate its fertility—Fowler's swing plough knows no equal.

As regards the gear we rather hesitate to express an opinion. It is obvious that this is the knotty point that forms the gist of the controversy between the two systems. Without assuming the right of deciding this vexed question, we think it useful to point out the considerations which ought to decide which traction is the best. It is acknowledged by all who have either paid attention to steam cultivation or practiced it, that one of the most serious items of its cost, is the wear-and-tear of the wire rope. The whole question between the windlass and the pulley systems lies in the settling of this point. On the one hand, it is obvious that with the windlass a greater length of rope is necessary; and if greater power be used, such as is required in ploughing for instance, we apprehend that the tight coiling of the rope upon the drums, would seriously injure it by the pressure it would have to bear; whereas, with the endless system this evil is not to be apprehended. There is another point upon which some doubts exist in our mind, and that is, whether Mr. Smith's shifting anchors could stand the strain of a 12-horse power engine. Even with the comparatively light draught of his cultivator, we observed that the man in charge had to maintain the anchors with a lever to prevent their slipping; and there naturally arose in our mind the question, what would be the result if a heavy four-furrow plough had to be pulled, instead of a light cultivator? We leave the decision of these points to those whom it may concern; but one thing is certain

—and it may be pointed at by Mr. Smith as an answer to any criticism of his system—the machinery, gear, and implements that we saw at Teddesley on Tuesday last most admirably accomplished the task they had to perform; and as nothing else was aimed at by Mr. Smith on that trial, he may justly claim the palm of victory. But had it been a ploughing match, Mr. Fowler would have most undoubtedly established the unrivalled superiority of his system.

Mr. Williams, of Baydon, had sent his newly-invented cultivator; but owing to its not being provided with drums to haul up the slack of the endless rope, it could not be attached to Fowler's gear. However, late in the day, when all the company had left, temporary arrangements were made, and it was propelled a sufficient

length to test its great excellence and efficiency. The work, in fact, could stand a comparison with that performed by Smith's cultivator, and it has the farther merit of taking a breadth of six feet, which must greatly expedite the work. Altogether, we think that this cultivator is likely to draw the attention of steam agriculturists, as it is certainly contrived with singular ingenuity and practical experience.

It is but just to record the excellence of the arrangements made by Lord Hatherton and his agent, Mr. Bright. The most bountiful hospitality was extended to all visitors; and the keen blast that swept over the trial field, the piercing cold rain, and constant exertion thereby rendered necessary, sufficiently whetted every one's appetite to render excellent fare the more welcome.

THE STATISTICS OF AGRICULTURAL PROGRESS.

It is well for the agriculturist to get "a wrinkle" now and then from those marvellous men of business in the great cities. While we have none but conjectural farming statistics to dazzle the world with, what a sensation are the manufacturing classes able to make with the exact number of their spindles, the list of furnaces in work, and such details as those we now subjoin! Of course these "textile" people form only a small portion of the vast population of "cunning craftsmen" occupied also in "fictile," "ceramic," chemical, iron, and all sorts of metallic manufacture, besides innumerable industries in wood-work, stone-work, machine-making, dyeing, mining, quarrying, and the fabrication of articles of dress, ornament, or utility. But if the clever fellows engaged in those particular branches are content to let Government keep national books about them and their proceedings, without being deemed unwarrantably inquisitorial, and with advantage to their art or business, why should we farmers dread the prying eye of public "enumerators," or either refuse or else falsely fill up the columns of their schedules? The Census busybodies did get out of us how many folks are farmers and graziers; how many labourers we employ; how many of our agricultural counties are unable to provide work and subsistence to the hands and mouths born in their towns and villages, and are thus obliged to draft off their multiplying inhabitants to the big factory districts, or drive them away as emigrants to strange countries, to grow bread in the wild back woods, or shear sheep in the wilderness. Would any harm be done, would not encouragement be furnished by collected and published "returns" of such items in agricultural progress as the increase in number of acres subsoil-drained, the amount of steam or other motive-power applied to farm purposes, and so on? Take the following as an instructive and suggestive example:—

Factories for spinning and weaving cotton, wool, worsted, flax, and silk in the United Kingdom.—(From a Parliamentary Paper, Session of 1857.) The number

of these factories in 1856 was 5,117, worked by 137,711 "horse-power" of steam, and 23,724 "horse-power" of water-power, and employing 682,497 male and female workpeople. The history of the increase of motive-power is told by the following table:—

The "horse-power" was,

in the year	Steam.	Water.	Total.
1838.....	75,083	27,926	103,009
1850.....	108,113	26,104	134,217
1856.....	137,711	23,724	161,435

—the increase of power from 1838 to 1856 being no less than 58 per cent.

Can anybody tell us what amount of steam and water-power the agricultural industry of the country employs, in addition to its great team of about a million farm-horses and oxen, and how fast is the use of steam engines extending? Have we now 15,000 or 20,000 farm-engines at work, of the united "power" of 120,000 to 160,000 horses, and increasing at the rate of 2,000 engines every year? Perhaps Mr. Mechi will be able to furnish some pretty sound estimate, when the subject comes before the Farmers' Club next May.

The increase in the number of hands employed in the factories under consideration has grown, we are happy to say, in a more rapid ratio than the application of mechanical motive-power.

In the year 1835 there were	354,684 hands.
" 1838 "	423,400 "
" 1850 "	596,082 "
" 1856 "	682,497 "

—the per-centage of increase from 1838 to 1856 being 61, while that of the power was 58.

What have the agriculturists to say on this point? It is a fact that during the twenty years from 1811 to 1831 the number of families engaged in farming pursuits increased only 7 per cent., while those of the whole of Great Britain increased 34 per cent.

The following table shows at a glance the ratio of progress in activity and industry of the different branches of manufacture referred to:—

Increase per cent. (in decimals), 1838 to 1856.

No. of Factories.	Power.	Hands.
Cotton .. 21.495	62.419	46.355
Woollen. . 13.842	25.929	44.305
Worsted. . 26.201	107.692	177.583
Flax 6.377	65.226	84.268
Silk 71.641	52.955	63.650

In looking at the first tabular statement of motive-force employed, represented by mechanical "horse-power," it will be observed that while the total increase is great, there has been a steady diminution of the amount of water-power, the total increase of power being due to the multiplication of steam engines, which—with those of new factories, those erected in lieu of water-wheels, and those substituted for engines of smaller power—have nearly doubled in total effective force in a period of only eighteen years.

The substitution of the unremitting and constant power of steam for the fluctuating and uncertain power of descending streams is a hopeful indication for the farmers and inhabitants of low lands and valleys, for so many rivers and watercourses will run the freer, with improved district drainage, and healthiness following as a consequence. No one has yet ascertained the amount of water-power engaged in driving not factories only, but the myriads of flour mills and "works" of all kinds throughout the length and breadth of our

country wherever rivers are found to flow. Data for comparing the power thus taken advantage of, with the extent of the mischiefs occasioned by the damming back of the streams which are every year being required to discharge larger volumes of drain water, would be exceedingly valuable. And were the state of the case clearly made known to the nation, we should soon have a substitution of steam for water-power along the course of many rivers, the abolition of mill-wheels altogether in some districts, and a vast augmentation and extended use of the water-power in others.

Whether it be possible or not to ascertain how many portable and fixed steam-engines, and of what combined power, are employed in thrashing, chaff-cutting, grinding, pumping, sawing, &c., for "the agricultural interest" we hope that steps will be taken to keep a record of the number of steam-ploughs and steam-cultivating machines supplied to farmers from the commencement of the new practice now fairly inaugurated. By-and-bye we shall be able, with such facts before us, to estimate the total saving in labour, the number of horses displaced, and their share of provender given to beef-making animals instead, and the probable increase of produce and advantage to our husbandry—now threatened with various discouragements and low prices, that make long faces.

THE CORN LAWS OF FRANCE.

A considerable degree of agitation prevails in France at the present moment, on account of a new corn law, a draft of which has been presented to the Chamber of the Council of State, for their consideration and approval, by the Minister of Agriculture and Commerce.

In 1821 a law was passed for the establishment of the sliding scale, which was remodelled in 1832, and continues the law to the present time; but in 1853, in consequence of the deficiency in the crop of wheat, a decree was promulgated suspending the law for the time being, and this suspension has been annually renewed every year since, without repealing the law of 1821. During the intervening period of thirty-eight years there have been nineteen years of low prices, and nine years of absolute scarcity. In these latter seasons France was only saved from famine by the temporary suspension of the sliding scale; whilst in years of abundance the law had no effect in preventing low prices, for during the nineteen years referred to, the average price of wheat was under 15 francs per hectolitre (or about 4s. 6d. per bushel). The effect of the law has proved very injurious to the farmer, for it prevented him from exporting wheat, except when the price was at the minimum; whilst, on the other hand, it allowed importation only when that grain had attained the maximum price.

The question of the abrogation of the law of 1821 is considered as decided, every enlightened person in France being convinced that it is no longer in accordance with the actual circumstances of the country. It therefore remains the subject of debate with the French

people, whether an entire free trade in corn, or a fixed duty for the purpose of protection, should be resorted to. The former, we believe, is likely to be adopted, with the reserve of a duty, as a measure purely financial, of 1 franc per hectolitre (or 2s. 6d. per imperial quarter) on importation; exportation to be at all times free.

This alteration is strongly opposed by the agricultural committees of different arrondissements, and by some of the French writers; not, however, on the ground formerly taken, of the inability of the French farmer to compete with foreigners, but on that of the protection granted to the iron and coal trades, which compels them to buy those materials at the dearest market, whilst they sell their corn, silk, wine, and madder at a cheap one. There is reason in this objection; and we can hardly think that the French Government, in adopting free trade in corn, will allow the protection laws on iron and coal to remain on their code.

The benefit of the decree suspending the sliding scale, and admitting the free export and import of corn, received a very satisfactory illustration last year. The imports of wheat and flour for 1858 amounted to 1,431,044 metrical quintals (about 2 cwt. each), whilst the exports reached 4,224,963, being an excess of exports over the imports of 2,793,919 metrical quintals. One of the chief arguments of the advocates of the sliding scale is, that, if a free trade at all times is established, the ports of the Mediterranean seaboard will be inundated with wheat from Egypt and Southern Russia; or, at any rate, the *fear and apprehension* of such an influx will

tend to keep down the price of wheat in the Southern Departments. But M. de Lvergne, who is a powerful advocate for the abolition of the sliding scale, and of free import and export at all times, shows that this apprehension is founded on wrong data. In *Le Journal d'Agriculture Pratique* of the 20th January last, in animadverting upon an article in a previous number by M. André, he writes: "They can," he says, "bring to the French ports of the Mediterranean, Russian wheats at less than 10 or 12 francs per hectolitre in ordinary years, including the expense of transport, and the profits of commerce rated as high as we can imagine them; and when we reflect that Russia has every year an excess to export of 50 or 60 millions of hectolitres, we see nothing but imminent danger in free importation.

"Certainly, if these facts were true, the danger would indeed be very great; but are they true? Turning over a few leaves, I see, at page 43 of the same number, in the table of the prices current of agricultural produce, the actual price of wheat at Odessa, and find it to be 16 f. 70 c. for the first quality, and 15 f. 50 c. for the average qualities, which are both higher than in three-fourths of France. How to reconcile these prices with the affirmation of M. André we cannot conceive. Which is it that is deceived, he or the price-current? What compels me to believe that it is not the latter, is, that during the whole course of the year 1858, notwithstanding the incessant operation of free importation and the lowness of our own prices, that of wheat has never fallen at Marseilles below 18 francs per hectolitre. Where, then, are the fifty or sixty million hectolitres that Russia can export every year, and which can be poured into our ports at 10 francs?"

This argument is unanswerable, especially when it is further considered that France, like the United Kingdom, is an importing rather than an exporting country,

and that she has required an excess of imports, on an average of 30 years, of at least 1,000,000 hectolitres per annum, to make up the consumption. That country is at the present moment, like England, suffering under a plethora of wheat, the result of two favourable years, and the price has been accordingly reduced—certainly not by the largeness of the importation.

We are glad to find France at last disposed to reciprocate with England in the freedom of commerce, there being every reason to expect that the other continental governments will in time follow the example. Belgium, Holland, Sardinia, and Switzerland have already adopted it, and with the best effect. It is this, and this only, that the British producers, whether agricultural or manufacturing, require, to enable them to compete with all the world. "A clear stage, and no favour," is their motto; and a few years of perseverance will, we firmly believe, put them in possession of it.

We will not conceal our opinion, however, that in France the farmers stand on a different footing from those of the United Kingdom, and that in order to reap the benefit of any change in the law, an entire alteration of the land system is indispensable. Whilst the present law of inheritance exists, and the land is liable to continual subdivisions as successive inheritors die off, until the holdings are reduced in size to mere patches of cottage garden ground, no improvement can take place either in the culture of the soil or in the condition of the cultivators, to enable them to stand against competition or bear the results of the vicissitudes of seasons. This is a consideration which will ere long force itself upon the French Government, who, whilst anxious to relieve the agricultural distress, finds itself hampered at every step by a law which acts as a prohibition to all progress either in the condition of the soil or the proprietors.

THE WANT OF SYSTEM IN THE EDUCATION OF THE FARMER.

Something more than twelvemonths since, when considering the case of the labourer, a society of agriculturists came to the conclusion "that the progress in mechanism, science, and the arts renders an improved judicious education essential to the labourers, while it would be highly advantageous to the farmers." They felt, in fact, their own want; and in saying all they did for their men, could not forbear adding a word for themselves. There was something, as we took it, very suggestive in such a rider, and we are in no way surprised to find the same association now following this meeting up with one more directly addressed to their own case. If progress in mechanism and science necessarily demands a higher tone in the character of our workmen, the same cause must most essentially conduce in a yet greater degree to our own advance in the social scale. Agriculture, indeed, is coming itself to be systematically treated as a science, and it is to the extension of this system we have now to look. The

farmer of modern times must be more methodically prepared for the place he is to fill. There was a day, and not a long distant one either, when it would seem anybody would make a farmer. A lad, whose conduct or wits hardly fitted him for anything "better," was put to it as a ready-made business, in which he could not well go wrong so long as he did just as the people had done there before him.

Strange as it may sound, we have but very little improved upon this. Like the poet or the prophet, the agriculturist is still a heaven-born genius. If he is really well educated, it is as anything but as a farmer; and if indifferently, he is even less prepared for our present reading of what such an occupation should be. The latter is now by far the greater evil of the two. In a past age, it was held to be a very fatal mistake to bring up a boy above his business; and the other extreme was but the too common consequence. If he was not to be "a fine gentleman," he was an

illiterate boor, with scarcely a thought or an aspiration above his own labourers and companions. Fortunately we have outlived such an era; and a good education is no longer considered as being above a tenant's proper station or right. When Mr. Colville pooh-pooed the piano, and wished to return to the golden age of the maid with the milking-pail, he could not find any one to support him. And although it may be politic enough for the master even yet to know how to draw a furrow himself, the interpretation of his duty is susceptible of a far higher reading. "Science, the arts, and mechanics," as they said at the Farmers' Club, have, by this, gradually increasing calls on his attention, and it will be to his best interest not to neglect them.

The important question, after all, is as to when the education of the farmer should or does actually commence? Up to a certain time most lads must receive the same kind of treatment. They learn to read, write, and cipher; and at the meeting the other night there was a pretty general opinion that Latin and Greek could do them no harm. So far, and any boy of the middle or even higher classes in society might be well grounded, without ever touching on the important point of "What he's going to be?" But there is a limit to all this. The soldier goes to Sandhurst or Addiscombe, the merchant as a clerk to London, the divine to the university, and the future farmer to Cirencester or Kennington. If he *does*, he is a grand exception to what has so far been the common course of things. Or, if, as we may assume he does *not*, he leaves Horace and Homer for farm accounts, the rotation of crops, and the diseases of cattle, as he will study them in company with some practical authority of repute. There is more probability of this; but still such an apprenticeship is by no means the common lot. The greater chance is, that he only leaves school "to look about him." If his father should be engaged in rural pursuits, he goes home to assist, and to get that inherent knowledge of the business only to be acquired under such circumstances; that is, by doing very much as he likes. As a principle of education, we should say that young men are generally beyond the beneficial influence of any rule or system when they are thus left to themselves under the family roof. And yet it is in this wise that the majority of our farmers have learnt the rudiments of their profession. While one brother is grinding at the law, and another walking the hospitals, "John" is troubling himself very little about his business, until Maryanne hints that if they are ever going to be married he had better look out for a place of his own. And then the old people start them, and John really begins at last to learn farming in earnest. And much credit to him that he has got on so well as he has done.

Even admitting that a man might and often does acquire a practical knowledge of his profession in this way, there are yet many things that it is almost impossible for him to pick up at home. His education wants "pointing," as it were, for the pursuit for which he is intended; and we must accept it as a very evident truism, that the more one really knows of his business the more likely is he to succeed in it. Now, the development of modern agriculture has made this same "pointing" more and more indispensable. In the days when we all did just as we had done, a lad might perhaps have learned the whole art of farming on the farm itself. But he can scarcely do so now. Science, mechanics, and the arts are by this

part and parcel of his daily avocations; and it is almost as necessary for him to be well grounded in these, as in the mere routine of ploughing, sowing, and reaping. In fact, science and the arts bear directly on these; and the man who has not some proportionate knowledge of their effects works more or less in the dark, as well as at the mercy of many who are sure to play upon his ignorance. What would promise to guard him against the tricks of some of the maure dealers so surely as a personal acquaintance with chemistry? What shall secure for him the best implements but some practice in mechanics? And youth, be it remembered, is the time for learning. Many who had not the opportunity in their younger days have gradually educated themselves in these matters. But self-educated men are ever exceptional; and the farmer who is to have, as he should have, a knowledge of such sciences, should obtain it ere he ventures to report himself up to his business.

There are already, as we have said, establishments especially provided for supplying such information; and others, no doubt, would spring up as more and more use was made of them. The application rests now altogether with the farmers themselves; and those who are content with giving their sons merely a reading and writing education, just fitting them for anything, or rather for nothing, may rest assured that they are not affording their children that fair chance they should have. Mr. Bond, indeed, would go so far as to both test and stimulate the proficiency of our agricultural youth by a system of public examination. Hitherto, all attempts at this have been unmistakable failures. Nor are we very sanguine as to such a means ever meeting with any very general support. There can, of course, be no objection to each separate institution having periodically such an ordeal of its own; but we question very much whether any *number* of young men of "one-and-twenty" would go up for "honours." However, there is a manifest inclination in many places to foster advancement by this or some similar agency. Both the Highland and West of England Societies have for some time been moving in this direction; and Mr. Bond calls directly on our national society also to look to it. Here "lies hid in embryo the Royal Agricultural Society's most successful operations and her proudest triumphs."

Just at this time Mr. Bond is especially emphatic on the improvement and education of our agricultural population. During the same week that he read his paper at the Central Club "On the Education, Discipline, and Introduction of the young Farmer to Life," there was published by the Suffolk Society a prize-essay in his name on "The Elevation, Improvement, and Education of the Labouring Classes." Perhaps, if anything, there were portions of the Club paper which assimilated in style more with what a Discourse might be, than an every-day address of one farmer to his fellows. The essay, however, goes even beyond this. It is filled with references to and quotations from the Scriptures, abounds in exhortations and lamentations, is written up to the precept of "Love the brethren," and concludes with a short prayer. We question the taste or policy of thus continually introducing the most sacred subjects, while we have the highest authorities to support us in saying such a practice is commonly attended with more harm than good. Mr. Bond has already deservedly distinguished himself as a writer and speaker on agricultural topics, and his papers hitherto have struck us as being singularly well composed. But we fear the tone of his more recent efforts will rather tend to defeat his intentions, good as we must allow them to be.

PROGRESS AND IMPORTANCE OF AGRICULTURE:

A LECTURE DELIVERED AT THE BEDFORD WORKING MEN'S INSTITUTE

BY MR. CHARLES HOWARD, OF BIDDENHAM.

Mr. HOWARD said:—Perhaps many of the working men I see before me, upon reading the notice for this lecture, may have asked themselves the question—What have we to do with agriculture? I think very much, and that no class of the community has so deep an interest as the working classes in this subject, for this reason: you spend a larger proportion of your income in the purchase of agricultural products than any other class, and, therefore, to you any improvements or discoveries, by which more produce is raised from the soil, is a question immediately affecting your interests, as it influences the price of the 4lb. loaf and leg of mutton. The farmers are a large class of the community of this country, numbering considerably above a quarter of a million. I am aware you working men have been taught to look upon us as inferior in energy and intelligence to the trading and commercial classes; we have been called chav-bacons, clod-poles, and our heads said to be as thick as the clods we cultivate, and other polite names; and only a few weeks since, the editor of one of our newspapers, and designated in some quarters the leading paper of the county, having occasion to speak of us, described us as leather-headed; but as that gentleman informs me he contemplates some day becoming a farmer, we shall then have a most brilliant exception. I feel it, therefore, a great comfort, having undertaken to deliver this lecture, to know that you will not expect much from one of these clod-poles, and, consequently, none of you will go away disappointed. I admit, farmers, as a class, are neither great talkers nor writers, nor do they study to become so; for it has so often occurred that those who have been either the one or the other have been anything but good or successful farmers. It was so with poor Tusser, who wrote some 250 years ago, and it was said of him:—

“Tusser, they tell me when thou wast alive
Though teaching thrift, thyself couldst never
thrive;
So, like the whetstone, many men are wont
To sharpen others when themselves are blunt.”

My business, to-night, is with the working classes; with others I have nothing to do. Many I see here I know full well do not answer to that description; and, when I tell them this is the first time I have appeared before an audience for such a purpose, I must ask of them—and I am sure they will grant my request—a lenient criticism. I will not weary you with any further apology for my appearance here this evening, but will at once direct your attention to the subject which your worthy Chair-

man and Committee have requested me to bring before your notice, viz., “The Progress and Importance of Agriculture.” “Liebig, one of the most eminent men of modern days, has said that there is no profession which can be compared in importance with that of agriculture, for to it belongs the production of food for man and beast; on it depend the development and welfare of the whole human species, the riches of states and all commerce; and there is no other profession in which the application of correct principles is productive of more beneficial effects, or is of greater and more decided influence. Agriculture was the original occupation of man, and has, throughout all ages, been his chief employment; for ever since the hour when the command was first given to man to till the earth and subdue it, owing to his natural desires and wants it has been a necessity. The first of arts, and now among the noblest of pursuits, it received the earliest attention of mankind; and, from that time to the present, it has been improving, and will, doubtless, go on advancing so long as mankind continues to increase. From all history it will be found that wherever it has been encouraged, cities, republics, and empires have risen into greatness; and where it has been neglected, these mighty states have fallen from their high position.”

From the earliest ages, the cultivation of the soil was man's great delight; and a desire seems to have been implanted in almost every man's breast to be the occupier of a piece of land; for, now-a-days, there are plenty to be found, particularly of a town population, who think their fortunes are made when they commence farming, but how sadly disappointed many of them have been! I admit that the pursuit of agriculture is one of the most healthful and delightful occupations; but I must inform you, it is not the road to wealth; for, while our brethren engaged in commerce and manufactures speedily line their pockets and sumptuously live, we must be content with a slower process of making money, and more humble fare. But we envy not these gentlemen their riches or their luxuries; give us the sweet green fields to roam in, and a happy home, they are welcome to the riches oft-times obtained in a murky office in a crowded thoroughfare.

When Adam was expelled from the garden of Eden, where he had been placed to dress and to keep it, the fiat went forth that by the sweat of his brow should he earn his bread, by tilling the ground from whence he was taken; therefore I may properly call our first parent a farmer; and so soon as his sons were able to work, the one was a tiller of the ground, and the other a keeper of sheep.

The three brothers of the seventh generation from Adam—viz., Jabal, Jubal, and Tubal-Cain—made certain great class improvements, which clearly intimate that one was a systematic stock feeder, and another a maker of agricultural implements. And Lamech, when Noah was born to him, said, "This same shall comfort us concerning our work and toil of our hands, because of the ground which the Lord hath cursed," thus showing that Noah was engaged in the culture of the soil. Agriculture was, however, not much engaged in until after the Deluge, when it formed the principal occupation of Noah and his descendants. Noah took into the ark with him a large knowledge of husbandry; and the practices of his family round the skirts of Ararat were repeated on the Euphrates, and taught throughout all the countries of the dispersion. Abraham, also, belonged to a wealthy pastoral family, and we read of his large possessions of flocks and herds; of his son Isaac sowing in the land of Gerar, and receiving in the same year an hundred fold. The wily Jacob, as he has been often called, was also much engaged in the cares and duties of pastoral life, and exhibited no ordinary knowledge of his calling; for we all know by what cunning device he obtained possession of a large share of the flock of his father-in-law, no doubt thinking, as many do now-a-days, that the rich old Laban ought willingly to have given him a dowry with his daughters. From that incomparable narrative, the history of Joseph, we learn that all the children of Jacob, from their own words to Pharaoh, that their trade had been about cattle from their youth, had desired, when they came into Egypt, that they might settle in the low-lying lands of Goshen, as producing the best pastures for their flocks—displaying no mean judgment in the quality of the soil; and, when they had Pharaoh's permission to locate in this spot, he said to Joseph, "If thou knowest any men of activity amongst them, then make them rulers over my cattle." And that great man who was raised up by God to deliver his people out of the hand of the Egyptians, Moses, also attended for forty years the flocks of Jethro, his father-in-law. Although the farmers of the present day have been called a grumbling, growling, discontented lot, yet it is a comfort to us, as a class, to know that there was one, and only one man, so renowned for his patience, that it has passed into a proverb, and that man was a very large farmer; for we read that the honest, upright, and patient Job, the greatest man of the East, had 14,000 sheep, 6,000 camels, 1,000 yoke of oxen, and 1,000 she asses. There were other large farmers. Elijah found Elisha, the son of Shaphat, ploughing with twelve yoke of oxen, himself being with the twelfth yoke, plainly showing he was not above his business, and setting an example worthy of being more followed by the farmers' sons of the present day. The noble king David, who in his youth was a shepherd boy, no doubt was a skilful husbandman, and saw that his estate was well managed, for we read that on his royal farm he had eleven overseers. The estates, too, were large in those days, both of the kings and their subjects; for we find that Uzziah, king of Judah,

"had much, both in the low countries and in the plains, husbandmen also, and vine-dressers, on the mountains, and in Carmel, for he loved husbandry." I need not further multiply instances that agriculture was the chief employment of these ancient worthies, and we have proof that they excelled in the art. Their implements were light, simple, and rude, yet they were most efficient for the powdery and thirsty soil of Palestine; and a sure evidence of the goodness of their farm practices exists in the abundance of their harvests—no people can be said to have farmed ill, who for years and centuries in succession reaped from thirty to a hundred fold.

Having thus briefly reviewed the Bible history of agriculture, I will now proceed to speak of it as practised by the Greeks and Romans. The Greeks considered it a most important and beneficial art, and paid the greatest attention to its practice; and there was probably not a leader among them who did not assist, with his own hands, in farming operations. Hesiod is the earliest writer who gives us any detail of their management; and from his writings it may be inferred that he understood his subject, for he observes that fallowing or frequent ploughing in spring or summer is of great advantage; and he advises the farmer to be provided with a spare plough, that no accident may interrupt the operation—a piece of advice that our plough makers would not object to see more carried out in the present day. He also directs the ploughman to attend to his employment, to trace the furrows carefully in straight lines, not looking around him, having his mind intent upon what he is doing. Xenophon, who lived three hundred and fifty-nine years B.C., was, however, their great agricultural writer, and in his "Essay" the following interesting narrative occurs: In his time the Greek landed proprietor no longer laboured upon his farm, but had a steward as a general superintendent, and numerous labourers; yet he always advises the master to attend to his own affairs. "My servant," he says, "leads my horse into the fields, and I walk thither for the sake of exercise; and when arrived where my workmen are planting trees, tilling the ground, and the like, I observe how everything is performed, and study whether any of these operations may be improved." After his ride, his servant took his horse, and led him home, "taking with him," he adds, "to my house such things as are wanted; and I walk home, wash my hands, and dine off whatever is prepared for me, moderately." And again, he observes, like a keen, sensible man as he was—and I would have you remark it, those of you who think any man can be a farmer—he says, "No man can be one, till he is taught by experience; observation and instruction may do much, but practice teaches many particulars which no master would ever have thought to remark upon. Also, before we commence the cultivation of the soil, we should notice what crops best flourish upon it, and we may even learn from the weeds it produces what it will best support." This good man would have shone, had he lived at this time, and set a noble example, not only to farmers, but to the class to which he belonged,

viz., the landed proprietors; for it seems he acquainted himself, most thoroughly, with what most concerned him, the good management of his estate. The Greeks, too, had a good knowledge of manures, as much or more than many farmers of the present day. Xenophon recommends green plants to be ploughed in, and even crops to be raised for the purpose, for such enrich the soil as much as dung. Another of their writers, Theophrastus, shows still more knowledge, for he recommends a course that has made the Norfolk farming so eminently successful, viz., the mixture of soils, particularly clay upon sand, stating it as his conviction that this system would produce crops as luxuriant as could be effected by the agency of manures. They also hoed their crops, and kept them free from weeds. One of their writers, referring to the latter, says: "Besides the hindrance they are to corn or other profitable plants, they keep the ground from receiving the benefit of a free exposure to the sun and air." Their land was generally let upon lease, and I will give you a specimen of one dated in the 108th Olympiad, 345 years before the Christian era, and from its brevity and simplicity I should suppose that no lawyer had anything to do with it. It has been often quoted, but it may be new to some present. It is a lease by the Æxonians—the townspeople or demos of Æxone—of a piece of land called the Philais, near Mount Hymettus, to a father and his son for forty years, for 152 drachmas a year.

"The demos of Æxone let on lease the Philais to Autocles, the son of Anteus, and to Anteus the father of Autocles, for forty years, for 152 drachmas a year; the said land to be farmed by them, or planted with trees as they please; the rent to be paid in the month of Hecatombæon. If they do not pay it they forfeit their security and as much of the produce as they stand in arrear. The Æxonians not to sell nor to let the said land to any one else until the forty years have elapsed. In case of a loss on the part of the tenants by hostile invasion, no rent to be paid, but the produce of the land to be divided between the Æxonians and the tenants. The tenants are to deliver up half the land fallow, and all the trees upon the land; for the last five years the Æxonians may appoint a vine dresser. The lease to begin, with respect to the corn land, with Eubulus the Archon entering into office; but with respect to the wood, not before Eubulus goes out of office. The lease, to be cut upon stone, to be set-up by the magistrates—one copy in the temple of Hebe, the other in the Lesche; and boundary stones to be set-up upon the land, not less than two tripods on each side. And if a tax should be paid for the land to Government, the said tax to be paid by the Æxonians, or, if paid by the tenants, to be deducted from the rent. No soil to be carried away by digging of the ground except from one part of the land to another. If any person makes a motion in contravention of this contract, or puts it to the vote, he shall be answerable to the tenants for the damage."

"In this short lease," Mr. Caird observes (from whose work we get it), "there is much of

that plain common sense, which fairly recognises the interest and duties of both parties, and which is so often lost sight of, in the perplexing labyrinth of modern legal phraseology." From these extracts from their writings, and from this lease, I think you will agree with me in saying that the Greeks had a very considerable knowledge of agriculture; but as they became enriched by commerce and manufactures, they neglected what was, and appears always is to be, the least profitable, viz., the cultivation of the soil, and it consequently declined.

The estimation in which agriculture was held by the Romans is pretty generally known; the most illustrious citizens deemed it their most honourable employment. Generals, who put themselves at the head of her armies, pushed her conquests, and carried her eagles round the world, could handle the plough as well as the sword; they retired from the conquest of kingdoms to the management of their farms, and thought themselves fortunate if they were relieved from the services of the State, so as to enjoy the pleasures of rural life.

"In ancient times, the sacred plough employed
The kings and ancient fathers of mankind,
Who held the scale of empire, ruled the storm
Of mighty war; then with victorious hand,
Disdaining little delicacies, seized
The plough, and greatly independent lived."

The writers upon Roman agriculture are numerous, and from them full information is obtained. The illustrious Cato dedicated a volume to his son; Varro composed an agricultural treatise; Virgil immortalized himself in rural verse; Columella and Pliny also wrote largely; and from these we gather that agriculture was well understood, and it has been thought by some writers to be nearly equal to that pursued by the present farmers of England. Cato is reported to have esteemed him the best husbandman who annually procured the most food for cattle. In those days, there were agriculturists very far in advance of their fellows; for Pliny records a story of an industrious and ingenious husbandman, who being in advance of the knowledge of his time, cultivated a small piece of ground upon an improved method, by which he gathered much more fruits, and reaped larger profits than the neighbours about him, though their possessions were more ample. His uncommon success excited their envy, insomuch that they brought this accusation against him—that by sorcery, charms, and witchcraft, he had transported his neighbours' fruits, fertility, and increase, to his own fields. For this, he was ordered peremptorily, by Albinus, a Roman general, skilled in agriculture, to answer the charge before him. Cresinus, fearing the issue, resolved upon his best defence: he brought his plough and other rural implements, and displaying them openly, he set there also his daughter, a lusty strong lass, big of bone; then turning to the citizens, "My masters," quoth he, "these are the sorceries, charms, and all the enchantments that I use. I might also allege my own travail and labour, my early rising and late sitting up, and the painful sweat that I daily endure; but I am not able to present these to your view, nor to bring them with me into this assembly." This bold and open de-

fence captivated the people; it proved the *coup de main* which turned a doubtful result to his entire favour: he was pronounced not guilty, and those present took note of his inventions. During their early history their occupations were small. Cincinnatus, who was summoned from the plough to be dictator, had only four acres. But as the empire extended and its wealth increased, rich individuals were allowed to purchase large estates, and to cultivate them by means of bailiffs and tenants. And we gather from these writers that their management must have been very respectable. They knew well the value of manure, and set many of us an example in storing it, using covered pits for the purpose; they had a knowledge of draining, similar to that practised now, using earthen pipes, stones, and wood; they were very particular as to their ploughing, having it done very straight, and with regular furrows. They had a great variety of ploughs, and, no doubt, these possessed a considerable degree of excellence. According to Pliny, they ploughed in their seed with a double-breasted plough, which is alluded to by Virgil, in his instructions for the manufacture of this implement; I do not know whether my worthy brothers will deem it worth their attention:—

“Formed for the crooked plough, by force subdued,

Bend the tough elm, yet green amid the wood;
Beyond eight feet in length the beam extend;
With double back the pointed share defend;
Double the earth-boards that the glebe divide,
And cast the furrowed ridge on either side;
But, light the polished yoke of linden bough,
And light the beechen staff that turns the plough;
These long suspend where smoke their strength explores,

And seasons into use, and binds their pores.”

Reaping machines were also used by them; and the worthy Scotch pastor, Patrick Bell, who introduced one into Scotland in 1827, doubtless took his idea from the description of the one used by the Romans. They also let the land generally upon lease—a sufficient proof that it was decently managed. Such is a short outline of the agriculture pursued by this mighty people; and it is a startling historical fact, that when this great country neglected it—although great were its conquests—the seeds of its dissolution were sown, for it rapidly declined. And from misrule, and other causes, the agriculture of the south of Europe has relaxed, and remains in what may be termed a barbarous state; for my brother, who visited the Austrian dominions, on business, two years ago, informs me that, in the southern part of Hungary, the only preparation much of the land receives is effected by bushes bound together to form a harrow, which are tied to the tails of Hungarian ponies, and driven rapidly over the land.

There seems every reason to believe that Britain owed its first lessons in agriculture, as an art, to the Romans, and Agricola was the chief instrument. The native Britons used but a small portion of the land for raising corn or other cultivated vegetables, and the rest of the country was left entirely open, affording a common pasturage for their cattle: the greatest

proportion of the country was occupied by heaths, woods, and other unreclaimed wastes—the woods supplying a great deal of food, as beech nuts and acorns, for large numbers of swine. But during the Roman sway, agriculture rapidly improved, so much so that very considerable quantities of grain were exported from this country. The Emperor Julian at one time sent a fleet of 600 vessels to convey away the corn he had exacted from the natives; and these vessels have been supposed capable of exporting 120,000 quarters of corn—convincing proof that a country that could bear so large a drain on its produce must have made some rapid strides in its cultivation. With this great improvement in the country, it was successively subdued by the Saxons and the Danes; but, as these came to improve their fortunes, and to win the comforts of life, agriculture continued to flourish. The division of landed property into inlands and outlands originated with the Saxon princes, who gave to their followers whatever districts they pleased, as rewards for assistance in the conquest, reserving to themselves certain portions, and imposing certain burdens upon each estate granted. These proprietors let their farms, and the rent was settled by law. For, according to the laws of King Ina, the rent of a farm consisting of ten hides, equal to about 1,200 acres, was 10 casks of honey, 300 loaves of bread, 12 casks of strong ale, 30 casks of small ale, 2 oxen, 10 wethers, 10 geese, 20 hens, 10 cheeses, 1 cask of butter, 5 salmon, 20lb. of forage, and 100 eels; a very moderate rent we should consider in these days, and one that would scarcely call for any grumbling. “The introduction, however, of the feudal system by the Norman conquest brought in unsettled times, and the proud and ambitious barons, being more intent on distinction in a rude and cruel warfare, regarded with contempt a pursuit which accorded so little with their tastes, and which was rendered insecure by the internal feuds to which their more ignoble exercises gave rise. Hence, agriculture rapidly declined. A feudal system has been rightly designated the encampment of a great army; and though the possession of the land was the remuneration which the soldier received for his services, that possession was granted during pleasure, and so long only as the vassal could render sufficient military aid. To afford this service, he was subject to be called away from the fields at the most important seasons, his superior being anxious only for military distinction, and so far from patronizing, had no sympathy in the degraded occupation of husbandry.”* The enclosure of land was carried out on a small scale on the early Saxon estates; but it was not until the reign of Henry III. that it received more attention; and this was caused by the improvement in the demand for the broad-cloths manufactured in this country. The landed proprietors then saw that it would be to their interest to enclose their manorial wastes, in which to feed sheep themselves, or to let out as pasture farms. Some writers, however, think that we are indebted to the

* Dudgeon's Agriculture of Scotland, Roy. Ag. Jour., vol. 1.

Normans for introducing an improved system of cultivation. Thousands of husbandmen, from the fertile plains of Flanders and Normandy, came and settled in this country, and introduced a course of husbandry similar to that pursued in their own country. The clergy, and especially the monks, during these unsettled times, were, in consequence of their sacred avocation, left undisturbed, and bestowed considerable attention to the cultivation of the soil.

In the fourteenth century we find Edward III. gradually abolishing slavery—yes, slavery; for, up to this time, the peasantry of England were slaves, bought and sold with an estate; and it was not until the Reformation that they entirely rose out of their degraded position, and those emancipated applied themselves to husbandry as well as trade and manufactures. England at this time imported corn; for, in consequence of the quality and quantity of wool that was grown here, a large exportation was done in the article by many of the bishops and abbots, who were allowed to engage in mercantile pursuits; their trading vessels, in which they sent their wool to foreign markets, bringing in return large quantities of corn. During the fifteenth century England was engaged in civil wars between the houses of York and Lancaster, and such multitudes of labourers fell in battle, that there remained not sufficient to cultivate the soil, so that a great deal returned to pasture. In the reign of Henry VII., a law was passed by which the large estates of the barons might be subdivided and sold, so that rich commoners could become landed proprietors; and from this, originated that highly respected class—the country gentlemen of England; and, from the accession of this monarch to the throne, cultivation began to pour upon the kingdom its numerous advantages—the culture of hops was introduced, and the breeding of horses encouraged. After the beginning of the sixteenth century, agriculture partook of the general improvement consequent upon the invention of printing: the first book upon the subject was written by one Sir Anthony Fitzherbert, a Judge of the Common Pleas, in the reign of Henry VIII., in which he describes the advantage of quick-setting, hedging, and ditching: he also lays down a line of conduct for a young gentleman to thrive; and also points out the duties of a farmer's wife; and, if I may judge from the number and character of these, she must have had no easy time of it. In the reign of Edward VI., the great demand for our woollen manufactures increased, so that a great portion of the land that formerly had been cultivated was now converted into pasture, for they considered it more profitable to feed sheep and cattle than to grow corn; hence numbers of labourers were thrown out of employment; rents were enormously raised, and the corn farmers ruined: these men had their friends, who raised their voices in their behalf; for we read of Bishop Latimer preaching before the king and pleading their cause: "Let them," referring to the farmers, "have sufficient to maintain them and find them in necessities: a plough land must have sheep to dress the ground for bearing corn; they must have swine for their food to make their

bacon of—their bacon is their venison, it is their necessary food to feed on, which they must not lack; they must have other cattle, as horses, to draw their ploughs, and the carriage of things to market, and kine for their milk and cheese, which they must live upon and pay their rents." However this state of things did not last long; for as the growth of wool increased in other countries, the production of it in England diminished, and, as corn was scarce and dear, its growth was rendered more lucrative, and land gradually returned into cultivation. The condition of the yeoman at this time was of a very humble character; their farms were small, for we find one of the most respectable yeomen of his time did not occupy more than 100 acres. Bishop Latimer, speaking of his father, says, "My father was a yeoman, and had no lands of his own; he had only a farm of three or four pounds, by the year, at the utmost; and hereupon he tilled as much as kept half-a-dozen men: he had a walk for a hundred sheep; and my mother milked thirty kine." This good man must have been a successful manager, for out of this little farm he kept his son at school till he went to the university, and maintained him there; he married his daughters with five pounds, or twenty nobles, each; he kept hospitality with his neighbours, and some alms he gave to the poor: from this account it is quite certain Mr. Latimer was no disgrace to his class. Agricultural writers now became numerous. Tusser, called by some the British Varro, flourished in the reign of Elizabeth, and wrote his "Five Hundred Points of Husbandry," in doggerel rhyme, in the year 1580, a specimen of which I will give you. He divides the gross produce of the land into ten purposes:—

"One part cast forth for rent due out of hand,
 One other part for seed to sow thy land;
 Another part leave parson for his tithe,
 Another part for harvest, sickle, and scythe;
 One part for plough-wright, cart-wright, knock-
 er, and smith,
 One part to uphold thy teams that draw there-
 with;
 One part for servant and workman's wages lay,
 One part likewise, for fill-belly, day by day;
 One part thy wife for needful things doth crave,
 Thyself and child the last one part would have.

Who minds to quote, upon this note,
 May easily find enow;
 What charge and pain to little gain
 Doth follow toiling plough.

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

Poor Tusser's notions of apportioning one-tenth part of the produce for rent would not suit the landlords of the present day. Sir Hugh Platt also wrote a work upon the "New and Admirable Art of Setting Corn," published in 1601, by Peter Shorte, dwelling at the sign of the "Starne" on Breadstreet Hill. He had a knowledge of the value of artificial manures; for he says, "Shavings of horn, upon mine own experience, I must of necessity

commend, by means whereof I obtained a more flourishing garden at Bishop's Hall, in a most barren and unfruitful plot of ground which none of my predecessors could ever grace or beautify either with knots or flowers. I have had good experience, with singular good success, by strewing the waste soap ashes upon a border of summer barley; malt dust may here also challenge his place, for four or five quarters thereof are sufficient for an acre of ground; and sal-ammoniac, being a volatile salt, first incorporated and rotted in common earth, is thought to be a rich mould to plant or set in. Dogs and cats and other beasts, and generally all carrion, buried under the roots of trees, in due time will make them flourish and bring forth in great abundance."

Up to this time wheaten flour was a comparative luxury, being served only at the master's table; and we gather from Tusser that wheat was only partially grown, for he writes—

"In Suffolk again, whereas wheat never grew,
Good husbandry used, good wheat land I knew."

And an old writer of this time, the Rev. W. Harrison, adds that labourers and artisans were driven to content themselves with horse corn, beans, peas, oats, fares, and lentils; and the same writer, describing the manners in Elizabeth's time, states, "There were few chimneys even in capital towns: the fire was laid to the wall, and the smoke issued out of the roof, or door, or window. The houses were built of clay, and all the furniture and utensils of wood. The people slept on straw pallets, with a log of wood for their pillow: the filthiness of their habitations and the slovenliness of their persons abridged the duration of human life."

The civil war against Charles I. proved another disastrous period for agriculture. The farmers' produce was cut before it was ripe: his sheep, cattle, and corn, were stolen by the contending forces; and he, poor fellow, very often crucified between two sets of thieves. With such a state of things, no wonder that farming languished, for men were not inclined, even if they had the knowledge, to do much to enrich the soil.

The agricultural writer of this reign was one Gabriel Plattes, who has the credit of introducing the first drilling machine; he, poor man, like many more, had laboured for the benefit of others, so that he became destitute of the necessaries of life, and fell down in the streets of London, and died of hunger.

Oliver Cromwell bestowed some little favour upon agriculture, for he pensioned Hartlib, the agricultural writer of that day; he was, however, forgotten at the Restoration, and he, too, it is believed, died in great poverty.

Towards the close of the seventeenth century important improvements were introduced, particularly the cultivation of clover and turnips; these had long been known, but not cultivated in the field, and then only on a very limited scale. The first notice we have of feeding off turnips is in 1654, when it was observed that sheep fattened very well upon them. And that invaluable root, the potato, which has afforded so much comfort,

and, in importance, comes next to bread to the working man, although introduced by Sir Walter Raleigh in 1586, was not generally cultivated until the close of this century.

"It was not, then, until the establishment of complete order, some time subsequent to the Revolution, that there appears to have been any material improvement in the ordinary practice of husbandry; though, no doubt, the extent of land devoted to agriculture must, from the growing amount of the exportation of corn during the early part of the eighteenth century, have been considerably increased, and, in consequence of the comparative prevalence of domestic quiet, many landholders turned their attention to a subject that was so closely allied with their welfare."* And agricultural societies were formed, and our Scottish brethren led the van in this particular, for in 1723 one was formed, designated the "Society of Improvers in the Knowledge of Agriculture in Scotland." And about this time in England, noblemen were found who took a lively interest in this subject. Lord Townsend, on retiring from political life, "and which," says a writer, "went on none the worse without him," spent eight years of his life in improving his estate: to him we owe the introduction, on a large scale, of turnip husbandry; for this, he met with great prejudice and ridicule, and was called "Turnip Townsend." He surmounted these, for he had sagacity to see that this crop was the foundation for all future crops; and, from its introduction, land that was not worth previously 2s. 6d. an acre, now readily lets for 30s. This nobleman was ably supported in all his efforts for the improvement of the land by Jethro Tull, who flourished at this time, viz., in 1730, and who conceived the idea of drilling crops in rows at wide intervals, and also introduced horse-hoe husbandry; and it has been observed by his biographer that his system completely revolutionized the whole practice of husbandry; and that his name will ever descend to posterity as one of the greatest luminaries, if not one of the greatest benefactors that British agriculture has the pride to acknowledge. This last improvement was peculiar only to Norfolk, no other part of the country having to any extent adopted it. And about this time that system was introduced which has so eminently raised the farming of England—I allude to the four-course, that is: 1st, turnips; 2nd, barley; 3rd, clover; 4th, wheat. The Norfolk cultivators were never tempted to take two corn crops in succession; they had learnt the importance of alternating grain with other crops. They soon found the advantage of barley following turnips; the clover the barley; and wheat the clover. These changes were wrought from 1730 to 1760; "and the next step," says Mr. Sidney, "was to break down the barriers which separated the farmers of that day, and which left them nearly as ignorant of what was going on in every district besides their own, as of what was passing in China or Japan. The active agent in this good work was Arthur Young, the son of a clergyman in Suffolk; he appears to have been one of those who could write

* Dudgeon Roy. Ag. Soc. Jour, vol. i.

and talk better than he could farm; for early in life he took an occupation of three hundred acres, but, not being successful, he gave one hundred pounds to be released from it, and on the same farm the new tenant did exceedingly well. Having abandoned farming, he made those agricultural tours for which his name will be handed down to posterity as a most useful and sagacious man. In his time the most advanced counties communicated with the metropolis and each other by thoroughfares which could hardly be traversed except by a well-mounted horseman, or a broad-wheeled waggon drawn by twelve horses; while, as not one farmer in a thousand read anything at all, the printing press could not supply the place of personal inspection."

"Norfolk, with a subsoil which allowed the rain to filter through, boasted her natural roads; and the inhabitants quoted with pride a saying of Charles II., that the county ought to be cut up to make highways for the rest of the kingdom. In Essex, Young also found the lanes so narrow that not a mouse could pass a carriage; ruts of an incredible depth, and chalk waggons stuck fast, till a line of them were in the same predicament, and it required twenty or thirty horses to be tacked to each to draw them out one by one. In attempting to traverse these lanes, he had frequently to alight from his chaise and get the rustics to assist him in lifting it over the hedge. "Such," writes Mr. Sidney, "was the state of things when, in 1767, Young abandoned the farm on which he had experimented too much to be successful, and, availing himself of the frank hospitality which has in every age been the characteristic of our farmers and country gentlemen, made those celebrated tours which are absolute photographs of agricultural England. In his reports, he makes known the merits of Robert Bakewell, of Dishley, to whom we owe the introduction of the breed of sheep known as the Leicester, and who realized extraordinary prices for them—three sheep in one season having been let for twelve hundred guineas; and describing the way in which he lived, it is said the yeoman farmers had not yet removed to a parlour, and Bakewell sat in the huge chimney corner of a long kitchen, hung round with the dried joints of his finest oxen, preserved as specimens of proportion—a tall, stout, broad-shouldered man, with brown red complexion, clad in a brown loose coat, and scarlet waistcoat, leather breeches and top boots. There he entertained Russian princes, French and German royal dukes, British peers and farmers, and sight-seers of every degree. Whoever were his guests, they were all obliged to conform to his rules—breakfast at eight; dinner at one; supper at nine; bed at eleven; and at half-past ten o'clock, whoever would be there, he knocked out his last pipe."

A new era now began to dawn upon agriculture; it became a fashionable employment; for King George III. was very devoted to the pursuit, and did much to recommend it to others: he had a practical knowledge of the science, and contributed letters to Young's monthly periodical—*The*

Annals of Agriculture. And he was often fondly spoken of as "Farmer George;" and it is a source of great gratification and pride for us, as Bedfordshire men, to know that this country owes so much to an ancestor of a noble family, standing at the head of our county, for the exertions he made in the cause of agriculture—I allude to Francis, Duke of Bedford, whose example has had a marked and permanent influence, not only upon the farming of this country, but I may say of the whole world, and who was for many years its eminent leader. He established those sheep-shearings that have given a world-wide fame to Woburn; and it may be new to many of you, but at which royal princes, dukes, and peers met and discussed with farmers the mode in which sheep and cattle could be most economically fed, and the best means to be adopted to bring about an increased production of our corn and root crops. This nobleman, with some few others, established the Smithfield Club for exhibiting fat stock at Christmas. Perhaps there are many present who have not witnessed this great sight; if so, they would do well to visit it, for then would they see the noblest animals and finest stock this country produces. This society has been of essential service, by making known the best kinds of food by which animals can be fed, and also imparting a knowledge to the farmer of the best form of animal. The Duke of Bedford was aided in his great work by Mr Coke of Holkham, afterwards Lord Leicester, who came into possession of an estate in West Norfolk, and described as consisting partly of swamp and partly blowing sand, with here and there patches of cultivation, where little was heard but the wild sea-birds' cries, or felt save the oft-returning alternations of the ague, burning or freezing its unfortunate victims. There was many a broad acre in its primitive state of sheep-walk; and, in describing some portions of his property, Mr. Coke made the remark that he found two rabbits quarrelling for one blade of grass. Such was the condition of this estate when this great man came into possession of it; but a speedy reformation was effected. He spent above £400,000 in dwellings and offices; laid out large farms with mansion-like houses, to induce men of capital and intelligence to take them; granted long leases, the covenants of which were drawn by one of his tenants—a proof they were liberal, and only restrained them from taking two white straw crops. By taking this course, Mr. Coke was well rewarded, for it is supposed the tenantry have also laid out another £400,000, and his rental was raised to more thousands than it was hundreds a year. This estate contains about 30,000 acres, and is now computed to be worth £1,200,000; but when Mr. Coke first inherited it, in 1776, its outside value was £300,000. It was then in the occupation of small farmers, who paid their rents very badly, although these were very low, and ultimately a great many of them abandoned them altogether, because they could no longer gain a livelihood. Mr. Coke decided upon farming a portion himself, and had in hand 1800 acres, upon which he tried experiments for the benefit of his tenantry. He introduced a better description of sheep, and

* S. Sidney, Quarterly Review.

showed great judgment in the selection of his flock. Young says, "I have seen him and the late Duke of Bedford put on a shepherd's smock, work all day, and not quit the business till darkness forced them to dinner." Mr. Coke had sagacity enough to know that by taking this course, the labouring classes, the tradesmen, and the surrounding population, would be better off when the land was occupied by men of sufficient capital and intelligence to take large farms, than under farmers but a remove or two from their peasantry. It is a great mistake with many labouring men, and others who ought to know better, to suppose that a county or a country is more prosperous, and will support a larger population in small farms than in large. I am acquainted with various parts of the country, and I speak without fear of contradiction, when I say that in those parts of the country where a moderate number of large farms exist, the population is invariably better off. I say a moderate number of large farms, because I think it would be a bad day for this country when *all* small farms were abolished, inasmuch as they enable many a worthy man to climb the hill of life, and settle his family in a respectable position; but with all small farms the onward march of agricultural improvement would be arrested. Those persons who are so anxious to see England parcelled out into small farms—and I know there are many who do, and who would rather see a farmer wearing a smock frock and riding to market in his dung cart; they are, however, no well-wishers to their country, and whose frame of mind I do not envy them—I should advise to read a Frenchman's * work upon the Rural Economy of England. In this he will find that France, with her small farms, and with double the acreage, is equalled by the United Kingdom in her productions. England herself stands out much more prominently; I will quote his words: "The animal produce alone of an English farm is equal to at least the total produce of a French farm of equal area, all the vegetable production being additional." Notwithstanding the improvements that had taken place on particular estates, the condition of English farming at the close of the eighteenth century very much resembled that of the Continent at the present day. Wheat in many districts was rarely grown and rarely eaten by the labouring classes. Rye, oats, and barley were the prevailing crops. Turnips were confined to a few counties. The general system was two white straw crops and a fallow: straw, wetted by the rains of Heaven, was their only manure. Their cattle were large, ill shaped, ungrateful animals, for they put on their bones very little flesh for the enormous quantity of food they consumed. "Fresh meat," says Mr. Sidney, "for six months in the year was a luxury only enjoyed by the wealthiest personages. Within the recollection of many now living, first-class farmers in Herefordshire salted down an old cow in the autumn, which, with slitches of fat bacon, supplied their families with meat until the spring." Esquire Bedel Gunning, in his Memorials of Cambridge, relates that when Dr. Makepeace Thackeray settled

* Lavergne.

in Chester, about the beginning of the present century, he presented one of his tenants with a bull-calf of a superior breed; on his enquiring after it in the following spring, the farmer gratefully replied—"Sir, he was a noble animal, we killed him at Christmas, and have lived upon him ever since."

Having alluded to the improvements that have been made in Norfolk, it is but natural I should refer to that county in which it is yours and my pleasure to live. It is said by an eminent writer that the agricultural amelioration of Bedfordshire has been no less complete and rapid than that of Norfolk. Less than a century ago three-fourths of the county consisted of nothing but waste commons: these unproductive lands have been gradually divided, enclosed, drained, and cultivated, and, owing to the four-course system, now rank equal to the full average of English lands. "As in Norfolk," this writer continues, "we here also find an influential and energetic promoter of the revolution—the Duke of Bedford." And, on referring to my friend Mr. Bennett's prize report of the farming of Bedfordshire, I find that in 1794 much of the arable land was in an open-field state, and, whether it was found in arable or pasture, it had been evidently ridged up for a series of years, till the tops of the ridges, for six or eight feet across, were the only profitable parts of the soil; and the land adjacent formed so many pools, ditches, and reservoirs of water. The mischievous effects of this wretched system of farming were not confined to the growth of corn, but the destruction of sheep and cattle depastured thereon was too frequently produced, not merely by the rot of a single flock, but occasionally of nearly the entire sheep of a village and neighbourhood. And while upon this subject, I will relate to you an anecdote bearing upon this matter. The late celebrated Mr. Roscoe some years ago undertook to bring into cultivation Chat Moss, part of which the railroad from Manchester to Liverpool now passes over. After about two years' occupation, Mr. Coke went with Mr. Roscoe to see how he was cultivating and improving the land. After a long morning's exercise, Mr. Roscoe told his bailiff they wanted something to eat, and asked him what he could give them. The bailiff said there was a small leg of mutton then roasting for his dinner, and it was quite ready if they wished to have it; soon it was on the table and both partaking of it. After eating a little, Mr. Coke said, "Friend Roscoe, I cannot compliment you upon the quality of your mutton." Mr. Roscoe asked the bailiff what mutton it was. "Some of the Southdown," he replied. "Some of the Southdown!" said Mr. Roscoe; "I did not mean to have any of them killed." "I know, sir, you did not," said the bailiff; "but most of them were so rotten that if I did not kill them they would soon die." Down dropped the knives and forks, and the lunch was made up of bread and cheese. And here I would just make a remark to you working men: it is not the lowest-priced meat that is the cheapest; we as farmers know what often goes into the market, and to use an old and rather vulgar expression—it may be cheap and nasty. My advice to you is to buy meat of the best quality, for half-a-pound of good

meat goes further and is more nutritious than a pound of inferior stuff.

With such pioneers as the Duke of Bedford and Lord Leicester, agriculture rapidly advanced. I find during the first twenty years of the present century an increase in the cultivated land of this country of upwards of three million acres. Turnips were now regularly cultivated; and in 1824, that system was adopted which has been the means of enriching England to a very large extent: I allude to the method of fattening of sheep by slicing turnips and feeding them with oilcake. This was suggested by the very able steward of Lord Leicester, Mr. Blakie, to Mr. John Hudson, now of Castle-acre; and such was his success that when Lord Leicester asked to see the produce of one of his sheep, he found they had been sent fat to market some twelve months before the usual time. Sheep had been generally kept till they were three or four years old; but with the new method of feeding, combined with an improved breed having a greater disposition to fatten, very few are now kept beyond fourteen or fifteen months old; thus the amount of mutton annually sent into our markets has enormously increased; and, had it not been for the improvements I have indicated, and with our growing population, the price of your necks and shoulders of mutton would have been double to what it is at the present day. The Woburn and Holkham sheep-shearings, introduced by those illustrious worthies before named, were the means of bringing into existence a whole number of county agricultural societies; and first among the number is that of our small county, which was established in 1801. From these sprung that famous association—the Royal Agricultural Society of England; and from its introduction another starting point may be dated; and I shall now proceed to speak of the agriculture of the present day. From small beginnings the Royal Agricultural Society has grown to a gigantic size, and its influence upon the farming of the country has been of the most startling character; our stock of all descriptions has become materially improved: the manufacture of agricultural machinery has attained an unheard-of growth, and has acquired a character and excellence which fairly entitle it to rank with the leading branches of our national industry. The hands employed are numbered by thousands if not tens of thousands; and the capital which gives steady employment to these hands is estimated by millions sterling. I think there can be no more convincing proof than this of the spirit of improvement which is now abroad amongst the agriculturists of the present day. At the first meeting at Oxford there were only twenty-two entries of implements; but, after the Cambridge meeting in 1840, the importance of this branch of the show was acknowledged, and the number has increased each year until it reached its highest point at Gloucester in 1853, when 2032 were exhibited. The number of people who visit the show yard is enormous; at Salisbury, in 1857, where the population is only 10,000, the visitors numbered 35,000; and at the Chester Meeting, in July last, they very far exceeded that number. Railways have doubtless been the means of further-

ing agricultural progress. Very significant were the facts given at the Chelmsford meeting by the chairman of the Eastern Counties Railway, when he stated that in the preceding twelve months the lines over which he presided had conveyed 23,500 tons of guano and other artificial manures; 721,000 qrs. of grain; 559,000 sacks of flour; 71,000 beasts; 380,000 sheep and other cattle; 13,750 tons of meat and poultry; 21,671 tons of vegetables; and 4,500,000 quarts of milk. Other improvements have taken place since the introduction of the Royal Agricultural Society. First among the number is that of draining: of course it had been carried out from the earliest times; but not until this period had it been reduced to scientific principles. In 1843, at the Derby Meeting, Mr. John Reed, a gardener by trade, the inventor of the stomach pump and the well-known subsoil plough, exhibited the first *pipe* tile, for which he received a medal; and so much was it thought of, that a prize was offered the following year for a machine by which they could be made; but this was not gained until 1845. Draining now was rapidly forwarded. Sir Robert Peel, who saw the advantage of it on his own estate, passed an act in 1846, by which four millions sterling were appropriated towards assisting landowners with loans for draining their land. This sum was, however, small compared to that furnished from private sources for the carrying out of this great improvement; and thus what the sheep-folding turnip-husbandry had done for the light lands of the country, draining did for the strong tenacious clays; and it has been supposed that the number of miles of drains cut within the last twenty years may be calculated by millions. The Royal Agricultural Society too, by its Journal, had an important share in the introduction of artificial manures: guano was introduced in 1836, but it was some years before its value was known; and it was not until 1840 that a whole host of manufacturers of manures sprung up; and the trade that is now done and the money expended are almost incredible: some farmers are to be found who pay more to the manure merchant than to their landlord. Some of these manures have been of immense advantage upon our light turnip soils, particularly those of the Norfolk plains, and upon the heaths and wolds of Lincolnshire, where it has been said they turned rabbit-warrens and fox-coverts into fields of golden grain. Modern agriculture has derived an incalculable advantage from the appliances of machinery; and the improvement in this branch of our industry commenced when a great deal of the poor pastures were broken up and waste lands were reclaimed, between the years 1816 and 1836. It was during this period that the horse-power thrashing machine was introduced, when labourers thought their doom was sealed; and such consternation did it create among them, that bodies of men went from village to village demolishing these implements. The country was in a most excited state; special constables were sworn in; and I have on my farm a legacy left me by my predecessor—a whole lot of staves, that were manufactured for the use of these said constables in these troublous times. But what a change has come over the views of these worthy sons of toil! The thrashing machine is

looked upon by most of them with a friendly eye; for they would rather do anything now than swing a flail. This laborious work, that cost them formerly so much of their muscle and sinew, is now principally performed by the mighty agency of steam: this power applied to the operations of the farm is the grand advancement of the present day, and is a boon conferred upon the millions of this great country; for without its aid the corn could not be brought into the market to supply your daily wants. Machinery raises the intelligence of the farm labourers. I cannot imagine anything more deadening to the intellect than the constant thump, thump, of the thrasher. Let the same man have charge of one of our ingenious steam-thrashing machines: how his mind must become expanded, in spite of surrounding circumstances! And that working man is blind to his own interest who sets his face against the introduction of machinery; for I can see therein most plainly an agency for raising his social position. The reaping machine is destined to become an indispensable implement: we, as farmers, can no longer depend upon those itinerant bands of reapers (fortunately for them and the country) that a few years ago assisted us to cut down our golden crops; nor is it at all likely we shall ever see again, or perhaps for some years, such a redundancy of labour; for, with our vast Indian Empire to watch over, and large standing armies being the order of the day on the Continent, our villages will, I fear, be thinned of their youths by the recruiting sergeant. The opposition to this implement is not with the labourer, but I am sorry to say with a widely-different class, for some landlords have objected to its use, fearing their shooting might be damaged—in my opinion a mistaken notion, and a very short-sighted policy. Are there no ardent sportsmen in the counties of Lincoln and Norfolk? Is not my Lord Leicester, of whose estate I have said so much, as fond of his gun as most noblemen? And yet in these counties, and on his Lordship's estate, the sickle is scarcely known, the reaping machine and the scythe cutting down all the wheat. But in this county, on more than one large estate, it is a forbidden implement. With some of these proprietors I am most surprised, for they have for many years past wished the people to believe them to be the champions of civil liberty; and yet their tenants are not to exercise their right in cutting their corn in the manner that suits them best. But I must inform these gentlemen that, with open competition with all the world, with increased rents, dear labour, and cheap produce, the farmer must, if he is to carry on his business successfully, avail himself of the best appliances for getting in his crops; but I have confidence in the good sense of landlords generally that they will not, when the matter is properly represented to them, however it might interfere with some little personal gratification, oppose any improvement that is for the welfare of the bread-consumers of this our highly-favoured land. You will expect me to refer to what is now making so much noise in the agricultural world, and I will do so only for a few moments—steam cultivation. Many of you working men, I doubt not, saw one of these inventions in operation on my farm at Bedford some few weeks since. Several minds have had their attention

turned to this subject, and an immense sum has been spent, one farmer alone having already expended £5,000 in his efforts to bring this to a successful issue. Its sanguine promoters state that it will revolutionize agriculture, and that it will reduce the number of our horses to one-half; and some even go so far as to say that by its means they hope to remove the curse. I cannot go quite so far as these gentlemen; I have no doubt it will be of immense advantage upon the cold heavy clay soils of this country: it will be a powerful auxiliary in the operations of the farm, and will bring about an improved system of cultivation. There is every credit due to these enterprising men; and the country will owe them a deep debt of gratitude; but, with all the advantages it may bring, it will not enable us to do with half our number of horses; nor will it, I fear, prevent some of us from still growing our twitch and our thistles.

I have thus given you, very imperfectly I fear, an account of the progress of agriculture in this country. You will perhaps ask yourselves, How has this been brought about? My answer will be, Certainly not by any state patronage, for, unlike our neighbours the French, we have no kindly aid, no fostering care from government; we have no minister, no board devoted to its interest; but by the skill, energy, and capital of the British farmer, encouraged, as he has been in numerous instances, by the liberality and co-operation of some of our large landed proprietors. Unlike our manufacturers, who when anything new strikes them secure it by patent, the farmer, when he discovers any method by which he can raise more corn, or by which he can produce more meat, communicates it at the market table, or through the press, for the benefit of the whole community. I know we have been indifferently thought of; we have had hard things said of us; but I have said, and I say it again, that there is no class to whom this country is more indebted, for we all strive with a friendly rivalry to increase the quality and quantity of our products, so that the people of this country may be fed at the lowest remunerative price. The agriculture of this country may well be said to be the boast of the nation, and the admiration of the world. "We may," said an eloquent foreigner, "rival you in arms, in sciences, in arts and manufacture; but your agriculture is unrivalled, and, with a people so enlightened and free, must remain so until the end of time." But still, with all the improvement that has taken place, much more remains to be accomplished. We have twelve and a-half million acres of improvable, yet uncultivated, land; and much of that which is now under the plough is very wretchedly managed, and will remain so until some better security is given to the farmer for investing his capital. A man under a shifty landlord, and I am sorry to say there are many of this description, does not consider it prudent to spend large sums in improving an estate where he has only a yearly tenure. Well would it be for this country if all its land was in the hands of such noblemen as Bedfordshire can boast of; then should we require but little, if any, foreign supplies.

The undue preservation of ground game is another great barrier to good farming; on many estates great mischief is done. This is not so much the

case where landlords keep the shooting in their own hands; but where the custom prevails of letting the manor, the person who takes it of course feels no interest in the tenant, having no rent to expect of him. Such preservation spoils the temper, cripples the energy, and destroys the produce of the farmer, demoralizes in many instances the labourer, and increases the price of the working man's loaf; but, in justice to the aristocracy, I am bound to say there are many among them (and it would be well if more followed the same course), where they cannot conveniently let the shooting to their tenants, who give them the privilege to course the hares. Amongst the number is his Grace the Duke of Bedford, who worthily follows in the track of his noble ancestry, by doing all he can to promote the best interests of British agriculture.

A few words before I close, upon a subject that is now exciting so much attention—the welfare of the agricultural labourer. It is from this, I fear, in some instances, deeply-injured class, those brave men are found who fight our battles both by sea and land, and by whose daily toil we receive the comforts of life. Too much cannot be done for his amelioration. Education is said by some to be the remedy for all his ills; but, much as I value it, that alone will not do. I often wish I could see as much zeal displayed for the welfare of the labourer, before he commits crime, as we do, in many instances, after he has fallen. We have our reformatories, and our model prisons for his reception; but where are the well-ventilated comfortable cottages for him to inhabit, in which he and his family might take a pride, so that the attractions of the beer-shop would no longer be a snare to him? I admit many landlords are alive to the importance of this; and we have noble examples in our small county, but they are exceptions. The cottages generally throughout our land are a disgrace to it; they possess but one or two bedrooms, consequently there is an indiscriminate huddling together of the sexes. What then can be expected of our rural population but that their morality must be at a very low ebb? There are large numbers of families in this county who are not half so comfortably housed as the pigs and bullocks upon many farm homesteads it is my pleasure to know. With such close, ill-ventilated, miserable dwellings, the labourer too frequently, amid his other privations, has to contend with sickness and disease—fever generally being his visitor. On many estates, too, there is not sufficient cottage accommodation, and the poor man, if he marries, and marry he will, and has a right to do at a suit-

able age, must go to the nearest town for a residence, and slave backwards and forwards a distance of many miles to his daily toil. Then let those who have influence be up and doing; let the country gentlemen of England resist the entreaties of their keepers to preserve large numbers of hares, for it leads to poaching, and this has been the first step in the downward course of many a labourer; it is very little use expressing sympathy for him on the one hand, and on the other setting a bait to ensnare him, and which I contend is the case when these animals are allowed to run about in large numbers: let them also prevent the increase of beer shops upon their estates; for I hesitate not to say, on account of their number, they are the curse of our rural population. I make no allusion here to our old respectable public houses; for, holding the views I do as to the necessity of beer to the working man, there ought to be one of these in every village, for the accommodation of the labourer and his family. Let them also see that he is supplied with his allotment garden, on which he may profitably spend his spare hours: and, above all, let them inspect and take the same interest in their cottages as they do in the prisons and other public institutions of our country, for which they deserve our best thanks. If all these matters be attended to, they will have fewer cases on which to adjudicate in their capacity as county magistrates.

I have no wish to shift responsibility on to other shoulders; to us, as employers of upwards of 800,000 agricultural families, a very great one is attached. We can do very much in raising the social condition of the labourer by assisting the clergymen of our parishes in their endeavours to form village libraries, and evening schools in the winter months for those of our boys who go to work during the day. Let not our interest in the labourer cease when we pay him at the week's end, but induce him, both by precept and example, to attend some place of worship on the Sunday. Let us, as far as practicable, employ no boys on that day, but see they regularly attend the Sunday school; and then all parties uniting—landlord, clergy, and tenant, and using their best exertions, I am quite sure the condition of our labourers will become very much improved, and in the words of the song I will conclude—

“And here's to those whose labour planned

The all which life endears:

God bless the English peasantry,

And grant them happy years.”

VARIETIES OF CATTLE FOOD.

If the Englishman of the present day is better fed than his ancestors, or than the native of any other country, the same improvement is also extended to his domestic stock; for the wisdom and economy of good nutritious food for laying on fat and flesh are now thoroughly understood. Our cattle and horse kind are not left, as in some countries, to collect a scanty provender

from rank grasses in steppes, savannahs, or prairies; to munch upon the sprouts or twigs of trees, or to luxuriate upon rank sea-weed or fish upon the sea-coast. The best pastures of natural and artificial grasses are prepared for their special behoof, hay is laid up for their winter store, green crops and pulse are cultivated to a large extent, and the choicest oleaginous food,

meals, and various delicacies to gladden their palates, are imported to a large extent, while the best of shelter is also provided for them. We boil and steam their vegetables and roots, and treat them as kindly as our own children. Chemistry is continually brought to bear upon the analysis of the substances to be tried as cattle-food, and those only selected for general adoption which are found to be most nutritious and fattening; while various experimentalists strive, from time to time, to make food-compounds for extensive use, which shall combine fattening qualities with portability. As no other country pays so much attention to the improvement of breeding and fattening cattle for the market, so no country has experimentalized more on the nature and property of cattle-food. Every useful substance is pressed into requisition, from the chaff or straw of the barn to the more expensive meals or prepared food.

When we look at the numbers and value of our cattle and sheep, the importance of making a due provision for their sustenance becomes evident. It is for this purpose chiefly that the large quantity of 17,000,000 to 20,000,000 tons of turnips and mangel-wurzel are annually grown in the kingdom for feeding our cattle and sheep in the winter. In Ireland 5,000,000 tons are annually grown; in Scotland 6,500,000 tons; and in England fully as much must be grown, although we have no specific returns. When we consider that a beast will eat a hundred-weight, and a sheep a quarter of a hundred-weight per day, a due provision of this esculent root is certainly very necessary.

But a number of other miscellaneous substances are pressed into service from cheapness, or as being readily at hand. Brewer's grains and malt commings are readily purchased by some, for feeding. Rye-meal, barley-meal, sago-flour, Indian-corn-meal, rice-meal, anything which can be obtained cheaply and in quantity, comes in useful for fattening calves, &c. Our American brethren have been growing tomatoes to feed their milch cows on; but we should suppose the crop would scarcely be a remunerative one, or indeed in any way so beneficial as our ordinary kinds of food. The sorgho stems would be far preferable, from their saccharine and fattening properties.

But as an element in the meat-manufacture, whether in the building up and development of the young and growing animal, the maintaining of the produce of the dairy-cow, or the final preparation of the animal for the butcher, linseed is of the highest importance to the agriculturist. Linseed-cakes have been shown by experiment to be far superior to Indian-corn, pulse, or any description of food, for the production of fat. English oil-cakes are of course preferable, from being fresher, and containing more oil; but the consumption of foreign oil-cake, as we have shown on former occasions, is largely extending, and bids fair still farther to increase—our imports now are about 100,000 tons, nearly half coming from the United States, and consisting chiefly of cotton seed cake. Although all the cake imported is not applied to feed-

ing purposes, some of the rape-cake being used for manure, still the bulk is for stock.

In Ohio and the other leading American States, a large quantity of Indian-corn stalks are used for fodder, and the cob is ground up for feeding; while in the West Indies the expressed stalk of the sugar-cane, and the tops which have been cut off, are highly relished by cattle.

An article of cattle-food that has come largely into use of late years is the legume known as "locust" beans, being the food of the carob tree (*Ceratonia siliqua*), of which considerable quantities are now imported as cattle-food. They are grown and consumed to a large extent in Spain, Portugal, Crete, and the greater part of Southern Europe. In Sicily the amount gathered reaches 11,000 or 12,000 tons a year. They have long been used as food for cattle in Spain, and other quarters, and are even relished by the inhabitants, when fresh and ripe, from the sweet pulp they contain. About 3,000 tons are grown in Portugal, and 2,000 tons are shipped annually from Crete. The mean of three analyses gives 65 per cent. of sugar and gum, and about 25 per cent. of nutritious vegetable matter. They are imported largely at Taganrog, and there is no doubt that their value as a feeding substance being appreciated, a very greatly increased supply could be obtained from several quarters in the Mediterranean.

How much of the science of farming and of all other arts depends upon the saving of material! upon imitating that beautiful law which chemistry teaches us, that in Nature nothing is lost! This was well demonstrated by Mr. Simmonds in his recent lecture on the utilization of waste substances. We may add another instance pertinent to the subject under notice. In Edinburgh there is a distillery of great extent, where economy of heat and material is especially carried out. The "dreg," a waste product, was produced in such quantities that all the cows in Edinburgh could not consume it, and there remained an enormous surplus which had to be discharged into the water of Leith. This nuisance the modern Athenians protested against as an outrage on their sweet-smelling city. Something had to be done. Seedeake had been used by farmers, and it occurred to the proprietors that the "dreg," as well as oil refuse, might be pressed into a cake. Machinery was accordingly fitted up, dreg-cake was prepared, and now the proprietors realize £60 a-week from the waste product, which, although so much despised in Edinburgh, is now sent to the farmers in all parts of Scotland, to be returned in the form of fat cattle and butter and cheese.

A French veterinary surgeon, of the Imperial Guard, has called the attention of the agricultural world to a biscuit-fodder for cattle in times of searcity occasioned by drought. It is composed of the usual provender—hay, grain, and pulse. To these may be added many others—such as the refuse of the wine-press, the pulp of various roots, the stalks of millet and maize, the leaves of the vine, the beet-root, and of certain trees, and the sweepings of the barn and hay-loft, which contain

a vast quantity of nutritious matter in the flowers and seeds of hay, which are generally thrown away. All these ingredients are bruised and chopped together; a mucilage of barley-flour is added, with a little salt;

and the mixture is then left to itself for a few hours until a slight fermentation has set in, when it is put into square moulds, made into cakes, and left to dry in a current of warm air.

THE SUPPLY AND DEMAND FOR RIDING-HORSES.

There may be some who do not care to meet the tenant farmer with a double-barrel in his hand; but there are few indeed who are not glad to see him with a good horse under him. We believe, in fact, the country gentleman would scarcely enjoy the best of all field sports as he should do, without he had the farmers to share it with him. This kind of sympathy, moreover, is altogether reciprocal. At a hunt dinner there is no toast given or responded to more heartily than "The Farmers;" while at an agricultural gathering we all know how genuine are the cheers and tally-hoes that welcome "Fox-hunting." Mr. Hudson, of Castle-acre, well represented the body of which he is so distinguished a member, when he said at East Dereham, only a few weeks since, that "the class in whose name he spoke were always with them (the members of the Norfolk Hunt) in heart, if they were not on their horses. He was only surprised there was a landlord in the county opposed to foxes. Such a man was no friend to his tenants. Two packs of hounds, he could show by figures, were worth a hundred thousand a-year to the country; and he was surprised that any person, whether owner or occupier, should be opposed to their being kept up."

This is high authority, and the only question is whether the farmers quite act up to their character. No doubt the majority are with the hounds in their hearts, if they be not there or thereabouts on their horses. But to come straight to the point, have they the horses to go with? The world, or perhaps more properly the sporting world, answers, as a rule, "decidedly not." There has been a deal of discussion going on, of late, both in print and private, on the difficulty of getting a really good weight-carrying horse; and one of the commonest deductions drawn from this is, that the farmers do not pay the attention they should to breeding him. They may be prodigal in their prices for Shorthorn bulls, especially nice as to the purity of their Down flock, and particular even as to their varieties of Dorkings and Cochins. But, notwithstanding that they generally have one or two coming on, they are more than careless as to the material from which to make good hacks and hunters. Almost any kind of mare, crossed with anything that may be handy, is generally considered amply sufficient; and the consequence is, that a tenant with a clever young one in his stable is something to talk of. We still emphasize Mr. Shaw and his two-year-old, and Mr. Battams and the four-year-old.

We have often, ere now, dwelt upon this subject, and we certainly should not continue to do so, were it not for two well-established facts. Good horses—

hunters, hacks, and harness horses—are wanted more than ever they were. Nothing sells so readily, either for the home or foreign market. We naturally look, in the first place, to the farmers for the supply. It may, however, be argued that these are slow to enter into such a hazardous pursuit as horse-breeding. But our second great fact is, that, as a rule, tenants do breed riding stock, but that they do not go about the business as they should do. As Mr. Robert Smith says, in the new number of the *Journal*, "there is a want of system in our arrangement and management." The natural result of such a course would be what he goes on to maintain, that "the horse is not a popular animal to breed." Under such circumstances it would be extraordinary if he were. With more care and "system" it is yet a very open question whether he might not become both popular and profitable. Another commentator, in the *Sporting Magazine*, and dating from so classic a shire as Northampton, thus amusingly describes how agriculturists, nine times in ten, set about horse-breeding.

"There is many a large farmer and wealthy yeoman in the midland districts of England, who, whilst he studies with his whole attention, and all the assistance of science, how to breed fat cattle or unwieldy pigs for Smithfield market and that jubilee of obesity the Baker-street show, neglects, as it would seem purposely, the very elements of success when raising an animal, the perfection of which would return him one hundred per cent. upon the capital expended. The general course adopted is as follows: John Bull has a good useful mare (N.B. *useful*, as applied to the equine race, invariably signifies an animal you would not have at a gift); which mare he and his have ridden to market, driven in a tax-cart, put in the plough, and called upon to render every service to which a quadruped can be put. Nay, there is a tradition that young John once rode her with the hounds, and that she jumped everything that came in her way with him—gates, hedges, stiles, and the famous Brimmersley Brook. But this account is rendered somewhat apocryphal by its having occurred when John was returning from a coursing dinner at which much drink was consumed, and the chase, according to his own version, having taken place by moonlight. Well, the old mare, when completely worn out, instead of being put quietly into the grave, or suffered to repose upon her laurels, is condemned to the cares of motherhood, and, for this purpose, is submitted to any travelling stallion that happens to be in the neighbourhood, totally irrespective of all combinations in make, shape, and quality. Both may be weak in the back, long in the legs, faulty

in the hocks, nay, touched in the wind, or otherwise afflicted with organic disease. What matter? 'Th' old mare was a run 'un in her time sure-ly!' and the horse, though he never started, doubtless was once entered for the Derby. So the produce, as may be expected, turns out a weak, weedy, and undersized foal—bad on its leg, like its sire; coarse in its appearance, like its dam; without the speed of the former, or the strength of the latter, but afflicted perhaps at the same time with the worst qualities of both!"

The very palpable remedy here is a thorough contradiction to the existing practice that anything is good enough to breed from. The first and chief care must be the selection of well bred, good shaped, and comparatively fresh mares. They are to be had, and few farmers need be told how to know them. The author, however, of the paper we have quoted from, and which we give in full in another place, prefers a means which sounds to us almost, if not altogether, impracticable. He would rather put thorough-bred mares to half-bred horses than vice versa. Now, a good-looking, thorough-bred, fresh mare, something fit to breed a hunter, will always command a price that few farmers would care to go to, whereas three-parts bred mares may be bought in comparatively cheap. More than this, a half-bred travelling stallion is generally a curse to his district. We have seen very few we should like to use on any terms. Bad heads, heavy shoulders, and lumber passing for power, are their usual characteristics; and neighbours, deceived by the something to look at, not having the thorough-bred, put half-bred mares to them—and we all know what must come of that. You cannot breed successfully from crosses, more especially we should say on the sire's side; and whether it be a stallion, a bull, or a ram, we must go direct to the pure breeds.

Never, certainly, was there such a pick or opportunity of thorough-bred horses to cross with. We give with this a list, prepared with great care, of somewhere about a hundred and fifty such stallions, distributed throughout the country, and there are doubtless many more not so publicly advertised. But here again we have to lament the want of system. Even if a man has determined to cross with nothing but a thorough-bred horse, he as likely as not uses the first within call, be he ever such a brute or a weed. Race-horses, it is well known, will run in all shapes and forms, and three-cornered powerless-looking animals will sometimes get racehorses. But, on the contrary, all our famous hunter sires have had the *look* of getting hunters, with size, substance, bone, and action. There is scarcely an exception to this, and so the farmer must not rely merely on pedigree and performance, but consult his own judgment, and ask himself directly if this be the sort of horse to breed hunters from. The premiums now offered so generally by our agricultural societies will gradually tend no doubt to the extended use of the really serviceable stallions; while a writer in *Bull's Life in London* has suggested another means, which is well worth some consideration from those to whom it is addressed:—

"Let the master of hounds in every district and county examine, or cause to be examined, by competent judges, including a 'vet,' the stallions which are to go the rounds in the localities in which he hunts. When he is satisfied that the horse is sound, strong, and free from hereditary disease of any kind prejudicial to stock, he should then give an accredited printed letter, or 'ticket of leave,' to the owner of the horse. Give this diploma to as many stallions as really deserve it, to be used in any or every county, town, or hamlet in Great Britain or elsewhere. Let noblemen, landed proprietors, wealthy farmers, and others interested in promoting the good breed, encourage this diploma system, not only as regards farm-horses, but stock of all kinds. Carry out the intentions of agricultural societies not alone by going to annual meetings and looking at others' good works, but try and contribute yourselves. What is the use of admiring only what others do, when there is little expense incurred in assisting in the right cause yourselves? If this plan be carried out, I have no doubt whatever that the number of brood-mares and breeders of horses for the hunting-field, the road, and for draught, will be greatly increased. The allurements of ribands, and flesh without muscle, to the eye of the inexperienced, will fade before the character of the stallion which has passed his examination before the 'council,' however it may be constituted."

There is no question at all that good horses are getting more and more in demand, both for our own use and for exportation. It is, indeed, a common matter of remark how systematically other nations are buying up our best stock. The Paris correspondent of the *Times* writes to say, "The purchase of horses is going on, and we are told that not only are the regular stables of Vincennes full of them, but that temporary sheds which have been prepared are equally crowded." Then, again, in Austria the horse would appear to be yet more prized; for, once obtained, the Government issues an official prohibition against his export! And *The Hull Packet* chronicles a cargo of "very valuable" riding and carriage horses for Antwerp, and another similar shipment for Hamburg. If there be no question as to the demand, the only one is whether it be worth the farmer's time to give more attention to the supply? At any rate, it is a branch of his business that has never yet been done anything like justice to, and that appears to us really worthy of a fair trial. We know that the dealer has so far had the credit of getting all the profit out of it, and that gentlemen are said to actually prefer buying of him to going to their own neighbours. Let our able friend from the Shires in a bit of a caution tell us the reason why:—

"We must give our word of advice to the farmer. Never have two prices. If you honestly believe your horse is worth £250, let no consideration induce you to sell him for £249 19s. 6d. Above all, avoid that ridiculous and unworthy practice of selling for £300 and giving £50 back. In horse-dealing, as in every thing else, an honest, straightforward course, backed

by reflection and common sense, will invariably succeed in the long run. And the chief cause, which has of late years prevented gentlemen from buying their hunters from farmers in their own neighbourhood, has been a practice, which has gradually crept in amongst the latter, of asking the squire a higher sum than will

be accepted from the dealer; nay, in some cases, the squire has actually bought the same horse from the professional for less money than it would have cost him in the first instance from his own neighbour and fellow-sportsman."

THE BREEDING OF HUNTERS.

BY THE AUTHOR OF "DIGBY GRAND," ETC.

"Nobilis hic, quocumque venit de gramine, cuius
Clara fuga, ante alios, et primis in æquore puvvis;
Sed venale pecus, Corythæ, posteritas, et
Hirpini, si rara jugo Victoria sedit."—JUVENAL.

No one can have hunted much in any of our popular countries without hearing complaints, which season by season seem to be repeated with greater emphasis, as to the increasing scarcity of horses up to weight. "I can't find them to carry me!" is the despairing exclamation of many and many a well-grown sportsman, who, from easy circumstances, a happy lot, and a sunshining disposition, backed by the efforts of a skilful cook, finds himself perhaps a stone or two heavier than he used to be; and who does not choose, even for the sake of his favourite amusement, to *punish* himself down to the lean sinevy proportions of a man in training. For the slim undergraduate, or the dashing cornet, who *will* be with them whether the hounds run or no, there are weeds in plenty able to go the pace and stay the distance; nay, for the hard-working man of business, or the toughened veteran, there is many a good honest hunter to be bought at a moderate and satisfactory price; and so long as the enthusiastic sportsman finds himself balanced, boots, breeches and all, by anything under thirteen stone in the opposite scale, he need neither baulk his ardour in the chase, nor his appetite at the dinner-table. It is when the additional pounds, that run him up to thirteen and a-half, fourteen, or even fifteen stone, require to be added, ere they raise his swan-necked spurs from off the carpet, that he begins to find out the true meaning of the phrase "hunting under difficulties."

Now, if we look at any field of gentlemen assembled in any of our English countries, we shall be surprised to find how numerous a portion of these equestrians are men who ride nearer fifteen stone than anything else; and although this may seem at first an unusual weight, our surprise at the fact will disappear, as it generally does, on a careful analysis of its cause.

It is well known in the ring that a man's fighting weight is commonly about a stone below that of his usual every-day condition, supposing him to be a hard-working mechanic, or craftsman, in good health; also that an eleven-stone man is what is termed a middle-weight. We may therefore put twelve stone as the average weight, not of our whole population, but of a strong healthy Englishman belonging to the working classes. We must likewise consider that the aristocracy and gentry are usually of even larger build than their humbler countrymen; also that those who indulge in the pastime of fox-hunting are not the *least* vigorous and athletic of their kind; and with good living, robust health, and plenty of sleep, it is not too much to give them twelve stone seven pounds, as a fair average weight. Few people are aware that the difference between a man stripped stark naked, and the same man dressed and armed *cap-a-pie* for the chase, in leathers and top-

boots, with a warm waistcoat, and scarlet lined with flannel, hat on head and whip in hand, is fourteen pounds! The truth of this statement is easily tested, as any one can try the experiment; and we therefore bring our sportsman to the steps of his own hall-door at thirteen stone seven pounds. No hunting saddle that has been in use a season, with girths, stirrup-irons, and breast-plate, can weigh much less than sixteen pounds; and two more, at least, in these days of nice handling and terrific instruments, must be allowed for the bridle. If our arithmetic be correct, we have added up a sum total of fourteen stone eleven pounds; and the balance of three pounds is all we are entitled to receive out of the fifteen stone.

Now these are no stout unwieldy gentlemen, who trot out to look about them, get an appetite, and so trot quietly home again, but strong skilful horsemen who must and *will* be carried wherever the hounds go; who object, moreover, to falls and scrambles and all such undignified exhibitions, except where fairly purchased and rendered unavoidable by the pace. Can we wonder that they find some difficulty in procuring the class of animal that can go on, field after field, over a deep and strongly-enclosed country, galloping freely and jumping safely with so considerable a burden on their backs? Again, the difficulties of hunting, as regards the *horse*, have been very much increased within the last half-century. We do not here allude to his *condition*. Doubtless good stable management is far more common than it used to be; though we cannot but think that even in the days of the far-famed Billesdon Coplew run, immortalized in the best hunting poem ever written, there must have been grooms at Melton who knew a thing or two, and that when

"Villiers, Cholmondeley, and Forster made such sharp play
(Not forgetting Germaine) never seen till that day;
Had you judged of these four by the trim of their pace,
At Bibury you'd thought they'd been riding a race!"

they had racing condition under them, as well as the rough-bred horses, with which to take such liberties; nor when

"Villiers esteemed it a serious bore
That no longer could Shuttlecock fly as before,"

he had reason to be dissatisfied either with his groom or his horse, or the pace at which he had rattled the flyer over the severe dips and wide-stretching pastures which intervene betwixt Tilton Wood and the Coplew.

No: condition is now generally understood; and well it ought to be, when we consider the difficulties which we expect our horses to overcome. In the first place, the pace of hounds is very considerably increased; and this fact accounts sufficiently for the lamentations, to which we are compelled to listen, as to the decrease of sport in modern times. "You never hear now," says the querulous *laudator temporis acti*, of fifteen miles from point to point! Don't you? Even this position we think might be successfully assailed; but that you do not often hear of such long and extended runs is very natural; and, for the simplest of all reasons—the

same animal is now run down in two-thirds of the distance and half the time. Foxes are continually rattled into and turned up, in from twenty to thirty minutes; each of which, with a slower system of pursuit, would have afforded a run of more than an hour. That the animal is as stout as his ancestors we have no good reason to doubt. There were gorse-coverts, and game-preserves, and poultry-yards, fifty years ago. There are woodlands, and vixens, and travelling dog-foxes, still. But that the pace at which he is compelled to fly for his life is considerably quicker we think none will be found to dispute. Again: formerly one man hunted where a dozen do now; and with increasing numbers has arisen a feeling of increasing ardour and emulation. Half-a-century ago, in a field of twenty or thirty horsemen at most, there were some five or six who rode to hounds, and the others were quite satisfied to follow these pioneers without a thought of ambition, save how to get safely to the end. Now, on the other hand, though out of a field of a hundred there may be no more than five or six who *can* ride, there are some five or six-and-twenty who *try*; aye! and try very hard too, regardless of neck, horseflesh, friendship, decency—alas! that we should say it, of the very hounds themselves! People hunt for pleasure. It is all very well for ourselves and other cautious sportsmen to prefer a well-regulated *journey* over half a county, in which we canter along at our ease, with plenty of time to spare, and destroy our fox at length by *boring* him to death with our protracted attentions; but young blood loves to be in a hurry, and there must be something highly exhilarating in the rattling two-and-twenty minutes that turns up a fox in the open, just before the good horse begins to fail; everything having gone right, and the said good horse having carried his rider, to the entire satisfaction of the latter, quite close to the hounds from end to end!

But the crowd of emulative spirits, at starting, is productive of much annoyance to the hunter. Instead of being nursed and spared for the first ten minutes, till the vessels are gradually filled, and the lungs gradually distended, he must be hustled along unmercifully over the first two or three fields, finding the largest and ugliest places in the fences selected for him, because all the gaps are occupied: he must be hurried ever plough, ridge and furrow, all the worst ground, nearly at top speed, and must not expect a refreshing pull and timely canter along a headland, until the crowd has been shaken off by the severity of such exertions; then, indeed, he finds it all plain sailing, and, if not "upset" by his previous efforts, he will probably get safe to the end of the run. But under-bred horses will not bear such liberties. It is only the thorough-bred, or very nearly thorough-bred horse, that has sufficient speed and stamina to recover the effects of thus being, so to speak, knocked out of time in the first ten minutes; and therefore it is to thorough-bred, or nearly thorough-bred horses, that the fifteen stone gentleman must look, if he would be well and safely carried over a flying country.

Now comes the difficulty. Where is this class of animal bred? and how is he to be procured? The refuse of Newmarket is speedy, but not strong. The good *useful* farmer's-looking nag, short on the leg, large in the barrel, deep in the ribs, but a little coarse about his mane and tail, is strong enough to carry a castle, and can do anything you ask him, at his own pace, but that pace is unfortunately a trot! Where is the combination to be met with? the upstanding sixteen hands flyer, with his neat spare head, reminding you of his sire, and the sunny slopes of Ascot, the day he won the Cup—with his lengthy shoulders, flat sinewy legs;

his deep brisket, and long clean flank; his angular quarters, and well let-down hocks, surmounted by the thin tail set on high in his back, and given to whisk upon slight provocation. He may not be very easy to ride; he may have some peculiar whims as to the manner in which he is taken hold of; and a decided objection to turning away from hounds. But with a rider who is as fond of the sport as himself; who is tender with his prejudices, and shares his enthusiasm; who gets him away close to the hounds, and holds him straight at his fences! well—well, we are making our own mouths water. There are moments in life that are worth a great deal! we seldom purchase them, however, at much below their value.

Now these horses *are* bred, and *are* to be procured; but the demand of late years has far exceeded the supply; and such a hunter as we have endeavoured to describe is cheap at three hundred guineas. Let us inquire into the causes of this scarcity of so remunerative an animal, in the greatest horse-breeding country in the world.

The late war, it appears to us, had nothing on earth to do with it. With the exception of a few officers' chargers, and, in so small a force as ours, the exception is scarcely worth mentioning, it was a different class of animal altogether that was used up, in the Crimean campaign. The countries adjoining the scene of strife were of course denuded of everything in the shape of a quadruped—horse, mule, and jackass; but, except as an excuse for the dealers, we doubt much whether the demands of the Service ever affected the market of hunters here. No; the class of animal we require is rare, not because it has been destroyed, but because it is not sufficiently liberally called into existence; and this, from no apathy or want of energy on the part of our English breeders, but from a variety of causes, of which ignorance and inattention to first principles are by no means the least apparent.

There is many a large farmer and wealthy yeoman in the midland districts of England, who, whilst he studies with his whole attention, and all the assistance of science, how to breed fat cattle or unwieldy pigs for Smithfield market and that jubilee of obesity the Baker-street show, neglects, as it would seem purposely, the very elements of success when raising and rearing an animal, the perfection of which would return him one hundred per cent. upon the capital expended. The general course adopted is as follows:—John Bull has a good useful mare (N.B. *useful* as applied to the equine race, invariably signifies an animal you would not have at a gift); which mare he and his have ridden to market, driven in a tax-cart, put in the plough, and called upon to render every service to which a quadruped can be put. Nay, there is a tradition that young John once rode her with the hounds, and that she jumped everything that came in her way with him—gates, hedges, stiles, and the famous Brimmersley Brook. But this account is rendered somewhat apocryphal by its having occurred when John was returning from a coursing dinner at which much drink was consumed, and the chase, according to his own version, having taken place by moonlight. Well, the old mare, when completely worn-out, instead of being put quietly into the grave, or suffered to repose upon her laurels, is condemned to the cares of mother-hood, and, for this purpose, is submitted to any travelling stallion that happens to be in the neighbourhood, totally irrespective of all combinations in make, shape, or quality. Both may be weak in the back, long in the legs, faulty in the hocks, nay, touched in the wind, or otherwise afflicted with organic disease. What matter? "Th'old mare was a run'up in her time aure-ly!" and the horse, though he

never started, doubtless was once entered for the Derby. So the produce, as may be expected, turns out a weak, weedy, and underzad foal—bad on its leg, like its sire; coarse in its appearance, like its dam; without the speed of the former, or the strength of the latter, but afflicted perhaps at the same time with the worst qualities of both. Now of all mistakes there is none so fatal as breeding from a worn-out mare. It is true that you will occasionally see a fine promising colt, thrown by an old thorough-bred mare of nearly a score of winters; but this is only the case in large establishments, where the said mare has been doing nothing since she ran at four years old, and has been renewing her constitution with rest and care, till she is actually fresher and stronger at fifteen than she was at five—a far different plight from that of the worn-out slave who, having worked till she can work no longer, is only then thought fit to be entrusted with the reproduction of her species.

It is now, we believe, an established physiological fact that the horse inherits his make, shape, and outward appearance, from his sire; his constitutional qualities, such as speed, courage, and endurance, from his dam. The idea has been long since exploded that what is termed a large roomy mare is likely to produce a big powerful foal. On the contrary, some of the finest horses we possess have been the produce of mere ponies; but then these were ponies only in size; and a monstrous animal, nearly twenty hands high, is now going the rounds of every fair in England, whose mother, if we are to believe the man who shows him, was little more than two-thirds of his height. The mare, however, from which we propose to breed, should be a thoroughly-good one, and still retaining the whole freshness and vigour of her constitution. She should also be extremely well-bred; for if her inner qualities are more especially to descend to her offspring, it is indispensable that she should possess those lasting properties of wind and endurance, without which a horse is the most cumbersome possession on the face of the earth. We would much prefer to put a thorough-bred mare to a half-bred horse, than *vice versa*, though the latter is by far the commoner practice, and that amongst our intelligent and scientific farmers—men who make but few mistakes in the breeding of any other description of stock. We believe there is yet much to be discovered as to the influence of "blood" upon future generations. Several curious experiments have been tried both with cattle, sheep, and pigs. Most breeders, we think, will bear us out in affirming that, to use their own term as regards *quality*, the influence of the female is paramount.

It appears to us that in order to breed an animal that shall eventually become a *hunter*, that mare should be selected who has proved herself both speedy, courageous, and enduring. In the prime of life, and whilst all her functions are at their utmost vigour, she should be put to a short-legged stallion, with deep hind ribs, powerful quarters, and, above all, a good back. If thorough-bred so much the better. Nor should we repudiate him because he had won, or run well-up, in a Derby; although a two-mile scurry at three years old is no very rational test of the merits of an animal which Nature seems to intend shall not come to its prime till six, and which, for all useful purposes, must be capable of carrying a much heavier weight a much longer distance than is required to win the Olympic crown of modern ambition at Epsom. Such horses as old Defence, Venison, Johnny, and a few others, strike us as the models on which to form our ideas of a stallion; and to such horses we would look, regardless of trouble and expense, as the sires of our future favourites.

There is no doubt that, under the present Turf system of "small profits and quick returns," involving a multiplicity of

two-year-old stakes, and a consequent forcing of foals and yearlings, just as a hot-house gardener forces grapes and pine-apples, the style of horse to which we allude is becoming scarcer year by year; and it is indeed almost a national question whether something cannot be done to check the increasing evil. Our mild and paternal Government (perhaps more mild than paternal) systematically opposes all interference with private enterprise. We cannot but think, however, that a national stake of heavy amount, given yearly at Ascot for animals in their real natural prime, would have a most beneficial effect. Racing men will laugh at us when we say that we should like to see a sweepstakes *worth winning* run off in Her Majesty's presence—for six-year-olds and upwards, four miles, and carrying from thirteen to fourteen stone!

If the money made it worth while, and indeed to do so it would have to be counted out in thousands, what a show of horses should we see, before even the present generation had passed away! We know now, unnatural as is the treatment to which he is subjected, to what fine proportions the six-year-old arrives, when his racing career is over, and he has been put to the stud; and we may easily imagine what a magnificent sight would be afforded by a field of such animals, kept back and prepared from their very foal-hood for this one great event!

To return, however, to the breeder. If, as is generally the case, he is a farmer, he need not grudge considerable expense in procuring the services of a first-rate stallion. The keep of his young one, although, if calculated week by week, it would run up to a considerable amount, is an outlay which he does not feel; and, as soon as it is turned three years old, he cannot do better than make it earn its provender by gentle and easy work. "Shepherding," and such quiet jobs about a farm, form the best possible education for a future hunter: they give him fresh air and slow strengthening exercise; they accustom him to variety of ground, and make him quiet and tractable at gates and gaps, mounting and dismounting, &c.: also if his master be a good horseman—and there are few of our English farmers but are thoroughly at home in the saddle—they form his action, and bring his paces to perfection. We may here observe that nothing improves a young horse so much as *trotting* him across "ridge and furrow;" it supple his neck; teaches him to use his shoulders; makes him quick upon his legs; and beats all the circling and lunging in the world. Now, although he must have plenty of good corn and old bay, in fact the more he can be brought to consume of each the better, we think any farmer will bear us out in affirming that twenty-five pounds *per annum* is a very liberal allowance as the sum by which he is out of pocket from his young horse; this includes shoeing, farriery, &c. On this calculation, with the addition of the twenty-five he may have cost before he was born (and this affords him the noblest parentage going), he would represent £150 on attaining the age of five years; and his master, if wise, would not dream of selling him before that period. Now the sort of horse that may thus be produced with care and attention in breeding, as to size and quality, with good keep, good riding, and good usage during youth, and hard condition when arriving at maturity, becomes, in all probability, a first-class hunter well up to fourteen stone; and a first-class hunter, well up to fourteen stone, is just as safe to command £250 in the hunting field, as a guinea is to fetch one-and-twenty shillings in a counting-house.

He may be sold for a good deal more; and a nice light mouth, with a temperate confident style of fencing—both of which adventitious advantages may be given him by his breeder and instructor—will run him up to an almost fabulous price; but £250 is the *minimum*, and £250 we expect such a horse is safe to fetch.

There are of course casualties and chances in all trades; else why is man gifted by Providence with energy, forethought, and decision? The animal *may* turn out good-for-nothing. He *may* also break his own neck, and his rider's too, in a rabbit-hole! but such a catastrophe is, at least, improbable; and even should the venture never turn out good enough for a hunter, a strapping high-bred horse, sound, and in good condition, will always bring a remunerative price as a charger or carriage-horse.

But we must give our word of advice to the farmer who breeds and rides him. *Never* have two prices. If you honestly believe your horse is worth £250, let no consideration induce you to sell him for £249 19s. 6d. Above all, avoid that ridiculous and unworthy practice of selling for £300 and giving £50 back. In horse-dealing, as in everything else, an honest straightforward course, backed by reflection and common sense, will invariably succeed in the long-run. And the chief cause, which has of late years prevented gentlemen from buying their hunters from farmers in their own neighbourhood, has been a practice, which has gradually crept in amongst the latter, of asking the acquire a higher sum than will be accepted from the dealer; nay, in some cases, the squire has actually bought the same horse from the professional for less money than it would have cost him in the first instance from his own neighbour and fellow-sportsman. "Honesty is the best policy," quoth the Scotchman, who, as he said to himself, "had tried *both*." And although there may be nothing positively dishonest in thus asking one man a higher price than another for the same article, it is scarcely a very frank proceeding, and tends little to promote that confidence and good feeling which is the very spirit of exchange and barter.

All of our farmers and yeomen, who come out hunting, must have remarked how instantaneously a likely-looking horse is "snapped up," particularly in the grass countries. A heavy man might go out day after day with the Quorn or Pynchley hounds, with his cheque-book in his pocket, and find, at the end of a good many weeks, he had failed in supplying himself with a stud of hunters. Horses he would be offered in plenty; but of the real weight-carrying animal, that can go the pace which he considers a fit mount in a burst from Shankton Holt or the Coplow, he would see but few specimens for sale. They are bought-up by the large dealers long before they are shown in the hunting-field; and most of the best horses in Leicester-

shire and Northamptonshire have found their way into those counties from the north and west of England. This need not be the case. If the farmer only knew his own interest, he has the best of markets for his young horses at his own door. If he would pay a little more attention to the first laws of nature in breeding, take a little more pains with education and rearing, obtain the character of being a straightforward man, with *one* price to all alike, he would find customers enough, and to spare, every day he put on his boots and breeches to go out with the hounds.

The demand, we repeat, is extraordinary: the supply, at the present time, totally inadequate. Not only do men of all ages and classes and professions come regularly out hunting, but the fair sex are promising day by day to beat the less enterprising half of the species clear out of the field. During the last season or two we have seen ladies riding not only better (whatever they do, they contrive to do *well*) but harder and *straighter* than nine-tenths of the men who are out, going, in fact, "in the first flight." And this is no child's play, as we all know, when hounds are running hard over the shires. For ourselves, we confess we shudder to witness their performances. Beautifully as they do it, it is a perilous exhibition. To a man, a fall is simply a ludicrous mishap—to a woman, a dangerous accident. A lady who goes out hunting should ride the most perfect animal in the world—a fine goer; a temperate and active fencer; in short, a safe and perfect hunter; and then—she should never ride him over anything that can possibly risk a fall. But to carry a fair equestrian *with* and not *after* hounds, such an animal is required as we can scarcely hope to find till the winged favourite of the Muses makes his appearance once more on earth; and even he, if we are to believe the poets, good as he was, gave Bellerophon a cropper;

In this commercial and enterprising country, demand is pretty sure to be succeeded by supply; and we hope in a very few years to see a far greater number of first-class horses in the hunting-field than at present; but we need not insist that this state of things can only be arrived at by the attention of farmers and breeders being more exclusively directed to the first principles of generation and reproduction, and their conviction that the same causes, which tend to improve all inferior descriptions of stock, operate with as direct and perceptible an effect on that noblest of all animals—the horse.—Sporting Magazine.

THE TRADE IN GUANO.

Two important interests of the State—the agricultural and the shipping—are in a distressed condition just now; each of which might be greatly benefited by a free trade in guano; and we perceive a movement is on foot in some of the commercial ports, having in view the accomplishment of this desirable object. Among other bodies, the Belfast Chamber of Commerce has just memorialized the Secretary of State, praying that free trade in guano may be established.

The cheaper and more extended supply of guano is a matter of great moment. The depreciation of all agricultural produce, together with the high price of the manure, considerably modified the consumption last year, compared with former years, and increased that of bones and of artificial and less-expensive fertilizers. The reduction in price from £13 10s. to £12 per ton, made by the agents of the Peruvian Government in the

autumn, had the effect of lowering also, to some extent, the value of other descriptions.

This reduction was probably the result of the official letter of Lord Malmesbury, dated the 28th of July last, to Senor de Rivero, the Peruvian Minister in this country, urging that a reduction of price was greatly desired, and that it would benefit Peru, by causing an increased consumption; although the Parliamentary paper recently published on the subject only contains this letter and Senor de Rivero's reply that he would call the attention of the Lima Government thereto, and communicate to Lord Malmesbury such answer as might be obtained. No official reply seems to have been condescended by the Peruvian Government; or if so, it does not appear in this correspondence.

The guano trade has become of great and growing importance to the agriculturists of Great Britain, and

this valuable fertilizer has compensated them in some degree for the loss of protection; but the outlay on it is enormous. The overeropped lands of Great Britain, the rice fields of Italy, the vine lands of Germany, the sugar-cane fields of the West Indies and Mauritius, the exhausted coffee plantations of Brazil, and the arid plains of Peru—all testify to its fertilizing properties.

Since the first introduction of guano, about seventeen years ago, we have imported upwards of 2,500,000 tons of all kinds at a cost of more than £30,000,000 sterling; and other countries are now drawing largely upon the deposits. The exportation of guano began in 1841, under contract with the house of Messrs. Quiros, Allier, and Co. Up to the end of 1856 the shipments of Peruvian guano from the Chinchas had been nearly 2,000,000 tons. The net proceeds on this, after defraying charges, was £7,850,927. The profit on the sales of 1857 were £2,507,603. The total shipments up to June, 1858, amounted to close upon 2,500,000 tons, besides a stock in the hands of the consignees of 466,000 tons. The losses at sea during the whole time have only been about 50,000 tons. But the Government complain of a great waste in the process of loading, the estimate of loss being fully 16 per cent. of the whole guano shipped, owing to the carelessness in loading and the quantity shot overboard. To avoid this serious loss, the Government has now erected a wharf, where vessels of any tonnage can go alongside to load; and by a railway the guano is brought on board the ships from the deposits. Besides this, in order that the captains of vessels should not go to sea with their cargoes of guano in an unseaworthy state, all vessels, after receiving their cargoes, are sent to Callao, to undergo a proper survey. Thus the sea risks are likely to be greatly lessened.

The large yearly imports of guano called into existence a considerable portion of the large-sized ships. In 1858, however, this source of employment for the shipowner failed, like many others. The year began with freights at 60s.; a price unusually low, though rendered necessary by the enormous stock then on hand. Shipowners were found, however, to accept that price in such numbers, that it became necessary totally to suspend chartering. In the close of the year business was, however, resumed, with freights as low as 50s.

The stock of Peruvian guano in London and Liverpool had accumulated so far beyond the current demand, that it is understood the supply, for some time at least, will be on a correspondingly reduced scale. At present rates, then, an increased consumption may reasonably be looked for this season; and the farmers may probably be induced to use, along with the Peruvian, those qualities containing a large per-centage of phosphates.

The Kooria-Mooria deposit, about which there was so much speculation, has proved a failure. Guano arrived in limited quantities from those islands; but the quality, which varies very much, is considered inferior to the expectations held out; and from the unfortunate result of the cargoes from that quarter, which

arrived after the season was over, and which in many cases were forced upon the market, and did not realize one-half the stipulated freight, there is no great temptation to the shipowners to embark in so hazardous an enterprise. Several other cargoes from new deposits on the west coast of America arrived in the United Kingdom, and one in the Clyde. This guano in appearance and analysis resembles Ichaboe; but the deposit is very limited. It fetches, however, £2 per ton more than the African, and is about £1 in price below the Bolivian.

In the close of 1856, Messrs. Anthony Gibbs and Son were requested by the Peruvian Government to take charge also of the guano sales in Spain, hitherto confided to Messrs. C. De Murriek and Co., and they have a commission of 4½ per cent. on the sales—a voluntary reduction of 1 per cent. on the former commission. The change of agents in the United States has also caused a considerable saving in the commission and charges. A report from the inspectors sent from Peru to Europe and the United States is to be laid before the Congress.

However much we may appreciate the value of guano as a fertilizer, and the importance of obtaining a due supply for our farmers, we should like to see more freedom in the trade, and a greater degree of liberality manifested by the Peruvian Government. When they have already derived a net profit of nearly £11,000,000 upon this one article of export—an article attended with neither risk nor outlay to themselves—they might endeavour to facilitate its more extended use by still further lowering the charges, and throwing open the trade, instead of continuing it as a monopoly, with the sales confined to one house.

The supply in the Chinchas is yet ample to meet all the wants of agriculture for many years to come; and ere these deposits can be exhausted, others formed by the myriads of sea-birds frequenting these regions will be available. Every reduction in the price, every facility afforded in extending the trade in this valuable fertilizer, must necessarily benefit the Government interested, equally with the consumer; and it is but a narrow-minded policy which screws up the price to the utmost stretch at which it can be maintained.

Besides the Peruvian guano, our imports from other sources do not amount to 15,000 or 20,000 tons a year, the Patagonian, Chilian, and African coming in in very small quantities. As Lord Palmerston recently observed, at the Romsey Agricultural Society, "The time is not very far distant when the foreign supply will cease, and when domestic guano will be the source to which the farmer must apply." Although the supply of Peruvian guano is not likely, we think, to cease for some years to come, yet there can be no doubt that the interests of agriculture demand a substitute; and the discovery of such a manure now, when the principles of chemistry have familiarized us with the constituents, is not difficult: the only question is the adequate manufacture, and a supply commensurate with the wants of agriculture, at home and abroad, at a fair and reasonable price.

IRELAND AND IRISH AGRICULTURE.

In the month of August, 1857, I had again the pleasure to visit the sister country, and last year I attended the meeting of the Royal Agricultural Improvement Society of Ireland. It was one of those visits which to me is of the greatest interest, and gives me the liveliest gratification. One never tires of engagements which open out to us means of usefulness in our own way, and where a country's welfare is the object and the permanent improvement of its agriculture the aim and result. I say one never tires in these pursuits; and they ought to be aided by the most vigilant and persevering endeavours of every intelligent agriculturist. Nothing can withstand the world's competition, in a country like ours, but the progressive improvement of its agriculture. The superiority of our cattle, sheep, horses, and other domestic animals, the extra produce, weight, and quality of our grain and root crops are alone a guarantee for the prosperity of our agriculture. To attain, uphold, and excel in these departments is worthy the best efforts of every practical farmer, and to promote these efforts, and to bring before practical farmers every improvement which has been effected either in the breeding or fattening of farm stock, the culture of the soil, the selections and stocks of modern varieties of grain and seeds, of manures and rotations of cropping, or again of the vast improvement in agricultural implements and machinery, is the main object of agricultural societies; and to a man ever anxious to promote the best interests of his own department of business, it is a source of great satisfaction thus to be enabled to give his aid on such highly important occasions.

My object in giving "jottings from my note-book" taken on my journey from Dublin to Londonderry, is to call attention to many plain facts, many notices of customs, many practices in business, with the view of showing that errors in practice abound, and that with common attention and care great improvements may be made without turning everything "topsy turvey" or even interfering with the present very unsatisfactory system of occupation. I wish to show things as they are, and in a subsequent paper or two to suggest how these small farms, these inadequate occupations for a country's real good, can be much benefited by an improved and inexpensive mode of culture and cropping.

Dublin, August 12th, 1858.—Left by the 8:30 train for Drogheda; took a convenient seat in the coupe, in order to view the country to the greatest advantage on passing along. For some time we pass by the coast along through a flat country, with here and there a pretty inlet or small bay: I am surprised to find the crops so backward, the harvest in England being nearly completed; they certainly are much exposed to cold and stormy winds from the sea, and hence their present green and backward state: potatoes also backward; land not good. Pass an old castle to the left; now pass-

ing through cuttings; crops all in reality green, no appearance of ripening yet. Arrive at Skerries Station; soil stiff clay, badly farmed, the crops chiefly oats; pastures all sorts of weeds; again come upon the everlasting rag-wort, the pest of Irish grazing; real Irish farms, farms apparently very small and sadly done: keep along the coast; holdings very small evidently. Now at Balbriggan Station, famed for its peculiar manufacture of fine woollen stockings, unbleached; pass Martello Towers along the coast; potato crops good; fine park to our left. Now at Gormanston Station: lands very weedy, particularly the small grass pastures, full of rag-wort; hay stacked in small cobs, after the French fashion, and tied around and fastened down with hay-bands and stakes, a very prejudicial practice which cannot be too strongly condemned: what would our metropolitan hay dealers say to such a practice? Laytown Station: farming still indifferently carried out, but being all along by a cold and stormy sea coast it permits some palliation; see no sheep anywhere; but as for the grass lands, they appear to lay themselves down to pastures without leave or licence of the occupiers, hence they are covered with almost every kind of weed known to infest grass lands; with much pleasure I notice some better farming to our left; pretty view to the right; see some short-horn cattle; we presently arrive upon a good farm to the right having a capital herd of shorthorns grazing upon it. Arrive at Drogheda. Was greatly interested in viewing in the distance the site of the battle-field of the Boyne, the deciding engagement which established protestantism in these realms by the defeat of James II., and the elevation to the throne of William III. The battle, though so very important in its results, was by no means a destructive one, the victors only losing 400 men, and the vanquished about 1,000; not like the dreadful massacre of the inhabitants of Drogheda, ordered by Cromwell, in 1649, which lasted five days. Here is one of the most magnificent railway-bridges known. We cross at a very high elevation on arches of immense span, and have a fine view of a fine town, containing near 20,000 inhabitants.

The soil along our route appears similar in character to that along the route described in my first paper to Waterford, being clay mixed with pebble stones. The clay is of a good depth, and capable of bearing fine crops under good cultivation. Hay is all out yet; much in swathe; none carted. The land now, as we pass along, is in good staple, but badly managed; the crops backward, some quite green; fields all small; division fences here of gorse, small banks are general. The holdings must be all small; we see no farm-buildings nor farm-houses. We roll on and on, and still the same fields, small crops, various and backward, but few indeed to be called good; neither fertility nor cleanliness cared for. What can be done to improve this state of things? One

really feels to have the power to give some better notions of managing land than is here practised. Stay a bit; here are some large fields of grass, better grazed and managed; but no, some boggy land to the right again appears, not much under tillage; country and farming much better; capital herds of cattle for Ireland. We are now on a single line of rail, broad-gauge generally. Much cattle grazed. Now again in a better district, and very well farmed. Now meet with flax, the first I have seen in culture on this line. Reach Dunleer. It appears to be the precise time for haymaking, all being in the very midst of the season: the potato crops look unpromising; soil good. How do they manage to get their hay together without forks or rakes, or nearly so? By arms and hands. Fine country now; small holdings; crops indifferent all the way from the past station, and further.

We are now at Castlebellingham. We pass on. The crops now give evidence of better farming; all looks to be better done. But we soon leave it, and complain again; no good oats; work slovenly done; stock black Irish down here all along the route; all poor, poor. On, on! not better. Now a nice park to our right, and an old tower; and, what is better, we find larger fields, much better farmed and grazed where it is to be found, and also larger farms, equally well done.

Now reach Dundalk. The country is undulating, and of a very useful agricultural character. Notice a capital union-house, and a singular-looking building on our right appears to be an infirmary or charitable institution; larger farms with gates off line, of singular radial make, and regular appointments. Now pass a high hill or mountain at some distance on our right; the radial gates all along; sad villages, cottages they can scarcely be called, not fit for humanity; stone cropping out now; queer-looking stone walls, but not high; poor land and poorly ordered, boggy and wretched, still very poor; abrupt and rather steep rugged dales or uncouth ravines, but not high.

Inniskeen: Now pass cabins—cabins, but such cabins—narrow gullies, and watercourses, the borders all under some kind of farm management, but rude in the extreme; passing now along a very picturesque stream; no stock anywhere. We go on and on, and find worse and worse. Now most desolate and dreary, have not seen its counterpart in my travels for country and dwellings; reminds me of some parts of Westmoreland, where the nooks and occasional flat plots on the mountain sides receive a kind of culture. There is a degree of reclamation of the soil attempted almost everywhere, as we observe on passing, but it is without judgment, and the crops, such as they are, are in a most foul and unsatisfactory state. Many spots, if drained and cleaned, would yield a good return; but the idea of draining or road-making in this part of the country is certainly yet in its infancy. Nasty, dirty, slovenly homesteads. We still go on; now water and bog, bog and water; hay very thin; more weeds. Now we come to somewhat better doings; better and better. Reach Castleblaney: better potatoes and fair flax crops; again all poor, and likely to be; flax, potatoes; no drainage;

bogs deep; pass a good place to the left amongst this sheer desolation.

Ballybay: All bad, bad; flax, flax; ditto, ditto; plot after plot, and none good. Evidently all small holdings, say from three to five acres each, apparently all on the limestone rock. The land, when tired of cropping, appears to rest itself; I see no signs of laying down anywhere. Potatoes here, as elsewhere, are nearly all cultivated upon the lazy-bed system, *i. e.*, little stetches set and covered by the soil from a trench dug along the whole length, and scattered over the stetch: all looks uncomfortable.

Monaghan-road Station: Pass numbers of miniature lakes or meres; plots of flax everywhere—bad, bad; more, and still more, but not one fair crop to be seen. This must be very unprofitable cultivation. We soon reach a better country, broad and open, forming a good agricultural district under proper culture. But these four and five acre holdings, how are they to be farmed? It can only be in accordance with cottage husbandry, upon its best principles; and much may in this way be effected, with care, economy, and industry. I shall try and help, if possible. Much good arises from discussion and public remarks upon failures here, and bad management there. I will try and engage the press to lend its all-powerful aid. But I forget that at this time, Aug. 12, all are here fully engaged in mowing, haymaking, and the like; matters of business almost forgotten, for this season, in England. How is all this? Now in an improving district. Flax better. Nearly all three to four acre holdings, each having a plot of flax growing, or, rather, pulled from them. Country fair; but such little plots. Bad cabins—cottages? *No, no!* Now reach Newbliss Station. Still mowing grass and making hay. How very backward! All potatoes in the district fair, but failing; badly managed. Pass now some very pretty spots or residences in a good country; some beautiful scenery in dell and valley character, but boggy. Pass a canal—some choice scenery. Mowing, as usual. Arrive at Clones, a very pretty and undulating district. For once, see some nice cottages—gardens cultivated and fenced. The country for a considerable distance appears to partake much of Leicestershire scenery and character of soil. All might be made available for the best cultivation, and profitable; grain upon seed-shift rotations. Pass a large bog—"Irish bog"—the mound for scores of acres twenty feet thick. Potatoes everywhere. Another bog, about ten feet thick. Pass a well-stocked fruit-orchard, an unusual thing along the route. The country now is more even, but has nice undulations, and soil rather heavier. We could easily imagine some beautiful farms might be made in this country—but those interminable small holdings! Well, we doubt not but that these small occupiers, when properly instructed as to their best interests, will make much of them. We do not propose to make large farms out of these holdings.

We are now at Newtown-Butler. What foul grass land, and in such a country as we have passed! What a shame! Ragwort, scabious, thistles, and other weeds in great and interesting variety. Passing on, we find the country

not quite so rich; but the land is convertible, and might do well with good farming. Compared with England, it looks so neglected: no life or energy, no capital expended in draining or other improvements, so far as can be seen, in any district all along the line of our route; besides, all looks so miserably dirty and uncomfortable. The part of the line of railway upon which we are now rolling along has not been long opened, and is not, in fact, yet completed to Enniskillen. It is carried, undoubtedly, through a rather wild and unknown district. On arriving at Lisnaskea Station, coaches and omnibuses await the train. The ride from Lisnaskea to Enniskillen is nearly even or upon the flat; and through a country possessing much useful land, but, like all the rest, no enlightened views have as yet appeared: the same backward cultivation; the same like occupations, or rather unusually small; and cabins the most wretched and miserable—no farm buildings, no hovels, no conveniences.

Lough Erne: The country through which we have passed lately might all drain there, I imagine; what a benefit, if once achieved! Cambridgeshire fensmen would soon drain it. Fine and abruptly undulating country behind, as far as the eye can reach. No corn cut; no hay carted. As usual, it is put into cocks, nicely raked or smoothed down, and left for a convenient time, if it ever comes. Now pass some bogs at various distances. Crops all green yet. Nearly, as far as I see, all oats and potatoes grown here; some good crops of turnips. Bad cabins; all more or less contiguous to one bog or another, and all looks wretched and comfortless. The bogs are numerous near this point, and vary from twenty to fifty feet in thickness.

We arrive at Enniskillen. All is gaiety. flags flying, bells ringing, &c.; and understand it is the anniversary of the relief of Londonderry, a day always observed in the North of Ireland. Leave for Londonderry: country still abrupt; cropping chiefly oats and potatoes, but better managed—mostly after the lazy-bed fashion. Lowthertown-road: All around is beautiful; all good. Passed deep valley; steep hills, not very high. Have plenty of rain in this district. Pass bogs again—bogs on the hills, bogs in the valleys. Still small holdings. Grass lands ever abounding with the Irish pest—ragwort, ragwort, ragwort! Nothing but oat crops to be seen. No wheats to be seen.

Frillick Station: Miserable villages; huts or cabins awful; the people too are Protestants; all miserable to an English eye and heart, poor miserable looking cows; the rail here runs on very high ground; bogs everywhere, the country by no means so good; oats not good, wheat poor and backward. Dro-more-road Station: The grass here as elsewhere appears to have laid itself down to rest again, and all in size like the little lazy-bed narrow stretches; this is far from profitable. The kind of pigs in Ireland are good, and are divided into two classes, white pigs and black pigs, but here they are black and white admixtures, but very serviceable animals; several turnip crops near, but all bad; glens here, glens there, all bad; what complaining! I am disappointed; must help them; country

flatter, all bad and badly farmed; pass a good plot of potatoes; all the same miserable nondescript kind of cows; land rather better, but badly done; pass a plot of Italian rye-grass. Fintona Junction: Everything looks most miserable and forbidding; poor, poor Ireland! the same; the same, but still worse cabins.

Arrive at Omagh Station, where, as the darkness was coming on, I was necessitated to shut up my note-book; however, from what I could observe on passing, and subsequently, I found the country and its farming between this place and Londonderry much in advance of other parts of the route through which I have passed; the farms larger, and many in the hands of private owners, who, adopting modern practices, have their farms admirably managed: I went over some that would do credit to Lincolnshire or Northamptonshire, or any part of England. On the sea side of Londonderry and along Lough Foyle there is a vast breadth of slob or flat shore, much of which has been enclosed, and is called slob-land. Draining and good cultivation would make it very productive: it has great depth of soil, but is much imbued with saline matter, which only draining and land floods or rains could dissipate. The breadth of land sown to oats in this district is great, but very few crops are heavy and productive; potatoes are good; there is also more grazing cattle and sheep around, and the lands are fairly though roughly grazed.

My return route was by Coleraine, Antrim, to Belfast. The line to Coleraine runs chiefly along the coast, and under the higher country, frequently on the slob-land; all is better done, and gives an English farmer a more favourable idea of Irish farming. From Coleraine the line passes over a diversified and interesting country, which I should like to follow in detail; suffice it however to say that with some exceptions the same small holdings, the same miserable cabins appear everywhere, although they are relieved by more substantial dwellings, and here and there a tolerable farmstead. The general character of its agriculture is also superior; flax is better and more abundant; wheat is grown; potatoes are better; oats very general; and not much grass, except as you approach Antrim, and then again towards the sea. At one point near Ballymena is a nice district of grass-land, and at Antrim some very superior land both arable and grass; my notes along this line would form the foundation for another paper, but I think sufficient has been said to show the general features of the agriculture and holdings of the North of Ireland, and I trust to draw from them one or two lessons of improvement which I with all deference would like to read to my Irish brethren; I can assure them I have no other aim than to add my little aid to the many powerful means now in full work to achieve the renovation of Irish agriculture, and the improvement of the holdings and general amelioration of the condition of the Irish peasantry.

It is, I am ready to confess, a great presumption for a plain, practical farmer like myself to attempt to write upon Ireland and its agriculture, particularly upon such a short acquaintance with facts, as I have shown in my past two papers to possess; but as I am not going to

enter upon the subject further than it bears upon the improvement of its labouring population, and the class of small farmers immediately above them, I take upon myself whatever blame or responsibility may attach to my papers; my sole aim is to aid in my humble way the many efforts now in progress to improve the social condition, and permanently to benefit the entire class.

The Irish agrarian population has long been a thorn in the side of every Government which has held office within my recollection. It is true the question relative to their amelioration used to be staved off from time to time; and the old remark, "it was no use legislating for Ireland," was oft repeated; but latterly much has been done, a poor-law has been established, tithes have been abolished, the sale of entailed and encumbered estates has been promoted and permitted, emigration has been encouraged, and other legislative benefits have been conferred. In appropriate connexion with these measures many societies have been established for the moral and religious advantage of these classes, more particularly such as Irish Societies, Irish Evangelical Societies, and hosts of others have been established. Irish Scripture readers, and ministers of religion have traversed the length and breadth of the land. The Bible has been disseminated, knowledge has been spread by the establishment of schools and lectures, &c., &c.; synonymous with all this has been the establishment of agricultural societies in many districts of the kingdom, and amongst these the Royal Agricultural Improvement Society of Ireland stands most prominent, carrying its usefulness at migratory periods all over the island. These and similar institutions, having for their object the intellectual, the moral, social, and religious improvement of the Irish population, cannot fail to have a beneficial effect sooner or later; and few things give me greater pleasure than to add my feeble contribution towards effecting an object fraught with such momentous consequences, and certain to be attended with such gratifying results.

Well, then, what are we first to attempt? I say first, try and elevate the minds, order of feeling, and habits of the population. Very good, but how is it to be done? I will try to point out some ways of doing this. I have been told by highly respectable persons, that you cannot improve the Irish labourer, he is a stereotyped man; his habits are fixed and unchangeable; you cannot elevate him; he has no ideas or notions beyond his present condition; give him higher wages, he spends the balance after providing for absolute necessaries in whisky or personal gratification; no additional comfort is once to be thought of; no new frock or new shoes for Bridget, or slop or jacket for Mike; no, nor is the wife one bit more cared for, except being permitted to join in the whisky potatoes. Now this I cannot at all give credit to; exceptional cases, and many of them no doubt there are, but I must conclude this to be a libel upon the general population. What! Cares not the Irish mother for the comfortable if not smart appearance of her daughter? or the Irish father for the respectability of his son? Depend upon it both are proud of their children, and would help them to advance in their con-

dition if they could. The great fact appears to me to be this: They have as a whole been so long pressed down with the most grievous poverty, that the attainment of a much better position in life seems quite hopeless, and they almost cease to aspire after it; and another reason is, that agricultural employment from the very nature of things in the country is scarce, and wages consequently are ground down to the very finest point. The whole order of things must be changed. The very foundation and structure of society must be up-heaved, both body and mind must be unfettered, a healthy and wholesome invigoration must be instilled into the class; they must be made to feel themselves men, men having a stake, interest, and consideration in the country and its soil, in their homes and their hearths; they must be made to feel that they live for a higher and holier purpose than to grovel in the dust and dirt of animal appetites and passions. I say then, he must be elevated in the order of his mind and feeling.

Well, Mr. Farmer, what of this? everybody would feel disposed to say the same, but just tell us how it is to be accomplished, how is this to be brought about? How will you up-heave the whole fabric of society? How will you elevate the ideas and feelings of the lower order of Irish? How will you give them a beneficial interest in the soil? How will you unfetter their minds, and make them feel themselves to be men living for higher purposes than to promote their own interests or selfish gratification, &c. &c.? Stay, stay; I am not one wit wiser than my neighbours, nor do I pretend to higher gifts; plain questions are often with difficulty answered. I am not going to do all this, nor am I about to give you clear and definite answers, but I will try to solve some of the many difficulties by which the subject is surrounded and encumbered.

My first point, then, is to elevate the character and feeling of the order of such peasantry I am to improve. Their position now is this: The labourers, for the most part, are extremely poor, without the means of ordinary subsistence—living on the most homely and cheapest food; generally clothed in rags; living in cabins or huts of the meanest kind, and crowded to excess; his family appear as miserable and wretched as possible, even more so than himself; in fact, without decent clothing for their bodies, to say nothing of their heads, legs, and feet, which seemed uncared for, even the sympathies and kind offices rendered by the wealthier here to the poor seems denied them there—they are looked upon as a lower degraded race, and generally the higher classes treat them as such. As to labour, it is scarce enough, and, when to be had, is paid for at the lowest possible rate: the men at tenpence or a shilling per day, the women at sixpence, the lads and lasses almost *nil*—perhaps a shilling per week. As for position in society, they have none—they are mere drudges for others. My limits will not permit me to say more. Now is this right? Is this as it ought to be? Most certainly not: but we ask again—How can you help it? How can you alter, and put it down? Why, in many ways. The first great movement must be on the part of the higher orders. I

mean the noblemen, gentlemen, clergymen, priests, and others possessing property and influence. I say the first movement must emanate from this class; and I am convinced of the correctness of the position I take. I am convinced that, in a moral, social, and pecuniary aspect, it would be one of the most beneficial speculations ever entered upon by mortal man. Don't tell me you cannot elevate the character and moral feelings of these people. I don't believe it. There never was a man, woman, or child who did not form a higher estimate of themselves when dressed in their Sunday clothing, or on appearing in their best—all feel it. It is against the nature of things to be otherwise. Depend upon it, these poor, distressed people can be raised in the scale of social humanity. Then set about it in good earnest. I know it cannot be done without great effort, and some sacrifice; but there are always benevolent minds and working-men in every district—you never depend upon namby-pamby donish people for anything: no; you have generally to push them aside out of the way. No one knows the true value of a working benevolent man in any district, either in this country or elsewhere—they are “the salt of the earth.” Well, it is to these men I appeal. I would not ask your covetous, selfish, purse-proud men to assist; nor your proud and grand gentleman—'tis no use. The sovereign of the one, and the *patronage* of the other, is all you can expect—they have too much to do for themselves. Nor would I depend upon the clergyman or the priest: no; they seldom act in unison—often in opposition: it is their way. The priest considers the other as a trespasser, and if he cannot oust him from his place he may prevent his usefulness in it. Now, I may be wrong; but it strikes me forcibly that here is a root of great bitterness—these two *religious teachers* being an hindrance to the moral advancement of the people. You cannot separate social and moral advancement from religion—it is a part and parcel of it; hence the jealousy between Protestant and Catholic. You must devise a scheme wherewith both may act in unison. Well, then, let it be simply the social advancement of the people, and we leave all the rest to follow. Now, one of my panaceas is the establishment of labourers' friend societies all over the kingdom of Ireland, to be carried out irrespective of creeds, or the position of the members or officers of the societies.

Now these labourers' friend societies embrace many laudable and noble efforts, which from time to time appear desirable to attempt. I now wish to speak from my own experience, having had the management of such a society for many years. I do most unhesitatingly assert that the good effected is astonishing, chiefly in this way. emulation of the most praiseworthy character is raised up and stimulated; one successful candidate urges another onward; there is a determination to excel excited—it spreads, competitors and non-competitors for our prizes alike exercise more care, more caution, more labour, and better general management is the result. The comfort of their families, the cleanliness and healthy condition of their cottages, the orderly and

comfortable appearance of their children, the profitable and ornamental culture of their gardens, the respect in which they hold themselves, their constant attendance upon divine worship, their absence from houses of intemperance, their anxiety to hear and acquire knowledge, their punctuality and industry in time and daily labour, and their general good conduct, is an abundant compensation to a generous and benevolent mind. I might also add, that as knowledge increases their foolish prejudices are uprooted, no opposition is made to the introduction of new implements, new machinery, or new modes of cropping; indeed they are almost hailed as accessories to improve their own condition, which, in truth, they really are, for it is an undoubted fact that in the immediate district from which I wrote the introduction of improved implements and machinery has greatly increased the demand for manual labour. You can't judiciously till your soil too much, and improved tillage promotes additional cropping, which, in its turn, absolutely demand more manual labour. And this is all right: the farmer obtains more and better crops, the labourer receives wages for planting and harvesting them. Well, then, I advocate the establishment of these societies throughout Ireland. The selection of objects or subjects most desirable for prizes must be left to the discretion and judgment of the various societies in every district, and suited to the state and condition of the locality; always bearing in mind the main object of these establishments—the elevation of the labouring classes. For this purpose I would suggest rewards or prizes for the cleanest and best-managed cottage and garden, for the best assortment of roots, for the best pig, the best poultry, or, again, for bringing up their families, or their children's proficiency in school acquirements and punctuality in attendance—the boys in knowledge, the girls in needlework, &c.; or, again, for their own skill and dexterity in workmanship—ploughing, ditching, draining, hedging, stacking, and the like; or, again, for mothers who have manifested the greatest care in bringing up their children; or, again, to widows who best support themselves, or servants for servitude; and in various other ways that from time to time appear desirable. To these encouragements and inducements I would add others, to working tradesmen and mechanics: to the one for cheap and comfortable clothing, shoes, &c.; or to the other for cheapness and excellence in the execution of every department of farm-work, for all the requirements of the farm. Or, again, I would provide district or village libraries for lending, or, if convenient, for reading rooms; or, again, courses of lectures on all common subjects; indeed, in short, I would have these societies provide in every way they possibly can for the progressive advancement and elevation of these classes. As to funds, I am well aware such great aims and ends cannot be achieved without great personal and pecuniary sacrifice; I would therefore suggest that in addition to these local or district societies, one large and general society for Ireland be got up, after the order of the Royal Irish Agricultural Improvement Society, to combine in its operations the whole of Ireland, who shall out of their funds make grants in aid of poor societies, or as they may see need; and for this purpose I would

further suggest a grant of funds from the Government or from the parochial rates should be placed at the disposal of this society for application for the above purposes. The all-important thing I contend for in this department of my subject is, the improvement and consequent elevation in character and condition of the agricultural labourer, the tradesman, and mechanic connected with agriculture.

I desire to devote this part chiefly to that class of occupiers immediately above the Irish labourer, *i. e.* the cottage or small farmer. This class in Ireland is exceedingly numerous, and their land for the most part is by no means well farmed or judiciously cropped. I wish to say a few words to them, and with the best intentions for their benefit. The number of holdings in Ireland was, in 1841, 685,309; but in 1851 they had decreased to 628,222, and were as follows:—Holdings under one acre 35,323; above one acre and not exceeding five, 91,618; above five acres and not exceeding fifteen acres, 203,331; above fifteen acres and not exceeding thirty acres, 145,380; above thirty acres 152,567. So that the total number of farms under thirty acres, out of 628,222 acres, is 330,272 acres, or considerably more than half. These happily are slowly decreasing, for we find that in 1856 the holdings not exceeding five acres were 82,035, as compared with 1850 of 91,618; not exceeding fifteen acres, 179,931, as compared with 203,331 in 1850—a certain indication of progressive improvement; but as I have before said, I do not propose any consolidation of these: I take them as they are, a necessary evil, which cannot be got rid of, and shall endeavour to point out measures or courses of management, with a view to their more profitable occupation. I am well aware that grave difficulties stand in the way of great changes, from the nature of the tenantry in many cases, the joint-tenantry of numbers, and also from the serious inconvenience of distance from the respective villages. My intention is to shirk all these matters, and merely confine myself to cottage or small farms generally.

The first thing then that I shall notice is the condition of their dwelling-houses. I was told that the usual mode of letting these farms was this: The land only was let, and the tenant just pleased himself about building a place for his residence; hence the great number of wretched hovels or cabins seen everywhere. It cannot be expected that the tenant, had he the means, would build a costly house; but it is also quite as unlooked for that any man should be content with such woful huts as a vast number of them are, and generally built upon the waste spot of the holding, frequently not consisting of more than one low mud floor room, covered after the cheapest and most slovenly fashion, with straw or stubble. And this, mind you, serves for all purposes—for kitchen and parlour, parents' and children's bed-room, and often has to accommodate the pig besides, to say nothing of the grandfather and grandmother of the family, who usually reside with their children. Talk of elevating the character and feeling of these inhabitants! why, what can be expected from a people herding together in this heathenish way? They must of necessity be a low and degraded

people, living in such a low and dirty condition. All those nice proprieties, those little modesties which the pure and correct-minded love to instil in all connected with them, and which forms the grace and charm of every shade of good society, cannot be acted upon here. There must be a coarseness, a low groveling vulgarism, and indelicacy of soul and of feeling most inimical to elevation of character. This vicious system at all events should be swept away. The landlord should provide a comfortable dwelling, and let it with his land. This would secure a more suitable order of cottages and dwellings at least, and on the somewhat larger holdings a better house and other farm conveniences ought to be erected. I know in what cost this plan would involve landowners. It would be very great; but there is no help for it; a great sacrifice must be made, or the wretched system will remain. Government has stepped forward to facilitate the sale of lands, the draining of lands, the permanent improvement of lands on entailed estates. Why not carry the aid to Irish landlords, to enable them to build as above, to make suitable roads, &c., and otherwise improve such estates? I am a great believer in inducements and encouragements of all kinds, in order to make much progress. Now I would, through agricultural societies (and I would have these aided by Government, all over the country) offer prizes for competition amongst this class of farmers; and amongst the foremost of them should be prizes for the neatest and best-ordered homesteads and gardens. My next would be for the best-managed farms, upon a graduated scale, in accordance with the size of the little farm. I would also offer prizes for the best corn crops, in best variety, and rotation of cropping; for the best cow and other domestic animals; for the best root crops, including potatoes; the best poultry; the best butter, &c., &c. I believe a laudable spirit of emulation to excel may thus be excited; and when once this spirit is infused, I know it will make rapid progress. There is something so pleasing and inspiring in being the winner, and going along with it, the thing exhibited, and the energy and thought and care bestowed to fit such for winning. This can never again be lost by the fortunate exhibitor; he has learned the lesson, and the knowledge thus obtained of the capabilities of his farm or his animals to produce for him this success will, I say, be never lost upon him; and the profit he derives from the excellence of either his crops or his animals will urge him onward. He sees—he knows what can be done. There can be no doubt whatever as to the great influence the prize system has had in improving British agriculture. Then, why not apply it in all its phases, according to its adaptability, to the requirements of Irish agriculture? Nay, it has already done immense benefit to Irish agriculture. The only thing now required, is to bring the system down to the order and holdings of the small farmers and cottagers. This can be best worked out by local societies in convenient suitable districts, which in that country should not be large—say, then, union districts. The chief promoters of the movement ought to be the landlords, clergy, priests, and agents. I think, as the districts are small, sufficient sums in subscriptions could

not be obtained. I would, therefore, that Government give permission to the boards of guardians in every union to appropriate out of the parochial funds such required sums as may be actually needed for this purpose, which I would designate as The Cottagers' Improvement Fund. I know I write very dogmatically upon this subject. I would not do so but for the fact that in my own immediate district this spirit of emulation has been generally excited or infused; and the improvements effected by the farmers in the production of every crop has been astonishing. And, what is equally gratifying, the labouring population have been made partakers of the same benefits; their garden-crops and allotment-fields evidencing great advancement in culture and order of cropping, and their little beds and borders abound with a great variety of beautiful flowers and flowering shrubs. I can give no better proof of the elevated order of their minds than this display of excellent taste and discrimination, and in such pleasing variety, as adjuncts and ornaments of a quiet and cleanly home.

Another most important mode of elevation of character, I again say, is by improving the minds of the people. This is chiefly to be done by the course I have already pointed out, *i. e.*, the establishment of district libraries; to which, I would add, where practicable amongst the population to which I more particularly address myself, the establishment of farmers' clubs, or societies for the diffusion of agricultural knowledge. These clubs, or societies, must constitute the organs of communication; and in whatever practical way they can, they must diffuse information, *i. e.*, by lectures, by the sale or lending of agricultural

books, papers, periodicals, and agricultural newspapers; or, again, by annual or occasional meetings for the exhibition of stock, roots, implements, &c. What a pleasant substitution for faction fights, maddening wakes, and suchlike revelries!

Another excellent mode of elevation and improvement would be the establishment of small model farms in every district, open to the public on suitable and convenient occasions; these model farms to be under the superintendence of every local society, and to be managed upon the best modern principles and practice of agriculture, and with the utmost regard to economy and simplicity. An expensive course of culture would utterly defeat the object sought to be attained. There must be nothing costly or speculative adopted, but plain cultivation upon scientific principles, and the variety of cropping and roots of the most approved kinds. The stock and implements, too, must be of the best kind, and their management shown. The fattening and ordering of the farm-stock would be highly important, as proving the amount of meat produced, or quality of stock provided for, by the artificial grass crops or root crops. The implements, too, must be of the simplest kind, and in accordance with modern improvements, but inexpensive, so that no prejudice may be excited by their introduction. All the order of management must be of the most business-like character, and adapted to the soil and climate—to exhibit to the surrounding occupiers what may be achieved by skill, industry, and knowledge.

In my next I will attempt to show various courses of cropping and modes of husbandry, &c., &c.

NEW FOOD AND NEW DOMESTIC ANIMALS.

The interminable discussions in the leading journals on the question of economizing and improving our dinner-festivities are at least likely to result in some general benefit, by promoting inquiry as to new sources of animal food; and it has brought out Professor Owen with his practical experience of the quality of eland meat fitted for the table, on which he has just experimented.

The popular topic of the day is, evidently, how we can add novelties to our food-supplies. On the Continent they are experimentalizing on some of the ordinary domestic animals not usually converted into food. Mr. Simmonds, in his recent interesting work on "The Curiosities of Animal Food," has suggested many novelties which, being considered dainties and delicacies in different countries, may be tested by those who think proper to try them.

The letter of Professor Owen on the quality of eland meat opens up many suggestions for consideration not only to those who have leisure and capital to carry out experiments at home, but especially to our colonists in the South and East.

In the work just mentioned above, the following notice is taken of the eland of Africa: "The eland is

the largest of the antelope tribe. The bulls attain to the height of nineteen hands at the shoulder, and frequently exceed 1,000 lbs. in weight. It fattens readily on the most meagre herbage of the desert, and to the delicious, tender, juicy, and wholesome nature of its flesh every hunter will bear witness who has regaled himself on the steaks broiled in the homely style of South African cookery, with none of the usual condiments or spices to give them an unnatural relish. The flesh has a peculiar sweetness, and is tender and fit for use the moment the animal is killed. It is hunted with avidity, on account of the delicacy of its flesh; but it is very rarely found within the limits of the Cape Colony, having been driven beyond the Orange river by the progress of civilization."

The opinion of Professor Owen and his brother-naturalists, forming the "committee of taste," is equally favourable, and was looked for with some interest, as the subject of an eland having been fattened and killed for the table by Viscount Hill was mentioned at the last meeting of the Zoological Society. We will quote *in extenso* therefore, for the information of our readers, the judgment formed upon this "new and superior kind of animal food which has been added

to the restricted choice from the mammalia class at present available in Europe"; adding thereto some further details which it may be desirable to make known respecting the animal.

The meat was of a bright colour and of a close, fine texture, but without any fat mixed with the lean. A good quantity of fat was accumulated round the kidneys and upon the inside of the ribs. After hanging ten days, the joint was simply roasted, with a part of the loin fat or suet, another part of this being made into a suet pudding. The meat, when brought to table and carved, presented the colour of pork. Committee unanimous as to its texture—the finest, closest, most tender and masticable of any meat. In taste, the first impression was of its sweetness and goodness, without any strongly marked speciality of flavour; it was compared with veal and with capon; finally, the suggestion that it was (*mammalian*) meat, with a *souçon* of pleasant flavour, was generally accepted.

Committee unanimous that a six-year-old eland this was but a young male) would most probably yield a meat equally fine in texture, with a more marked and distinctive flavour; and that the extreme delicacy of flavour might be due to the immaturity of the present animal. The portion of fat served with the joint differed from that of deer in not rapidly condensing into tallow, but retaining, like the best beef fat, its clear, melting character; it was perfection as fat. Suet pudding extremely light and delicate.

Ten years ago, in an article in *Sinmond's Colonial Magazine*, on the domestication of some of the wild animals of Southern Africa, especial attention was drawn to the eland, as promising beneficial results. This animal was formerly of not uncommon occurrence in the Cape colony, as numerous local appellations testify. It would be superfluous to enter into a detailed description of the eland, which has now been so successfully naturalized here.

Lord Derby was the first to secure and introduce it into England, having despatched a party to the interior of South Africa, with special directions to attend especially to the capture of the eland. This object was effected, and three or four young animals arrived safely at Knowsley Park. Since their transfer to the Zoological Society, and their diffusion over several noblemen's estates, they have thriven well, have become as docile as any domestic cattle, and the cows have annually produced and reared their calves.

The eland, having a very ponderous carcass, with short stout legs, and evidently possessing great strength it has been suggested might be made available for draught in the colonies. It fattens readily on the most meagre herbage of the desert, and can support drought better than almost any creature except the camel; and is found in large herds roaming over the wide yielding sands of the Kalagari desert, the South African Sahara, where it subsists for many weeks without water, obtaining a sufficiency of liquid from the succulent shrubs and wild water-melons which abound in that region.

There can hardly be a shadow of a doubt that, had

this subject been attended to in the youthful days of the Cape colony, stout and portly droves of elands might now be seen grazing over the different farms, or seeking the nightly kraal in company with sheep, oxen, and horses, or even drawing the lumbering wain.

Prior to experience, what animal could seem less fitted for a beast of burthen than the South American lama? While the Australian colonists are turning their attention to the wool-bearing animals, the alpaca, Angora and Cashmere goats, &c., they certainly should not neglect the food-yielding animals of the kindred climate of southern Africa. Considering how limited is the range and kind of animals native to Australia, the importance of increasing the stock is evident, and especially of those wild animals of the antelope tribe which can find their own sustenance without care or trouble.

While in former years our circumnavigating voyagers were zealous in introducing the useful domestic animals of Europe, the hog, the sheep, the dog, &c., to the new countries they visited, in later years, with the greater advantages offered by commerce and communication, settlers themselves in distant colonies have been far less attentive to this highly important subject. There is, it is true, just now, some prominence being given to the matter, which we trust will not be permitted to subside without realizing some beneficial results. A liberal grant has just been made by the Legislature of Victoria for the formation of a zoological collection in that colony; and we presume attention will be directed to the acquisition of useful animals, as well as those merely exhibited for curiosity. We may point to the hartebeest, the ourabi, the rhubok, the bushbok, and many other of the antelope tribe of southern Africa—to some even of the goat tribe, especially the Malabar goat, the flesh of which is tender and excellent, contrary to the general nature of the goat, and is in consequence more sought after than any game in Ceylon. These would be especially valuable, and would thrive well in Australia, and in time increase in the deserts and wild parts of that great island-continent.

The two species of the quagga of Africa have been broken to the saddle and harness: they are docile, and easily tamed. It is a stronger animal than the ass, of more pleasing aspect, and equally hardy. The quagga, though it might improve under domestication, would probably never equal the horse in strength or speed, but it would soon rival the mule, and in all likelihood would propagate itself far more abundantly than either the horse or ass.

These are some of the animals which most readily suggest themselves to the mind as capable of being domesticated, and becoming highly serviceable to man. But there are others, doubtless, which might be introduced into some of our colonies, and would prove useful, such as the fine Syrian races of asses, the yak, the camel, the elephant, the joolbul, a mule between the yak and the hill breed of cattle in India, the large humped bullocks of India, and others to which we may hereafter advert.

CHEESE—ITS MANUFACTURE AND QUALITY.

Whether it be true or not, that "poor men eat cheese for hunger, rich men for digestion," this kind of diet enters very largely into consumption in this kingdom, and in numberless varieties. We have it from the soft globular Dutch to the hard horny Suffolk skim, needing an axe to cut it, and which they say "pigs grunt at, dogs bark at, but neither of them dare bite"—from those famed Dorset cheeses which the rats left untouched on board ship, after eating some millstones by mistake, to the rare cream cheese, the rich Cheshire and Cheddar, and ripe Leicestershire Stilton. For nutritious properties, cheese stands higher in the chemist's estimation than even butchers' meat; and it is so useful, because readily available for food, requiring no subsequent preparation, and being easily kept. No wonder, therefore, that the total consumption for the United Kingdom should be reckoned at 120,000 tons annually. Twenty thousand tons, worth about a million sterling, are imported every year, principally from Holland, largely from the United States, and in less quantities from France, Sardinia, Tuscany, and other parts of the Continent—the home production being some 100,000 tons. Little cheese is made in Ireland, but a small quantity in Scotland; and the chief English cheese counties are Cheshire, Gloucester, Salop, Derby, and Leicester, in which more than three-fourths of the whole quantity of British cheese is made. Cheshire itself produces 12,000 tons a-year.

Milk will spontaneously separate into cream, curd, and whey. The art of cheese-making consists in the complete extraction of the whey, and in the proper compacting and curing of the curd, the richness of the cheese depending upon the quality of the milk, or the proportion of cream it may contain. The cheese of Cheshire is professedly made from new, unskimmed milk; but too often a portion of the cream is taken to be churned for butter, along with the small quantity of cream yielded by the whey. The operations of "setting" at the proper temperature, breaking the curd, draining off and squeezing out the whey, salting, pressing, and drying, are generally known. The improvements introduced of late years in the machinery and offices of the dairy are—first, the "curd-breaker," for cutting up the curd into small particles—superceding the old mode of three women kneeling around the tub and breaking the mass with their fingers—next, the "curd-mill," which breaks the curd after the whey has been drained from it in the cheese-vat, before finally putting it under the press—instead of the old tedious plan of again breaking it with the hands; and then the "lever-press," which is self-acting, and allows of the pressure being regulated by a weight sliding along the beam. This machine dispenses with the custom of kneeling upon and pressing the cheese with a board, or two or three people thrusting it with their hands, or pressing it for a time

before placing it under the heavy stone press. Now there is so much difficulty in effecting a perfect separation of the whey from the ingredients of the cheese, that improved forms of dairy utensils have been from time to time contrived for the purpose; some, indeed, forming a complete cheese-making apparatus in one vessel. And the value of these inventions lies, still further, in the fact that the richer the milk (and, consequently, the finer the cheese), the more difficulty is there in preventing cream and curd from being lost along with the whey. There is an increasing relish and demand for new milk in preference to skimmed-milk cheeses: Hence, to supply the best qualities profitably, in face of the large foreign importation, the home producer requires every mechanical or other assistance that can render the coagulation of the milk and the separation of the whey more effectual and economical. The inventions recently brought out do not introduce any new practice, so much as to render the operations simpler and less open to waste by slovenly and unskilful management. There is a saving in labour; while the result is less at the mercy of the dairy-maid. The most novel and interesting of these inventions is the cheese-making apparatus invented by Mr. Keevil, of Strand Farm, at Lacock, near Chippenham. It consists of a large circular metal milk-tub, with a wire-gauze strainer or filter at one side, having a slide-plug to prevent or permit the whey passing through; and a bar across the top, acting as a bearing for the frame of knives which rotate in the tub, and also as a purchase for the screw press-plate when the knives are removed, and this is placed upon the curd. The process is as follows:—When the curd is "set" sufficiently firm, the blades are made to turn gently round, cutting the curd vertically and horizontally into small squares; the bar across the mouth of the tub is then undone at each side, the spindle and frame of knives removed, and the curd allowed to settle for some twenty minutes. After it has fallen to the bottom, and the pure whey risen to the top, the semicircular plug is drawn up, a tap at the bottom of the filter is turned and the whey allowed to drain through. When the whey ceases to flow by its own gravitation, a cheese-cloth is spread over the curd, and the pressing-plate applied, the cloth being put down between the curd and the sides of the tub, to prevent any of it rising over the plate. This plate is perforated, and has a gutter sunk across it; and the pressure, applied by means of a screw, is at first light, so as not to squeeze out any of the cream and curd—the rule being to screw down the plate no faster than the whey flows clear and limpid over the pressing-plate. This part of the work will very much depend upon the quality of the curd, and therefore the dairy-man will have to be guided by experience in this as in the old process. The pressing-plate may have to be removed, the curd cut back

around the tub, placed in the middle, and the plate again applied until the whey is thoroughly removed, when the dry curd is broken and vatted in the usual manner. An increased weight and greater uniformity of quality are obtained by this new method of performing old processes. The tub or vessel is made either of brass or tin, and of any size up that holding ninety gallons. Messrs. Griffiths and Co., of Birmingham, are the manufacturers.

Another cheese-making apparatus, invented and manufactured by Edward Cockey and Sons, of Frome Selwood, comprises excellent arrangements for effecting the desired end. As exhibited at Chester by Messrs. Reeves, of Bratton, Wilts, it consists of a heating-boiler, inclosed in an iron case lined with fire-brick, and a patent cheese-tub with hollow chamber beneath the bottom for hot or cold water. This chamber is formed of copper, and the sides of the tub are strong tin plates. The boiler and cheese-tub are connected by iron pipes, with cocks for regulating the flow of hot

water, the pipes being so arranged as to provide means for a circulation of hot water to the cheese-room. A supply of cold water to the chamber beneath the tub is obtained at pleasure, so that any requisite temperature may be secured.

The cheese-making apparatus invented and manufactured by Mr. James Cornes, of Barbridge, Cheshire, is very much simpler and cheaper than either of the foregoing. The curd is lifted from the cheese-tub into this apparatus; the whey being filtered and run off through a strainer and pipe without labour. The curd can be cut and turned over without being lifted out, which avoids all waste; and the apparatus can be used with or without pressure on the curd. The curd is dry and fit for vating in a short time, and will retain all the fine qualities and flavour of the cheese, which is so frequently injured by the old mode of heaping a large quantity of curd in small baskets. The apparatus is mounted on wheels, in order to be conveniently moved to any part of a dairy.

THE AGRICULTURAL STATISTICS OF IRELAND.

While a hostility is still evinced to the collection and publication of Agricultural Statistics for England and Wales, we are unable to form any decided estimate of the progress of agricultural operations. It is, therefore, refreshing to be able to turn to ascertained data with respect to agricultural progress in other parts of the kingdom.

We have before us now the agricultural statistics of Ireland for the past year, which are as full and complete as could be desired, and well serve for comparison with former years. We have gone carefully through these returns, with the view of enabling our readers to perceive the remarkable contrast between the present and the past state of Irish agriculture.

The entire number of holdings in Ireland now is nearly 600,000, and from all of these returns have been obtained. The number of enumerators in 1858 was about 4,000: they were selected from the constabulary and Irish metropolitan police, and, as on former occasions, seem to have discharged their duties in a very efficient manner. The Registrar-General expresses his thanks to the landed proprietors, the tenant-farmers, the clergy of all denominations, and to the public press, for their continued and generous assistance in reference to the collection of these important statistics, the success of which is mainly due to the good feeling and confidence that prevail on this subject. This is creditable to all ranks and classes in Ireland, and certainly affords an example not undeserving of consideration in England.

It is pleasing to find what an alteration is taking place in the social condition of Ireland, from the extended growth of valuable crops and the large increase of live stock, adding, as these do, to the material wealth of the country. Emigration has indeed carried off large numbers, the population having decreased two

millions since 1841, and more than half a million souls having left Ireland within the last seven years. The price of labour has, consequently, advanced; and, as employment increases with an extending area under tillage, the means and prospects of the working classes of Ireland must be permanently improved. If those who have left have also improved their condition, as all reports would lead us to believe, the general result must, on the whole, be favourable.

In ten years the number of paupers in the work-houses and on the poor-books in Ireland has been reduced from 620,000 to about 62,000. The note circulation of the Irish banks and stock of bullion has doubled in the same period. Large tracts of land have also been broken up for the pasture by plough and spade. The holdings have been reduced about 60,000 in the ten years, showing a larger class of farms. In that period the cattle have increased 1,000,000, sheep 2,000,000, and pigs 500,000; and the present value of the live stock, proportionately to the population, is nearly £6 per head. The general total of land under culture with crops in Ireland now is one million acres less than it was in 1840; this is to be accounted for by the decrease of population, and the high ruling rate of wages; hence more attention is paid to stock-raising—a fact also shown by the increase of 400,000 acres in meadow and clover.

The land under wheat culture is also advanced again to the former ratio when the population was so much larger. There is one remark of the Registrar General, which does not speak well, however, for Irish farming. "As regards the condition of Irish agriculture" (he observes) "I beg to state that I continue to receive communications from various quarters relative to the pernicious growth of weeds, which is unfortunately so prevalent throughout the country, and an anxious de-

is generally expressed for some legislative measure to protect the improving farmer, who cleans his land, from the injury done to his crops by the winged seeds of noxious weeds, carried by the wind from the field of some negligent neighbour. Such a protection is afforded to the cultivator of the soil in some of her Majesty's colonies, and in parts of Europe."

The total area of Ireland, including bog, waste, roads, fences, &c., is 20,811,774 acres. Of this there was under culture in 1858, 5,882,492 acres, apportioned as follows: 551,386 under wheat, 1,976,929 in oats, 190,721 with barley, 16,489 with bere and rye, 12,876 under beans and peas, 1,160,056 in potatoes, 337,877 in turnips, 30,027 with mangold wurzel and beet-root, 33,107 with cabbage, 23,450 with carrots, parsnips, and other green crops, 33,441 with vetches and rape, 91,555 with flax, and 1,424,578 in meadow and clover, while 44,937 acres are under fallow or uncropped arable land. Let us now compare the progress made and mark the changes of crops in seven years.

ABSTRACT OF CEREAL CROPS.

	1852.	1858.
Wheat	353,566 acres.	551,386 acres.
Oats	2,283,449 "	1,976,929 "
Barley, rye, pulse, &c.	339,591 "	220,086 "
Total	2,976,606 "	2,748,401 "

ABSTRACT OF GREEN CROPS.

	1852.	1858.
Potatoes	876,532 acres.	1,160,056 acres.
Turnips	356,790 "	337,877 "
Other green crops ..	121,565 "	120,025 "
Total	1,354,887 "	1,617,958 "

The total extent in statute acres under the cereal crops and green crops in the middle of last year in Ireland was therefore 4,366,359 acres, showing a slight decrease of 34,866 acres as compared with 1852. It will be seen by reference, that the culture of wheat is extending, while oats, barley, rye, beans, and peas are declining. Potatoes are resuming their former ascendancy, while turnips, cabbage, and other green crops, on the series of years, show comparatively little variation.

The declining culture of flax is worth especial notice, in the face of the loud professions of profitable returns spoken of in Ireland, and the outcry for flax by the flax-spinners. The culture has made little progress out of the province of Ulster, and even there has been retrograding. The following figures shew the

total number of acres under flax culture in Ireland in each of the past seven years:

1852	137,008
1853	174,579
1854	151,403
1855	97,606
1856	106,811
1857	97,721
1858	91,555

The reason of this decline is, we are told, the unprofitable nature of the crop, which does not prove so remunerative as other crops, and hence its abandonment in many quarters.

The following abstract shows the quantity of live stock in Ireland now, and seven years ago:

	1852.	1858.
Horses	525,088	610,717
Cattle	3,095,067	3,671,594
Sheep	2,613,943	3,487,785
Pigs	1,072,658	1,402,812
Total	7,306,756	9,162,903

These figures indicate an increase of 85,629 horses, 566,527 cattle, 873,842 sheep, and 330,154 pigs, or an aggregate increase of 1,856,152 head of all kinds of live stock. Examining the returns for last year, we find that of the horses above two years old 431,420 were kept for agricultural purposes; and of the cattle, 1,633,378 were milch cows.

The total value of live stock, calculated according to the rates assumed by the Census Commissioners of 1841, viz., for horses £8 each, cattle £6 10s., sheep 22s., and pigs 25s. each, was as follows:

	1852.	1858.
Horses	4,200,704	4,885,736
Cattle	20,117,935	23,800,361
Sheep	2,875,337	3,336,563
Pigs	1,340,823	1,753,515
Total	28,534,799	34,276,175

The increase in value from 1852 to 1858 was therefore £5,741,376, a sum which represents the amount by which the farmers of Ireland as a body are richer than they were seven years ago. The cattle and horses are estimated, however, at a very low figure. Looking at the details and statistics generally, they are of a very encouraging and hopeful character, and there is every reason to believe that considerable and satisfactory progress is making in Ireland both in farming and cattle-breeding.

THE ENGLISH FARMER IN BELGIUM.

'Tis odd, but true, that though it requires more consideration on the part of the inhabitant of an island to overcome the fear of sea-sickness in leaving it, than in moving from one part of a continent to another, no nation are so fond of travelling as the English, and none less so than the French. Brussels is only four hours' journey from Lille, and yet how few dwellers in the latter place have ever been there! No *visiting* your passport is required; and for 7s. 4d.,

second-class, you are in one of the nicest cities in the world. There are 8,000 English here, attracted by its charming situation on a high hill, its healthiness, cleanliness, cheapness in living and education: liberty and order are to be found here too. The cheapest route is *via* Dunkirk; first-class boat, second-class rail; altogether, from London-bridge to Brussels, is only 18s. 7d. I know not another trip so cheap and pleasant; but a French passport must be taken in London.

Should any of my countrymen come without ladies, I advise them by all means to stop at Hazebrouck, halfway between Dunkirk and Lille, and, leaving their luggage there, hire a vehicle to convey them about seven miles to the Trappist monastery at Mont à Carr. There are about fifty of these extraordinary men who never speak except to say "*memento mori*," never leave the interior of the walls, and never touch animal food. It is on the summit of a very high hill, and from it you may see over the whole of Belgium, so far as the eye will allow—a perfect panorama, as it is the only mountain in Flanders. Thirteen small bed-rooms, very clean, are always ready for strangers, who are welcome, gratis, to food and lodging—bread and butter, vegetables, and excellent beer, which they brew themselves, but taste not. Any small gratuity the visitor may choose to leave is received, but never demanded. They farm their own land; all the labourers, smith, carpenter, &c., being monks; these, and four others, including the superior, are allowed to speak. I went, and stayed one night, and dined with four or five other strangers; was shown over all the premises, and spoke to the superior. Had I not, I should have left with a wrong impression, that all were ignorant bigots whose fanaticism could never be adopted by educated men; but to my surprise I found him evidently a gentleman, a handsome man of forty, with talent in every feature; mild in manner, but without the least appearance of a dejected, broken-hearted man, expiating some sin by a life of penance. It is an extraordinary sight to an Englishman, and well worth going from England on purpose.

Belgium is more subdivided than France. The labourers are many of them small farmers, or their sons; and it is wonderful how they obtain a living on such patches of land. Their cultivation and quality of land is about the same as in Flanders—sugar and gin being their best friends; but the latter is at a ruinously low price—4d. per pint retail.

They dig their potatoes, or rather pull them out with a "dung-hook." Certainly it is quicker, and less laborious, as the men do not stoop; and I cannot see it "pricks" the roots more, or so much as our three-tined forks. I am an old potato grower, but I never saw them so raised in England.

All are careful at intervals (as soon as it is dry enough to move) to collect the manure droppings on the grazed land, and they remain in heaps till winter, then to be carted in. It does not cost much, and must be good economy, as, if allowed to remain, the grass is some time growing through, and then not much relished by the cattle; and if it is spread, it soon is so acted on by sun and wind that half its value must be lost. I read, a fortnight ago, a letter, in *The Field*, from Grantley Berkeley, in which he says: "The insects which breed the wireworm deposit their larvae under these droppings." This is something new; but, if correct, it is an additional reason for their speedy removal.

The carts here are much longer and narrower than ours—the unimproved of centuries ago; but they have two appendages worthy of remark—they have sometimes long boards supported by eight or ten chains from

the sides of the carts, and give somewhat the appearance of immensely long barrels cut in two *lengthways*, and one of these halves suspended under the vehicle: the brick carts are always so; indeed, it forms the body of the cart, there being nothing on the piece of timber forming the side—'tis handy to load, and light and cheap, as no mortices weaken the sides, and no fronts, nor side-boards, nor top-rails are required. Of course, it will not do for any load requiring to be "shot" out behind.

The other matter is a substitute for a skid. The screw they have here they cannot put on these "hanging body" brick carts; they carry a long pole, which, on arriving at a descent, they chain at one end to the back end of the "side;" and bringing it *under* the nave *outside the wheel* they chain the other end very tightly to the shaft, thus giving it a pressure on the *nave* and also on the outside edges of the tire both on back and fore-part of the wheel. It acts well, but I should think unsafe from liability to break; but the poles look as if they had been in use some time. This on a pinch might be a useful hint to our carters with a heavy load and a weak horse.

As I have read in your paper of Nov. 1st a letter, being the commencement of a series on "The Social Condition of the Agricultural Labourer," perhaps you will not think it out of place if I mention a thing or two in connection with the labourer here, which we have not, which we sadly want, and which form here his greatest comforts—one is a cheap stove. It can be quickly moved and erected in any chimney, and in a new house does not require the latter, as they frequently have a vent for the smoke by attaching six-inch pipes to one another with mortar and to the wall (outside the house) with iron hoops, saving bricks and giving more space in the room—'tis quickly lit, and quarter-of-a-peck of coals (or wood will do as well) cooks the dinner, and a *hot* meal is produced at a very trifling expense of time or money—the two most valuable considerations to the labourer. To give some idea how small, I have had a basin of soup and bread at a large (but cheap) restaurant for one penny! and how much less cost when home-made! Vegetables they consume much more than us—mixing many sorts in the soup, and very palatable they make them. It must be wholesome, for more hearty working-men I do not wish to see. The pot just fits in the circular opening, so that no heat is lost.

It is a fact, that many of the wives of our men were before marriage cooks or housemaids in respectable families, and yet their household management is no better for their previous acquaintance with kitchen economy; partly it is not their fault. Firing is cheaper in England than here; but 'tis a heavy item, because we have not the means of making a *little* fire that will boil a pot; nor can the long time be spared which it takes in England; consequently, the most of their meals are cold ones. Now, in our own class, who can with pleasure, or pleasant looks, sit down to cold mutton two days' running! and what would be our happy winter's evenings without the fire! Then, can we be surprised at the labourer's relish for the beer-

shop? and may not also his cold food assist, perhaps, in stimulating his fondness for drink? Depend on it, the first move in endeavouring to make the farm-labourer sober and domestic is to give him warmth: 'tis next in importance to food.

Another simple thing is a goat. They are always tethered or in a pig-sty—out of harm's way; will eat almost any green or vegetable food, including the apples of potatoes, and give an astonishing lot of milk. I'm told—but it seems incredible—as much as six quarts per day of more nutritious milk than a cow's.

The third matter is more easily obtained still, and of all parts of clothing 'tis the most important to the man. His shoes—so dear—and here the sabots, wooden shoes so cheap, from 4½d. to 9d. a pair! I thought I must have made a mistake, and have just been to a shop to inquire again; and I weighed a pair of large ones: they were only 1 lb. each shoe. If not broken they last

a long time; in winter are warm, and always dry, and in summer cool; and, as to lightness, they are like a cork. Many gentlemen even have I seen with a pair of out-of-door slippers, just to pop on to look in the nag's stable, see what the gardener is doing, &c.; and little children of seven years of age I've seen running at their utmost speed over bad pavements in them. Are not these better than the holes at the toes, too often seen at home? Why on earth they have never been used in England as commonly as here I cannot see. Well, for a few pence any philanthropic man may shoe his poor neighbour; for a few shillings enable him to have all his meals hot instead of cold; and for another few set him up with a cow, which will supply all his family with milk, and yet requires not a yard of ground—as all the food may be found in the ditches and the offal of his garden.

Poste Restante, Brussels.

DEATHS OF CATTLE FROM FEEDING ON IMPURE COTTON AND LINSEED-CAKE.

SIR,—In this neighbourhood, during the last three months, there has been a great mortality amongst calves and sheep from feeding them on impure cotton and linseed-cake. One gentleman lost six out of forty fattening shearlings, and the rest of the flock became so much affected, that he deemed it prudent to dispose of them at a price much below their value, rather than run the risk of further mortality. When inspecting this flock in November last, I found the sheep, generally, looking very unwell. Those in which the disorder was most manifest congregated at the corners of the fold with their heads down and backs arched, frequently changing the position of their hind legs, and which in some instances were drawn up towards the body—thus plainly indicating abdominal pain; their breathing was much hurried; any movement appeared to increase their sufferings; they staggered in walking, and after going a few yards fell down apparently exhausted; the urine was of a dark colour, approaching to black, and the feces covered with blood and mucus.

I examined the bodies of several of the dead sheep. The stomach and intestines were intensely inflamed, and presented appearances which could only have been produced by some highly-irritating agent. The same gentleman shortly afterwards lost three calves which exhibited similar symptoms, and presented the like appearances after death. These animals had been fed on cotton-cake.

Twenty-two calves belonging to other parties have died apparently from similar causes, but these had been fed on linseed-cake. I procured portions of each description of cake, and on examining them under a powerful microscope, I found the cotton-cake contained a large per-centage of fragments of cotton-husk and cotton wool, quite sufficient to account for the deaths of the animals fed upon it; the linseed-cake also contained a quantity of impure material, consisting partly of seeds, which I was unable to identify, but not sufficient in quantity to account for the effects following the use of it, unless the impure matter was of a poisonous character.

The very extensive use to which cotton and linseed-cakes are applied as articles of food for cattle, seemed to me to

call for a more complete and scientific investigation than I was myself able to make. I therefore forwarded samples of all the cakes to Dr. Voelcker, the chemist of the Royal Agricultural Society, who has, with his usual kindness, forwarded me a very complete and able report of the result of his investigations, which fully confirms my opinion that the deaths of the cattle resulted from the use of them.

I subjoin a copy of the report and of the Professor's analysis of the cotton-cake, and I trust you will consider the matter of sufficient importance to insert this letter with the report and analysis in your next publication.

I am, Sir, yours very faithfully,

ISAAC SEAMAN.

*North Essex Veterinary Infirmary,
Priory House, Saffron Walden, Sussex.*

(COPY OF DR. VOELCKER'S REPORT.)

"SIR,—I have the pleasure of enclosing a copy of a careful and full analysis of cake No. 1 (cotton-cake), and beg to inform you that I have also examined the two other cakes which you sent me. As the quantitative determination of the amount of oil and other constituents do not appear to me likely to throw much light on the subject, I have confined my attention to the detection of deleterious ingredients in those two cakes, and may observe at once, that I have not been able to detect in either of them any organic or mineral poison, although I have carefully searched for most irritating poisonous substances.

"However, both cakes nevertheless may be prejudicial when eaten in quantity by young stock, for the examination to which I submitted them leads me to the opinion that both are very inferior, old, badly-kept oil-cakes. Both are very hard-pressed, and appear to contain more husk than good cakes ought to contain; moreover, the seed from which the cakes are made was evidently impure, for, notwithstanding the powdery state of both cakes, especially No. 3, I can find in them a good many foreign seeds. The botanical character of these weed-seeds I could not make out; all I can say is, there is no mustard in appreciable quantity in

either of the cakes, but amongst the weed-seeds there may be other pernicious seeds. We have no means to identify most vegetable poisons. Be this as it may, I am inclined to think that the physical condition of cake No. 2 and 3 is so bad, that young animals that partake of them freely will be the sufferers. Both are evidently foreign cakes. Will you kindly inform me under what name and at what price these two cakes were sold? You will perceive that I am of opinion that the cakes No. 2 and 3 may have done the mischief attributed to them; but that in the absence of any positive proof a reasonable doubt may be entertained whether or not this was really the case. I can speak much more decidedly respecting cake No. 1, for I have not the least doubt but that the cake has been the cause of the death of the sheep. A similar case has been brought under my notice within the last fortnight. A cotton-cake, very similar to the one you sent me, has led to the death of a bullock. The post-mortem examination plainly showed that the enormous quantity of hard and irritating husks in this cake caused an obstruction in the bowels, which brought on inflammation and led to the death of the animal. The case is reported in the *Gardeners' Chronicle* of the 8th inst.

"In addition to the full analysis, which proves the inferior character of your cotton-cake, I have made an approximate mechanical analysis, which demonstrates, perhaps, still more forcibly the cause of the death of the sheep. Experience has shown that the hard husks of cotton-cake are very indigestible, and accumulate in the stomach to hard stone-like masses, which produce virulent inflammation: cotton-wool, I think, is quite as bad if not worse than cotton-husk. Now, in your cake there is no less than 67 per cent. of husk and 4 per cent. of cotton-wool, and only 29 per cent. of meal. So large a proportion of useless and rather injurious material mixed with only 29 per cent. of

nutritious matter must be highly injurious for feeding purposes.

"In the best shelled or decorticated cotton-cake, which alone should be used for feeding purposes, and which is a highly nutritious substance, there is no appreciable quantity of cotton-wool, and only about 10 per cent. of husk. Cake like No. 1 is *totally unfit for feeding purposes*; and I congratulate myself upon having reported several specimens of cotton-cake similar to the one you sent to me, as too trashy to be given to an animal.

"Believe me, Sir, yours faithfully,

"(Signed) AUGUSTUS VOELCKER.

"I. SEAMAN, ESQ."

(COPY OF DR. VOELCKER'S ANALYSIS.)

COMPOSITION OF SAMPLE OF COTTON-CAKE MARKED NO. 1, SENT BY MR. SEAMAN, SAFFRON WALDEN.

NO. 1. CHEMICAL ANALYSIS.

Moisture	15.16
Oil	6.81
Albuminous compounds*	18.37
Gum, mucilage, &c.	23.32
Pure cellulose	29.93
Mineral matters	6.41

100.00

* Containing nitrogen 2.94

NO. 2. MECHANICAL ANALYSIS.

Husk, with a little cotton-wool.....	66.99
Meal.....	28.98
Cotton-wool.....	4.03

100.00

"(Signed) AUGUSTUS VOELCKER.

"Royal Agricultural College,

" Cirencester, January 18th, 1859."

WHY DO WE WASTE OUR STRAW, SO VALUABLE FOR FEEDING PURPOSES? HOW MUCH SHOULD IT BE WORTH PER ACRE?

SIR,—This is a vital question for agriculture. For many years I have been gradually more and more convinced that straw has a considerable value for feeding purposes, for which alone it should be used, in order to extract from it the largest profit.

It is true that, when I have propounded this notion in the presence of practical farmers, their shouts of laughter have testified to their disbelief; and I have smiled at their prejudice and miscalculation, in conscious conviction that they would gradually have to surrender at discretion.

The quantity of wheat-straw removed from an acre of well-farmed clay, where the average is 5 qrs. per acre, would be 2 tons per acre. Science has shown us that, ploughed in and considered as *manure*, its worth is but 9s. 4d. per ton; while, used as *food*, it will, if properly prepared, realize a value of 40s. per ton. Now what farmer would knowingly throw away £2 to £3 per acre, in so economic a business as farming? and yet, this is literally being done over millions of acres.

If it be denied that straw has a greater value as food than as manure, it would, by parity of reasoning, be desirable to compare the manurial and feeding values of oilcake, barley, beans, peas, hay, and roots.

Whilst my farming friends ridicule my dislike to ploughing

in straw, they would stand aghast at my proposing to them to plough in their barley-meal, linseed-cake, or other feeding material. But I can see no difference: the folly or error is in each case equal, and the loss comparatively as great.

Whence does this singular disbelief arise? Simply because the straw, in an unprepared condition, is not in an available condition as food.

I purpose to give a practical illustration of this question, by a statement of my own proceedings; but every one who would understand the question in its most comprehensive view, should study Mr. Horsfall's admirable papers on dairy management, in the Society's *Journal*. The whole feeding question may be considered as greatly developed by those papers.

The question of converting both our straw and our roots more advantageously than we now do, is a true breech-a-pocket question for the British farmer; nor are the public less interested in the more abundant supply of meat, which would naturally follow the more economic use of our straw and roots.

The general appearance of thriving animals is unmistakable. If, after feeding, they lie down contentedly, free from restlessness, all goes on well. Such is the case with my 10 young shorthorn bullocks, of Irish breed, about 30 months old, which were bought in at £9 each, in

They consume daily—

	£	s.	d.
216 gallons cut wheat straw			
6 do. rape-cake	0	2	6
3 do. malt-combs	0	0	4½
5 do. bran	0	0	5
Moistened by			
20 gallons of hot water (bean straw requires twice the quantity)			
300 lbs. of mangel-wurzel	0	1	4

In round numbers, they cost at the rate of 3s. 6d. per week independent of the wheat-straw. If I valued the wheat-straw at 40s. per ton, it would add 2s. 6d. to their weekly cost. The roots I value at 10s. per ton. The animals are in a fattening and growing condition, and evidently are advancing remuneratively. This we can judge of by their appearance, as I have not, like Mr. Horsfall, a weighing-machine for cattle. Nothing tests the value or force of food so soon as milking cows. I strictly adhere to Mr. Horsfall's proportions of food for mine; and the result is an ample supply of milk, and an *increase in condition*.

The food for each cow is as follows, daily:—20 lbs. straw chaff; 8 lbs. of hay; 5 lbs. rape-cake; 2 lbs. bean meal; ¾ lbs. bran; ¾ lbs. malt-combs; 35 lbs. mangel or Swedes. Cost (without straw), 7s. 7d. per week.

The whole question may be said to hinge upon the condition in which the food is administered. It must be *moist* any *warm*; and the animals must have proper warmth and shelter. As a general rule, this is not the case throughout the kingdom: hence much food is wasted or misapplied. Were I to give my bullocks the same quantity of cut straw in a dry state, they would not eat one-half of it; and, besides, they would be restless and dissatisfied. This I know from experience.

I will now describe my mode of preparation, and then calculate the cost.

I do not use the ordinary close steaming apparatus, but a number of cast-iron pans, or coppers, each capable of containing 250 gallons. These are set in brick-work, with a 4-inch space around them, each space connected with the adjoining one by a 6-inch earthen pipe.

Into these spaces, and around these coppers, circulates a portion of the *waste steam* from the engine, after having passed through the cylinder.

I should state that a close vessel of water, connected with the supply tank, is kept in a nearly boiling state by the waste steam before it passes around the coppers, and a vertical four-inch pipe takes away the steam after it has passed around the coppers; so that so long as the steam engine is at work, the steam flows around the coppers, after heating the close vessel of water, and then passes into the atmosphere.

The coppers are all sunk into the earth, so as to stand level with the floor. By this means, when an extra supply of food is required, it may be piled up in a mound, and kept hot for two or three days.

The straw chaff, *cut fine* and sifted, is thrown dry into the copper, twenty-seven gallons at a time, and then the proportion of malt combs, bran, and rape-cake strewed over it; then a pail of hot water (drawn from the hot water vessel close at hand) is thrown over it, and it is all incorporated by mixing with a steel fork, and *well trodden down*; then another twenty-seven gallons of chaff, with the other materials and hot water; another mixing and another treading down, until the copper is full and solid; and if extra quantities are required, it may be continued in the same way above and around the coppers, but it must be *moist and solid* (if too wet the animals will not eat it). The larger the mass, the longer it remains hot.

Practically, we find we can in winter manage if our engine only goes twice a week; but as a general rule we work it for grinding, irrigating, thrashing, &c., more often than that. The mass of subterranean brick-work absorbs the heat from the waste steam, and holds it for several days.

The heat so obtained costs you nothing, for it would be wasted in the atmosphere.

I think the time will come when farmers will turn it to several useful purposes.

Animals will eat rape-cake abundantly when so mixed and dissolved, but not when dry.

This is an admirable food for all sorts of farm animals, and it should be administered, more or less, through the whole year.

I should say that our roots are cut either by a Gardner or Bentall, and mixed in the manger with the warm steamed chaff. There will be no blowing, griping, or scouring with food so prepared, and the animals eat it as hot as they can bear it.

In my earlier career I reared first forty and then fifty calves, and sold them as fat bullocks, so treated, never having been off the boarded floors for two and a-half years, and never having had straw under them.

The ten bullocks I am now feeding are on sparred floors.

The cost of cutting a ton of straw into chaff, one-fourth of an inch long, may be taken at 3s. to 4s. The trials of chaff-cutters, as reported by the judges in the *Royal Agricultural Society's Journal*, show that 112 lbs. or more of hay could be cut in three minutes by steam power. It would be well, however, to double that time or cost, because we know on such occasions that everything is in "competing order," which could not be expected on a farm. Therefore, 2s. a ton for hay, or 4s. per ton for straw, would be a liberal cutting-up allowance by steam power.

If we are to consume all our bean, barley, wheat, and oat straw, we must keep our animals on sparred floors, or on burned clay, and we must invest more capital in animals, and shall make much more meat per acre. If a ton of straw will make 40 lbs. of meat, and if two tons of straw are grown per acre on our cereal and pulse crops, it would be four score of meat per acre over the whole of the cereals and pulse.

Oh! but where is your manure to come from, if you *eat your straw*?

Why your animal, by this mode of feeding, consumes 560 lbs. of rape-cake with every ton of straw. This is better than littering the yards by cart loads in wet weather, to sop up the water, and save some of the liquid manure which would otherwise be washed away by rain from untroughed roofs.

But what feeding property is their straw?

A good deal of hilarity was excited at our London Farmers' Club the other day, by my stating that every 100 lbs. of wheat straw, contained the equivalent of 15 lbs. of oil. Since then, I find I have understated the case, and that really each 100 lbs. of straw contains—see Morton's admirable *Cyclopaedia*, vol. ii, page 1153 (Voelcker's analysis)—seventy-two per cent. of muscle fat and heat-producing substances, of which twenty-seven per cent. are soluble in potash, and thirty-five per cent. insoluble.

The soluble fattening substances are equal to 18½ lbs. of oil in each 100 lbs. of straw.

In conclusion, I would recommend every feeder of stock to study Mr. Horsfall's papers in vol. xvii, page 260, and vol. xviii, page 150 of the *Royal Agricultural Society's Journal*. They will enlighten his mind, dispel his prejudices, and increase his profit.

If by his system of feeding 14 lbs. per week of meat and 3 lbs. of internal fat can be gained by each full-sized animal (and I am sure this can be done as an average), I know of no other system which will exceed it in result, or equal it in economy.

The consumption of straw, in the way here suggested, would produce a very great increase of meat, manure, and corn.

If supplies of this warm food were conveyed to sheep in our fields in cold and miserable weather, many losses would be avoided, and our turnips would make more mutton.

In order to provoke a discussion and examination of this subject, I send this communication to several papers, and shall probably enlarge upon it in some future papers.

Tiptree Hall, Kelvedon, Essex,
Feb. 28, 1859.

J. J. MEECH.

By Mr. Horsfall's mode of feeding you may get the manure without cost, and a handsome price for your straw and roots.

The following facts, deduced from Mr. Horsfall's paper, will show that 1,000 lbs. of swedish turnips, or 100 lbs. dry are worth 1s. 9½d. as manure, whilst

	s.	d.
100 lbs. of hay are worth	1	2½
100 lbs. of straw	0	5
100 lbs. of bean meal	2	6
100 lbs. of oilcake	3	1¾
100 lbs. of Indian meal	1	1¾
100 lbs. of locust beans	0	5

Here is an instructive and interesting comparison with a vengeance! A ton of swedish turnips are worth, as manure, 4s. per ton, or nearly half the manurial value of a ton of straw or locust beans.

Oilcake or rapecake are worth, as manure, £3 3s. per ton.

AGRICULTURAL IMPLEMENTS, AND THE PRIZE SYSTEM.

It is the effect of agricultural prizes to draw immediate attention to any new invention. If they were discontinued, how could a new implement or a real improvement be so well brought into notice? A prize at the Royal Agricultural Society's meetings at once attracts the eyes of all England to the new implement, and it certainly adds new honour to an old and tried one. If it were not so, why do makers run to such lengths to secure reward, and go to such cost in advertising and placarding the prizes they profess to disdain, and which some of them say "do them more harm than good"? It may be very natural that men who have arrived at the top of the tree by means of the prize ladder should wish to see that ladder removed. All honour to their skill and perseverance. But other makers, little men, are treading on their heels, and now and then surpass them. The prize system gives these small makers a chance; and if they can produce anything that is really useful as well as novel, a little prize card from the Royal Agricultural Society is the best and cheapest advertisement they can possibly have.

Notwithstanding that some able men contend that implements are better tried on the farms of spirited agriculturists than by any of these trials, we think there are few farmers who have the money or the inclination to buy all the new and untried implements as they come out. And, moreover, when machines are so proved to be *good ones*, it by no means follows that they are the *best* in the kingdom, because there is no chance of comparing their merits with others; whereas, at the competitive trials of the Royal Agricultural Society all the well-known makers compete side by side, and there is every chance for a fair comparison on equal grounds.

When certain stipulations and restrictions are pushed too far, mistakes will follow. The Society's endeavour to reduce the quantity of coals consumed by steam-engines had the effect of producing "racing engines," with a multiplicity of thin tubes for more easily generating steam. There was a great cry raised against the Carlisle award; and yet, under totally different specifications, the same firm again bore away the first prize at Chester.

It has been urged against the old system that many new implements were invented long before prizes were offered for them, and that some have been brought to their present perfection without competitive trials. All this is very likely: it is by no means desirable to restrict the limits of inventive genius, and it is extremely difficult to direct it into beaten paths; but still, all the newly-established implements have

certainly been encouraged and brought into notice by this system of prizes. It is not the mechanics, so much as the practical farmers, who are the inventors of the last few years; and the manufacturers of the old machines acknowledge with pleasure that their chief improvements are based on the suggestions of some plodding agriculturist. Chambers's water drop drill, Chandler's liquid manure drill, Huckvale's turnip thinner, Martin's revolving hoe, Phillip's root pulper, Chambers's manure distributor, Nalder's screen, Phillips's poppy extirpator, and a host of other implements, including the chain harrow, were all invented by practical farmers. For most of these prizes were offered by the Royal Agricultural Society before the invention was made public. The want was felt by the agricultural world; intelligent farmers taxed their ingenuity to supply the need, and the Society tested the merits of the inventions, and published their success.

If our competitive trials were abolished, we believe that those who thrive on puff and humbug would be great gainers. Farmers have plenty of those to contend against now a-days, but then they would be at a higher premium; as the man who could tell the best tale, make the grandest display, and attract the most notice, would be the best salesman at agricultural exhibitions. "The most attractive part of the show at Chelmsford," observes Mr. Howard, "was the machinery set in motion by the manufacturers, for which no prizes were offered." The most attractive, no doubt; but is that the end for which such meetings were established? The best-worded advertisement, the greatest noise, the busiest scene, the largest placard, the most elaborate self-praise, and the most energetic depreciation of another's goods, cannot be better tests of an implement's efficiency than the present censured system of competitive trials.

Yet there are many points urged by the implement makers and their Association of Agricultural Engineers with which we heartily agree. Trials at county shows must be a farce; local societies have not and cannot afford the means for properly testing machinery, and, if they offer implement prizes at all, they should be like those of the Norfolk Society, for the best collection, not for individual implements. Such prizes may contribute towards securing a good show, and cannot clash with awards formed on much better data than such associations can command. The only societies which should pretend to award special implement prizes are—The Royal, the Bath and West of England, the Yorkshire, and, of course, the Highland Society of Scotland, and the Royal Irish of the Emerald

Ise. That most flourishing and useful association, the Bath and West of England, have recently made a serious alteration in the usual programme. They have for years strongly upheld the implement trials with all their old imperfections; would every year give almost a superfluity of prizes, and now have decided on having no trials at all. Governments that will not grant reasonable reforms have often to bow before a revolution, and the Bath and West of England Society could no longer hold its ground against the united phalanx of the great implement makers. This step will probably lower the influence of this rising association, as far as the implements are concerned.

The memorialists to the Royal Agricultural Society prayed that the judges' report and observations might be published with the prizes. This would do much good. The farmer-judge is often a heavy writer, and would gladly be spared the trouble of furnishing a long report in January of what took place the previous July. A competent person might compile the judges' remarks, arrange a report, which, after being revised by the officials, might be published in time for the meeting. Such a report would explain the nature of the awards, and qualify some of the commendations, as well as direct attention to some good features in an imperfect implement. These suggestions, and the one for having two permanent foremen in the implement department at the shows to assist the judges, seem to us particularly reasonable.

We think that we have now considered the chief defects which are supposed to exist in the present implement prize system. Very many of the objections urged against it in the pamphlets of 1857 are objections no longer; the defects have been remedied, and the obstructions removed. Much yet remains to be done towards making the system perfect, and the longer, the more severe, and the more varied the trials, the more the public will appreciate them. But to abolish them altogether would be assuming that implements are perfect; and no greater evil can befall individuals, or a branch of industry, than a belief that they cannot be better, and that further improvement is impossible.—*Oxford Journal*.

[The following letter has been written on the above able series of articles, of which this is the concluding one:]

THE BATH AND WEST OF ENGLAND AGRICULTURAL SOCIETY.

TO THE EDITOR OF THE OXFORD JOURNAL.

SIR,—My attention has been called by some of my colleagues in the Bath and West of England Society to your article of the 5th, in which, speaking most kindly of the good done by that Society, you refer to our abandonment of prizes for implements in terms which seem to call for some explanation.

It is true we no longer give prizes on the award of selected judges, after trials conducted by those judges; but we have made full provision for the trial of implements at work before the public in the open field. We think that, the attention of intelligent farmers having been awakened to mechanical questions, the amount of work done, coal and power consumed, &c., those farmers are now the best judges of the gross result as a whole; and that their purchases and their experience will be a safer guide to their less-instructed neighbours, and I may add, I hope without offence, to some amateurs, than prizes awarded under conditions more or less artificial, and therefore so far deceptive.

It should also be stated, in justice to our Council, that although they resisted the changes pressed upon them some years ago, the recent change was the spontaneous act of the Council on a review of the whole case, taking into account the good done by the prize system in the infancy of agricultural improvement, and the evils apparently inseparable from racing trials when a single prize is to be awarded by a local Society.

The expediency of retaining mechanical trials at the shows of the Royal Agricultural Society is quite another question; although I think even then it is much to be regretted that a system of classified awards, on the principle advocated by Mr. Howard and Mr. Shuttleworth, has not been adopted; it can hardly be maintained that the difference between the ploughs and other implements of the first-class makers is so great that one ought to stand first, another second, and another third; or can so stand with the general consent of all competent judges, and under all ordinary circumstances.

If the first prize is only awarded because in such a field, with such a state of the atmosphere, and with such horses and ploughman, and it must be said with such or such judges, one maker beat another by half-a-neck, the judgment might be reversed the next day—and, if so, what is it worth? It amounts to proving that the winner is a skilful mechanic, with first-rate workmen; but it does not disprove the same conclusions as to his competitor.

We thought, however, that if we abolished the prizes it would not be worth while for a local society to stop half-way with the certificate system. We believe the public, aided by the Royal Agricultural Society, will be, in our case at least, the best judges.

Having adopted the principle of the Exhibition and Bazaar in the Agricultural Department, we propose to extend it to Arts and Manufactures, and anticipate a most interesting exhibition of articles of all kinds, interesting to the farmer's wife and family as well as to himself; and to the tradesman and to the artist, no less than to the agriculturist.

If you are kind enough to notice the fact, perhaps the North Devon meeting at Barnstaple, from the 30th of May to the 3rd of June, may be graced by productions from Oxford. Coventry and Birmingham have already promised beautiful contributions.

I am, Sir, your obedient servant,

T. D. ACLAND, Jun.

Sprydoncote, Exeter.

MIXED FEED.—A bushel of carrots and a bushel of oats are as good for a horse, at moderate work, as two bushels of oats—not because the carrots contain as much nutriment as the bushel of oats, for they do not; but they aid the digestive organs in a more perfect appropriation of the nutritive principles in both. When horses are continually fed on oats, much of the food passes undigested, and is a dead loss, except to the manure heap. So with sheep and cattle. Give them a few roots daily, and they will have a better appetite, digest their food better, and eat greedily coarse hay, that they would otherwise trample under foot.—*Ohio Farmer*.

THE FLOUR TRADE OF THE METROPOLIS.

The extent and importance of the corn trade of the kingdom and of the metropolis are too well known to our readers to require much special notice at our hands; but with the "daily bread" wants of a population, in London and its suburbs, approximating upon three millions, a glance at the London flour trade is not without its interest. The Londoners, of all classes, consume little, comparatively speaking, of any other grain than the best wheaten bread. And taking the ordinary accepted consumption of one quarter per head per annum, we have a demand of about 24,000,000 quarters of wheat for the supply of the metropolis.

It is difficult to ascertain the precise quantities arriving by land for sale in Mark-lane at different periods. But confining ourselves to wheat and flour, we have the arrivals by sea for the year 1857 to refer to. The imports in that year, coastwise and foreign, were 630,878 quarters of wheat, and 456,779 cwt. of flour, equal to 761,387 quarters of wheat. As compared with 1850, this shows a considerable decrease in the sea-borne imports of flour and wheat for the metropolis, which in that year consisted of 913,426 quarters of wheat, and 803,585 sacks of flour. The difference between these imports and the computed aggregate consumption must be of home growth brought up by railway, &c., from the country. To supply the bread of London there are, in the first instance, about 20 corn merchants, more than 500 corn dealers, 106 corn and flour factors, 20 granary keepers, 48 millers, and 2,600 bakers, to say nothing of various workmen and traders more or less identified and interested, such as corn chandlers, journeymen bakers, sack dealers, yeast merchants, &c.

Confining ourselves chiefly to the foreign flour, it is worth while to mark the progress of the trade, and to notice what proportion London takes of this. Liverpool is the chief port of entry, from its extensive American trade, the imports of flour there averaging 1,750,000 to 2,000,000 cwt. a year, while London only receives about a fourth of the aggregate supplies of foreign flour.

Since the abrogation of the corn laws, this country has become the great depôt to which exporting nations send their surplus. From the appended figures it will be seen that the average annual imports of foreign flour into the kingdom in the last seven years have been 3,541,000 cwt.

IMPORTS OF FLOUR AND MEAL INTO THE UNITED KINGDOM.

	Cwts.		Cwts.
1844	987,775	1852	3,921,635
1845	924,256	1853	4,662,899
1846	3,363,810	1854	3,678,299
1847	8,637,377	1855	2,522,106
1848	1,731,974	1856	3,970,100
1849	3,483,294	1857	2,178,148
1850	3,853,058	1858	3,856,137
1851	5,363,478		

The principal quarters of shipment in America are Detroit, which sends off about 700,000 barrels, Chicago 400,000 or 500,000 barrels, Oswego 300,000 barrels, Rochester 600,000 barrels, and New York a large quantity.

The exports of flour from the United States have varied considerably, according to the European harvests. In 1854 they were 4,000,000 barrels, while in 1855 they were only 1,200,000 barrels. Considerable shipments of American flour are made to Brazil, Australia, and other distant quarters.

In this country our tradesmen have perfect liberty of action, and our bakers are not compelled, as in France, by imperial decrees, to lay in, at command, a three months' stock of wheat or flour; but can suit their own convenience as to holding stock, and watch the course of the markets. Were it not so, the consumer would materially suffer, and the baking business be even more precarious and unprofitable than it is at present.

With respect to the general quality of flour met with in the London market we think there is little to complain of. Sour or damaged flour will not sell here. Even the cheap price baker knows the impolicy of mixing it up, for his customers are as shrewd in detecting the quality of his bread as he is in making it. Still, that there is an immense quantity of damaged and inferior flour shipped from American ports to different foreign quarters cannot be denied. Especially is this the case in Australia. A select committee of the Legislative Council of New South Wales has recently been taking evidence upon the state of the articles of food sold in the city of Sydney, and the colony generally, and the policy of an official inspector considered.

The inquiry appears to have been chiefly directed to the bad quality and adulteration of flour; and the revelations on this head are perfectly astounding. Its effect upon the public health are stated to be baneful in the extreme, and the great infant mortality of the city is chiefly ascribed to it. Some of the witnesses asserted that there were thousands of tons of damaged flour in Sydney and other parts of the colony quite unfit for human food, which was bought up by the millers for mixing with sound flour. Here is the evidence of one witness who had himself been in the trade:

Mr. Allin Hollinshed says: "There are occasions when immense quantities of damaged flour are used up. Two years ago, he was employed in looking for two thousand barrels of damaged flour to send home as a remittance, and found there was an immense quantity in the market. On applying to the mills to know if they had any refuse to sell cheap, they showed him several thousand barrels; and on his asking what they could do with it, when he was seeking to reduce the price on account of its supposed worthlessness for baking pur-

poses, he was told that it would all be used up in three or four months, and he believes it was used for human food. The usual plan is to put it through the stones, and it comes out apparently quite fresh. In many cases it is mixed with sound flour. Some of the American flour becomes acid, but that does not materially deteriorate it: the colour is always good, although there may be a few insects in it. But there is some which is musty and full of insects, from maggots an inch and a-half long downwards, and when that is put through the stones, they are all ground up."

One of the great difficulties in the transport and preservation of flour and meal, is their liability to ferment and become sour after a short time. Many a cargo has been rendered wholly worthless from this cause. When large quantities of flour or meal are packed together, as in flour barrels, the material heats and ferments, beginning at the centre of the mass, where no air can gain access. This is now prevented by using an open tube running lengthwise through the centre of the barrel, which circulates air, and prevents the meal or flour from heating. The flour acquires no musty smell or taste, however long it may be kept.

There is continual discussion and controversy going on in the American papers respecting the official inspection and branding of flour barrels. There are "fine," "superfine," and "extra" brands or barrels of flour; but what is the meaning of these terms? Do

they indicate the quality of the flour? That is the intention; but we are assured they do not determine it, and these marks are entirely disregarded by the dealers. What is a proper standard of the quality of good sweet flour? Is fineness the test of quality, or colour, or what? Definite information on this point would be of great use to the whole community, as there is an almost total want of knowledge regarding the quality of flour and the means of judging it by the inspector's mark. The grades of flour and the signification of the terms used differ materially in New York, in New Orleans, and in Montreal; and it would be very desirable if the same word described the same thing in every part of America.

The brand, if used at all, should be a warranty; upon the faith of it the purchaser deals and pays his price. It is assuredly important, and in fact necessary, for men sending flour abroad, to send it with some evidence of its having been officially inspected. The miller must be assumed to be acquainted with the different qualities of the flour he manufactures, and, when he brands a barrel of a certain quality, must be taken to have exercised his judgment, and aimed at the conclusion that the barrel so branded deserves to be described as branded. Upon the faith of this brand the purchaser deals and pays his price. If the brand is untrue, the purchaser is deceived. This has been held to be the law of the case in Canada.

THE OXFORD FARMERS' CLUB.

TESTIMONIAL TO MR. THOMSON, THE CHAIRMAN.

Notwithstanding the sound progress and increasing influence of the central body, our Farmers' Clubs generally have but an ephemeral existence. Many of them open promisingly enough; and some, indeed, with almost too much dash and spirit. They go on capitally for a year or two, have full meetings, interesting discussions, and—"then are heard no more." The simple fact is, that without some master-mind amongst them it is a matter of considerable difficulty for the same set of people to keep up the excitement of the thing. The subjects for consideration fail them; or, a man having descanted on his favourite topic, cannot often be induced to touch on another with which he may be less familiar. Again, the continual introduction of a little new blood is very requisite, while some occasional action in any business immediately connected with the neighbourhood has been known to do a deal of good. In a word, these local Institutions require some very nice management. It is easy enough to set them going, but the point is to retain them as the useful and becoming organs of the agriculture of their several districts.

Of course the secret of any such success is to be found in the earnestness with which the farmers themselves enter upon the experiment. A Club that looks

chiefly to the five-pound notes of Lord Lieutenants and County Members, with a *hip-hip* dinner once a year, cannot be booked for a very long life. Nothing is so enervating to such societies as the too active patronage of great people. We would not for a moment have the tenant bar out the country gentleman on these occasions. Let him come by all means, if he so wishes; but let the conduct of a Farmers' Club be in the hands of farmers. Let these find their own officers, and do their own work. They will take to it all the better when they divide it amongst themselves; and so let there be no hunting up of Lords and Squires for Chairmen and Presidents. One of the best signs of the London Club is that it has always a plain practical man in the place of honour; and we do not quite despair of the day when even the great show dinners of county Agricultural Societies shall be presided over by farmers, with county Members and county Magistrates right and left, if you please.

We have now for many years past had to notice the proceedings of a local club that has continued to live on with every credit to those in whom its management has centred. The Oxford Club is in reality what it professes to be—the representative of the Oxfordshire farmers. Nearly all the

best men of their class are identified with it, while its prosperity is as thoroughly in their own hands. At the recent dinner, Mr. Langston, a gentleman with some taste for the pursuit, admitted he had never been at one of the Club meetings; and the chairman, Mr. Morrell, in proposing the health of the Duke of Marlborough, confessed that he did not know till then that his Grace was "the Patron" of the Farmers' Club. This dinner in itself, in a word, told the whole history of the rise and progress of the Society. It was given in honour of one of the Club's staunchest friends and supporters, and the chairman of its meetings for some consecutive seasons. Need we add that this gentleman ranks no higher than those he presides over, or that Mr. Thomson of Culham is himself a tenant-farmer?

Terribly overdone as the testimonial system has been of late, we can honestly welcome such a demonstration as this. It was in every way significant. The agriculturists of Oxfordshire who, on Wednesday, gave a service of plate of more than two hundred pounds' value to the Chairman of their Club* were honouring no old friend or neighbour, with ties and associations, in perhaps, every other parish. It speaks well for the mutual subjection of our prejudices, when the midland counties can pay such a compliment to a Scotchman. To learn how he has deserved this of them, we cannot do better than turn to the toast of the occasion, introduced so happily and unaffectedly by Mr. Morrell:—

"As a few facts relative to the history and career of their friend Thomson might not be uninteresting, he would cite some. He had ascertained that he was born in 1800, at Broad Meadows, in Selkirkshire, and received his education at Melrose, near Abbotsford, where Sir Walter Scott, to whom Mrs. Thomson was related, lived. The relatives of Mr. Thomson were intimately acquainted with Sir Walter, and the great writer took considerable notice of him, and, having a high opinion of his capabilities, and anticipating great things from him, urged upon his friends that they should keep him strictly to school, and give him every advantage in the way of education. In consequence of this he was educated and intended for the Kirk; but his natural bent was for agricultural pursuits, which he liked best, and in which they all knew he had so well succeeded. Having made himself thoroughly and practically acquainted with farming operations of all kinds, under his father, he left home in 1825, and settled at Culham, in this county, and for a period of sixteen years managed the farm occupied by the late Mr. Jonathan Peel. On the death of that gentleman, in 1841, his family relinquished the farm, and Mr. Thomson took it for the remainder of the lease. On its expiration he continued it, and on the death of Sir George Pechell's agent (Mr.

Salter), Sir George gave the best proof of the high estimation in which he held Mr. Thomson by offering him the management of his Oxfordshire estates, and he fulfilled that duty to the great satisfaction of his employer and the tenantry until the estates were disposed of in 1856. It would thus be seen that Mr. Thomson had spent thirty-three years in this county, and no man could say a word against him, and he (the Chairman) did not think a more honest, straightforward man ever existed. In 1851, Mr. Thomson, who had been one of the original promoters of the Oxford Farmers' Club, succeeded to the high position of President of that body, and had been re-elected every year. No one had done more to uphold that club, for he had enlisted nearly half its members, had been constant in his attendance, and given to them and the county at large the benefit of his great experience and sound practical advice. For many years a most intolerable nuisance existed on Carfax, where every week the farmers assembled, and all the business of a corn market was transacted, while they were exposed to all weathers, and to the chance of being run over. In 1851, Mr. Thomson was the first to make an effort to remedy this state of things; for a meeting, over which he presided, was held at the Roebuck Hotel, when it was agreed to memorialize the Market Commissioners to grant the use of the new avenue where the Corn Exchange is now held. Mr. Thomson was so anxious that the experiment should be tried, that he very liberally and spiritedly offered to pay down the first year's rent; but that was rendered unnecessary, because the superiority of the situation over that of Carfax was so manifest that sufficient funds were raised by subscription to establish the Corn Exchange there. There was one more act of Mr. Thomson's which he felt bound to mention, although it might be known to some, and it was one which hardly one man in ten thousand would have done. Some few years ago Mr. Thomson became a shareholder in a Joint Stock Bank at Abingdon, and, not being satisfied with the state of its affairs, he obtained an additional number of shares to become a director, and to have a voice in its management; he soon found that it was a failing concern, and then went vigorously to work, and succeeded in stopping it, and getting its affairs wound up. The result was that there was a considerable deficiency, and many who had deposited in the bank the hard earnings of a long life would have been reduced to beggary had not Mr. Thomson come to the rescue. To his infinite credit, he declared that no one who had deposited money in the bank on the face or strength of his name should be a loser, and that his last rick and his last shilling, if necessary, should go to make up the deficiency. He rejoiced to say that every depositor was paid in full; but he grieved to add, that Mr. Thomson lost above £2,000 by the transaction."

* The plate bore this inscription:—"Presented to WILLIAM THOMSON, Esquire, of Culham, by upwards of 200 subscribers in this and the adjoining counties, and elsewhere, to testify their appreciation of his public services as President of the Oxford Farmers' Club, and Chairman of the Oxford Corn Exchange, and of his efforts to advance the general interests of agriculture, as well as the deep-rooted respect for him in his private capacity. March 9, 1859."

There is a good moral in this history, that tells equally well for the Club and its Chairman. Let other similar Societies learn from it how they also may flourish. Let them bear in mind the men they have to depend upon, and how the character of a President

will come to be reflected on an institution itself. But the Oxford Club has from the first done wisely in this way. It started under the auspices of Mr. Roberts, of Waterperry, one of the most straightforward and worthy specimens of the English yeoman we ever had the good fortune to meet, and who has a fair share with Mr. Thomson in the well-merited honours of this occasion. The attendance here was quite in character. In the hundred-and-fifty who sat down to dinner there was a county magistrate, Mr. Morrell, in the chair, a city member, Mr. Langston, by his side, one clergyman, the Mayor, with two or three of the citizens of Oxford, and then the great body of agriculturists and brother-farmers. This company alone would go to show how genuine and hearty was the feeling with which the proposition had been received.

We look upon the Oxford Club in many respects as an example for others. Its discussion-subjects are generally not only ably considered, but equally well timed. It has a really working-committee, backed by

a very efficient secretary, and it is so gaining a gradually-increasing hold on the county. But with all these advantages it has one very weak place. The Club has actually no home. Its members are simply a body of peripatetic philosophers wandering up and down the streets of the city, and jostling the gownsmen for side and place. The meetings are held here, there, and everywhere; and we were just in time to hear the General Meeting declare it was best "to let well alone." Surely the Society has now a status above this, and even a room or two for the especial use of the members should not be altogether beyond its ambition. There are local Clubs, such, for instance, as the Newcastle, which already have the accommodation; while, to show what others think of it, we were told by a Berkshire man, as we travelled down, that "the worst of it was the Club went about from one public-house to another." In these days the cause of agriculture should rise superior to the concomitant attractions of a pipe and a glass.

THE INTRODUCTION OF STEAM-POWER INTO COMMON FARM PRACTICE.

The chief topic now under discussion amongst the farming community is the modern introduction of steam power into ordinary farm practice; and the advocates of the different systems of culture, or application of the power, are alike equally sanguine as to the important change and ultimate benefits. That this gigantic power will be so modified, so simplified in its general character, as to become applicable to the common routine of modern farm practice, I do not entertain a doubt—it is merely the work of time and engineering and mechanical skill.

I shall not attempt to compare the various systems of cultivation, or even allude to them further than to show what may be the probable alterations in the management of those farms where this new system will be introduced; and the power of steam is adopted in lieu of horse and manual power whenever it can be found practically beneficial. My own impression is that the order of culture will be so surprisingly improved, that the enhanced produce it will achieve will be so considerable, that the inducements continually opening out before the steam-power farmer, of still greater results, will so satisfy him, that he will be readily disposed to employ both more horse and more manual labour, rather than displace either one or the other—in fact he will be glad to retain every horse and man he now employs, in addition to the power of steam.

Take an arable farm of 350 acres, of medium quality and fair depth of soil—a useful loamy soil; begin your steam cultivation immediately after harvest, or rather during harvest, or so soon as the implement can be put to work after the crop is reaped. The whole breadth of the farm under corn cropping would be wonderfully advantaged by being broken up and deeply cultivated during the closing months of autumn. The power of

steam, in addition to the team labour, could alone achieve this grand desideratum. Here, then, is profitable employment for every horse and man, which I will call occasion number one.

Then comes the wheat-seeding, and occasional labour in various ways. The farmer requires, first, seed-wheat; secondly, a customary lot for sale to replenish his purse after an expensive harvest, and to meet sundry payments: these must be provided for. The teams are therefore engaged in the several processes of business, while the steamer is thrashing the wheat. The team labour will consist of the harrowings and the scarifyings of the deeply broken-up soil effected by the steam-plough and cultivator, the cartage of collected weeds and rubbish, the manuring of the land intended for wheat, the preparation of the seed-bed for the wheat-sowing, and the subsequent completion of the wheat seeding. At the same time also come in season the taking up of the potato crop, the securing the man-gold crop, and all other root crops not generally grown; besides many collateral and necessary jobs, such as the marketing and the delivery of corn, the obtaining supplies of manure, the carting of field stacks and stubble to the fold-yards for winter fodder and lairage: these and similar engagements employ much team labour. This I shall call occasion number two.

If there is during the year to be a dormant time, it will be during the severer part of the winter months; but it will be found that the new and novel courses of culture incident to the adoption of steam-power will provide much extra work for the teams and labourers. For instance, all lands requiring subsoil drainage must be so drained; this of course involves cartage to a considerable extent. Then all lands having high-backed ridges will require levelling; all borders and ditch banks, &c., will require carting

into the hollows and furrows; then all over-grown hedge-rows and rootings will have to be carefully dug close, to give room for the steam-ploughs, and prevent harm and breakage. Then comes the cartage of lime, chalk, and manures from fold-yard, where required. I also anticipate a large increase of cattle and sheep required for the consumption of the root and straw crops: these will during the winter months require a large amount of cartage: the roots from the fields to the fold-yards, the manure from the fold-yards to the fields. I also anticipate a large amount of field labour will be done by steam-power during the winter—such as trench-ploughing in fine weather, subsoil ploughing, and the ordinary ploughing of such lands as were unavoidably left over in the autumn, or were required for some specific use. Then there are the winter thrashings—the chaff-cuttings; for I am sanguine enough to think that most of our cattle fodder will be ultimately cut into chaff. Then the cake-breaking, turnip-cutting, pulpings of mangolds and other roots—all these, I consider, will be greatly extended, owing to the enhanced produce of the farm by deep steam culture; so that from one source of employment or other, the teams will not have much idle time during the winter.

But spring is coming in, and all attention must therefore be given to get in the spring crops well, and in good time. The steam-ploughs and cultivators are again at work; and as there is no treading by horses in the culture, the land will work freely, and is soon ready for seeding; this is put in by the horse teams with the greatest expedition; so that the spring crop has the whole spring to grow and luxuriate in. This is very different from the old course, which generally occupies the whole spring up to the month of May before all is completed. Moreover, the land has had the advantage of a thorough pulverization, which as it disintegrates the ammoniacal salts, &c., in the soil, adds much to its fertility, and produces the more abundant crops; and in a way which could not be accomplished by team labour. This is more particularly the case with the autumn-worked soils: the more they are cultivated in suitable weather, the more calculated are they for producing the most abundant crops of wheat. The spring seeding then I call occasion

number three, when all team labour finds full employment.

We now come to the fallowing and the putting in of fallow crops. The ways are various; but all concur in the view that fallows cannot in reason be too highly worked. We have broken them up in the autumn at great depth; some we have laid up for the winter in trenches. These we respectively desire to cultivate at great depth, and very frequently, in suitable weather: for this purpose all our power of steam and team power is required. The steam power we would employ to cultivate deeply; the team power in the top scarifyings, harrowings, rollings, and draggings, and subsequently in the manuring, ridging, and nicer work of seeding. In carrying on these various operations simultaneously the whole strength of the farm will be more than requisite, and it will be found to yield a far more profitable return than the tardy slow process now generally followed, to the manifest want of much manure, and much valuable time in its growth: besides, if a fallow crop, *i. e.*, mangolds, turnips, &c., is put in quickly and together, it will all grow up more steadily and safely. The fly has no power over a large field growing all at once; but after the old fashion these pests can find food at one side of the field which is first sown and fresh come up, and so feed their way to the other as it comes up, to their liking. The fallow-seeding then I call occasion number four.

Well, now come hay and corn harvests, and the clearing of the fold-yards and preparations for these harvests. The horse-hoings of the fallow crops, and the little necessary works and improvements generally left for completion between seeding and harvest, occupy the teams. I need not say that the harvest occupies all hands and all teams. This I shall call occasion number five.

Now, I think I have fairly shown that the adoption of steam-power will not necessarily displace much other labour; but if it is to be carried out in its full efficiency, I believe the farmer may best look upon it as a great and powerful auxiliary, and which he ought not to be slow in adopting. It will, he may rest assured, better execute his harvest work than it can be done by horses, and will always make him in a great measure independent of our fickle climate, so that he will never lose his season if he only acts judiciously.

THE HARD TIMES—AND HOW TO MEET THEM.

There's no doubt about it. Expenses must be cut down. Sixpence must be spent where a shilling was spent before. The pony chaise about to be ordered must be dispensed with; and that cheap pony, now grown very dear, must be sold: he is eating his head off. The luxuries must be lopped off. Dress, where it can be, should be simplified. The relaxation of the chase, with its attendant expenses, needs strict limitation. That hunter, clad in fine wool, and standing at the door of his lordly box to sun his nose in the beams of a January

noon, represents, beyond the cost of his own keep, a neglect of business quite incompatible with the pressure of hard times like these. The greyhound, that offers his cold-nosed salute to your hand, implies the same fact; and that group, composed of a ruddy boy, setters, and gun (a pretty picture in itself), awaiting the appearance of the young master, presents to the calculating eye an unwarrantable item in the year's expenses.

It is of no use saying that we cannot do without these things; we must. Men in trade toil on and on and on,

and work the year through with scarcely any respite. You may count up their holidays, and often times they will not together amount to one week out of the fifty-two. How seldom is it that they go forth to meet the sun upon the grassy knoll! What know they of the ever-changeful sky; of the ever-beautiful variety of light and shade? They are not acquainted with the different flights of birds, nor with the mysterious language of the wind; they are entirely ignorant of the thousand delights that minister to the pleasure of the farmer. And this arises from no disinclination to enjoy them; no, nothing of the kind; but from a deep sense of duty, that keeps them plodding on, in the race of competition, until they secure the prize and the leisure to enjoy it.

Well, it should be the same with the farmer. It is absurd for him to expect success, and yet to take one or two or three days' holiday out of the week; quite absurd. An exact and constant supervision needs the devotion of a man's whole energies. And who will contend that a less amount of attention is sufficient? Many a man who has failed in England has gone abroad, and sent home wonderful accounts of a farm bought and paid for and well stocked in an incredibly short space of time. And those who read these reports generally fail to extract from them the lesson they contain. The man thrown upon his last resources puts forth as it were almost the energy of despair upon the materials before him; and that indomitable perseverance which demands, nay creates success, receives it. Had the same effort been employed at home, the same result would have followed, though perhaps, from certain accidental circumstances, in a limited degree. The same measures that will succeed in Australia, depend upon it, will succeed in England. And were we disposed to establish our households upon the same dimensions as our emigrant brothers establish theirs in the backwoods of America, or the bush of New Zealand, we should find a more considerable balance on the right side than is now frequently the case.

And while upon this subject, it may be well to say that amongst us there does exist too great a disposition to depute our authority as masters to the hands of farming bailiffs, and to enjoy the leisure that results to us from the practice. This course we have in many cases observed to arise out of positive indolence, or disinclination to attend to practical pursuits. Sometimes it is downright cowardice that prompts the step. We had rather that another hand exerted the pressure on the labourers than our own; we lack the courage to exact the tale of work, or to enforce the reduced wage. But while the master thus saves himself, he is called upon to pay a sufficiently heavy tax in another direction, for those who have tried it do not give a very satisfactory account of the deputy system. Where a man's business is so extensive that he absolutely needs help, the case is quite different. We all remember the fable of the

Stag in the Ox-stall—intended to convey the moral that no eye is like the master's eye. Sir Charles Napier, writing from Cephalonia, understood it well enough. He said, "My predecessor thought, as half the world always thinks, that a man in command has only to order, and obedience will follow. Hence they are baffled, not from want of talent, but from inactivity; vainly thinking that while they spare themselves, every one under them will work like horses."

There can be no question as to the necessity that does exist, and will yet further exist, for retrenchment. Live stock has already fallen from 20 to 30 per cent. in value; and the average price of wheat last year shows a reduction on that of the year previous, of 12s. 6d. per quarter. But while we acknowledge this necessity, it is quite possible for us to take a course that will not be fraught with desirable effect. We may, for instance, follow the example of people in high places, who, when retrenchment is demanded by the nation, make a vigorous reduction in the artisans employed at the arsenals, fall upon the laborious postmen, and lower the salaries of inferior officials. My Lord High Treasurer still retains his salary as Chief Snuffler to her Majesty, and no one would think of disturbing the Most Noble Marquis in the hereditary possession of the title and fees pertaining to the Chief Falconer to the Crown. And the farmer, we fear, commences his retrenchment in like manner, at the wrong end. Not until he has scrutinised the labourers' list; not until he has dismissed as many workmen as he possibly can, and reduced those that remain to the lowest pinch, does he generally give a thought to the curtailment of personal expenses, the abandonment of costly field sports, and a more undeviating attention to business.

We are not going to say that there is no reason in reducing wages at certain times, or in dismissing workmen at certain seasons; but we do say, that when men rush to this course as the first and only means of averting calamity, their selfish policy carries the seed within it of a great retribution. Depend upon it, the letters that are flowing into this country from fathers, brothers, and friends, who are successfully carrying out their plans in our thriving colonies, will not be as seed falling on intractable soil. The ill-paid and the unemployed will not turn a deaf ear to the solicitations to "come," and an increased exodus may be expected, the effects of which will not be fully realized until the grain is shaking in the field.

While, therefore, we endeavour very properly to meet the pressure of the times, let us not begin at the wrong end. When we have lopped off our luxuries; when we have put into play all our energy, and discovered all the secret resources within our land, it will then be time to let the pressure of hard times be a little more felt by the labourer.

THE HORSES OF THE CAPE.

The Cape Colony, as Mr. W. Hawes told the public at the Society of Arts, on Wednesday, March 9, in a very excellent paper on "its products and resources," now exports other things besides wool and wine.

If it has taken the start even of the leading Australian pastoral colony in its clip of wool, it is also now occupying a prominent position in the shipment of horses for the Indian cavalry. Due attention is also paid to improving the breed of cattle. The breeding of horses and sheep has long received the greatest attention, and very shortly the live stock of the Cape Colony will bear comparison, head for head, with that of any colony or older country.

We called attention recently to what was doing in Cape wools—in the improvement of the breeds, and the character of both fleece and carcase; and especially in allowing the wool to attain a full growth, instead of shearing half-yearly. When we find that the colony last year exported 18,000,000 pounds of wool, that it possesses at the present time about 7,000,000 sheep, 500,000 head of cattle, 150,000 horses, and 1,500,000 goats, it certainly holds the most prominent position in the quantity of its live stock of any of our colonies.

But it is with its horse-kind that we propose to deal in our present remarks, because an important and growing trade has sprung up recently in the supply of Cape horses for our troops in India. The Cape is more favourably situated for the shipment of horses across the Indian Ocean than Australia, and the losses on shipboard from thence have been less. Moreover, there is a greater number to select from; and, but for the heavy mortality a year or two ago from the horse-sickness, the quantity of horses in the Cape Colony would have been even larger than at present. Not many years ago the Cape farmers had to import horses and mules from South America: now they are able to export horses to Calcutta. Certainly the Cape horse is small, and would not satisfy the eye of an English selecting officer; but his endurance during the longest and hottest day surpasses that of almost any other horse. A considerable number of the best horses of one of our cavalry regiments which were sent from India to the Crimea, and which arrived there in good condition, were imported from the Cape a few years before. It has been well suggested that by crossing the native breeds of the Cape with English thorough-bred stallions the sort might be greatly improved. The colonists may depend upon a constant demand from India so long as they take care to maintain the character of their horses; but the transport to India is too costly to warrant one unsound horse being shipped. About 4,000 Cape horses were shipped last year, valued at £133,000. This is a fresh field for agricultural skill and capital which the prudent, persevering, and never-receding industry of the Cape farmer will no doubt

enlarge and improve, as has been done in every other department of his rural kingdom.

An Indian remount agency has now been permanently established at the Cape, and at least 5,000 horses a-year may readily be disposed of.

It is very desirable that the statistics and resources of our colonies should be more generally known at home, for very much ignorance still prevails, even in official quarters. As an instance of this, we find recorded in our last Cape advices—At a dinner given at Cape Town, to Col. Apperley, the selecting officer appointed by the Indian Government, his excellency Sir George Grey stated that when first the intelligence of the Sepoy mutiny reached the Cape, he felt satisfied in his own mind that the demand for horses in India would be immense, and that the whole efficiency of our army in that empire would depend on this want being promptly supplied. And knowing, as he did, the vast capabilities of the colony, he wrote to the Governor-General, informing him that they could supply from hence the Indian army with horses, and that he would procure 500 at once and ship them. He further added, that there really was no end to the number this colony could supply. "When the Indian authorities received that letter," continued Sir George Grey, "they were altogether surprised, as they had no idea that the Cape of Good Hope could supply anything like 500 horses. We then received almost immediately, or at least shortly after, authority from England to procure horses for India, and so we set to work. The order that came out was to procure 1,000 horses for India; and in thus asking for 1,000 to be sent, they evidently considered they were asking for what they had hardly a right to expect, and that they were throwing on the government here a task which it would be hardly able to fulfil. Now, I may just advert to the computation which I made of the number of horses which could have been sent on to India. I believed that 3,000 horses could have been supplied instead of 1,000. I was so satisfied of the capabilities of the colony that I sent home this computation and asked for further instructions, as I believed that 3,000 horses could be procured and shipped."

The result of this first effort is surprising, so far as the colony is concerned. They have de-patched upwards of 50 transports with troops, and more than 4,000 horses. The employment of so many transports must have been of immense advantage to the shipping interest, and consequently it must have given an impetus to trade. The purchase of so large a number of horses has also given a stimulus to the breeders, and exercised a favourable influence on the agricultural districts, which will be abiding. Still further advantages will redound to the horse-breeders of the colony if they rear a superior class of animals for future shipment to India. The farmers

were paid for them in ready money, which of course gave a stimulus to agricultural and pastoral pursuits throughout the whole colony; and there was also paid to the farmers £38,000 for forage for the horses thus supplied.

Another great fact worth notice is, that whilst from Australia to India the casualties to horses on shipboard have averaged not less than 40 per cent., and from South America 60 per cent., the casualties on horses sent from the Cape have not hitherto exceeded four per cent.

There is one experience which the Cape farmers have learnt by the terrible mortality from successive epidemics in horses, cattle, and recently in sheep; that is, that something more is required for permanent health and strength than the rude cookery of nature. In the Cape colony, for obvious reasons, most animals, including horses, have been left to what they could pick up of natural grasses in the field. These are very abundant, and very nutritious for a large portion of the year; but to build up a hardy and strong animal, some care must be bestowed upon his food. It has been well said, that "the value of a horse goes down his throat:" that is, his bone and muscle, his powers of endurance, spirit, and temper, represent the quantity of his food, and the air he has breathed, and even the food of his mother while nursing him.

We have, on previous occasions, recommended the

introduction from time to time of new breeds and new animals into our colonies; we are therefore glad to see the Cape farmers are thinking of exchanging benefits. It is suggested that the next time a ship starts from Table Bay freighted with horses, she should bring back a cargo of Mysore draught oxen. It would not be a bad thing to put a little more activity before the waggon wheels. The bullock waggon is the chief mode of conveyance for families moving, and merchandize, accomplishing 20 miles a day. It is in part a travelling hotel, carrying beds, provisions, and cooking utensils, rendering you quite independent of any accommodation on the road. If by the introduction of a certain amount of more sprightly bovine blood into their teams the traveller and the "trekster" in Southern Africa could manage a mile an hour more than they do now, it would be a great blessing. The Mysore ox would very likely suit the best for the Cape, inasmuch as its native table-land is lifted up into a more proximate temperature than is the general level of India. It is not much less in size than the general run of African oxen: it is deep in the chest, roomy in barrel, fine in the legs, straight-horned, and sleek of coat. The prevailing colour here is a light cream colour. It is the carriage ox—the Arab among bullocks, and will travel six miles an hour. An interchange of this kind may do good, especially in a colony where oxen are the chief beasts of draught.

INFLUENCE OF NITROGEN ON CROPS.

MILBORNE ST. ANDREW FARMERS' CLUB.

A meeting of this club was held at Milborne St. Andrew on Wednesday evening, the 20th of October last, to discuss the subject of "The influence of Nitrogen and its compounds on Vegetation," introduced by Mr. W. C. Spooner, the eminent Agricultural Chemist, of Eling, near Southampton. There was a goodly attendance of members.

Mr. W. C. SPOONER said: Mr. Chairman, and gentlemen, the subject on which I have to address you is, I believe, as your Chairman has said, "The influence of Nitrogen on Vegetation." Now, it is very desirable, speaking of the subject of manures, to have some little separation of topics; because the importance and influence of the phosphates, and a few others, are now felt to be so great, that the moment you begin speaking of manures, you are sure to talk about phosphates and superphosphates; and the chances are, that being considered still more important in a district like this, the subject naturally branches off in that direction, leaving little opportunity for discussing on that occasion the proper subject of the evening.

With regard to nitrogen, when I had the pleasure of introducing the subject to you before, you will no doubt recollect that I then showed you what were the various gases that composed animal and vegetable bodies, or, in other words, of which they were built up; it will, therefore, be unnecessary to do so on the present occasion, from your being aware of these components, and not having forgotten the observations which were then made on the subject. In short, I shall speak chiefly of nitrogen, and shall say but little of the three other organic bodies that enter into the structure of the earth, and the animals and vegetation existing on the earth. Nitrogen exists in the atmosphere to the extent of four-fifths of its entire bulk. It is a body of but little activity, and serves principally the purpose of diluting the oxygen of the air to some considerable extent. You all know that when a candle is burned under a close glass the light soon goes out. Water ascends and condenses on a portion of the glass, as part of the confined air is burned, and the remaining part

consists almost entirely of the nitrogen which was in combination with the oxygen consumed. It serves in the air, then, to dilute the oxygen, whose powerful influence would otherwise burn up all animal and vegetable bodies, and, in fact, cause our planet to disappear from space after a brief conflagration. Therefore it is that the nitrogen of the atmosphere is of such immense importance. Yet it is a singular fact, and, indeed, I know of none which startled chemists so much when first discovered, that this apparently innocuous, weak, and harmless gas is the peculiar element composing animal bodies, flesh, and all bodies capable of supporting and nourishing flesh. They were surprised when it was discovered that nitrogen was the gas peculiar to flesh as distinguished from fat. Gluten, as distinguished from starch, was that part of the food which is capable of sustaining flesh and building up fabrics distinct from that which is merely deposited as fat, which serves the purpose of keeping the body warm, or of acting as fuel in the consumption by it of the oxygen of the atmosphere in the lungs, and thereby supporting animal heat. The question is, "Nitrogen, what is it?" "Ammonia, what is that?" We are much more familiar with the word ammonia, by which we understand at once that pungent gas which largely escapes from our dunghills. Its strong pungent smell is chiefly due to the carbonate of ammonia constantly escaping from it. Ammonia is composed of hydrogen and nitrogen. Hydrogen is the gas which forms water—nitrogen, as already noticed, the gas which composes four-fifths of the atmosphere. By weight, three parts hydrogen and fourteen parts nitrogen form ammonia. Thus, when an analysis is given, fourteen parts of the constituent proportions of ammonia consist of nitrogen: the other constituents matter not; and it is the more correct when speaking of that which relates to food or manure as nitrogen, because, although the greater part of that which escapes is in the form of ammonia, other parts exist in it as a compound capable only of being converted into ammonia. You are all familiar with ammonia. Here is a little in a liquid form (*pouring it out*); any gentleman who may heartily sniff it (*passing it round*) will feel it to be strong. (*Laughter from the successive experimenters.*) Here also is some chloride of ammonia; that is, ammonia fixed by hydrochloric acid, commonly called muriatic acid; in passing it round, it will be found to possess none of the smell of ammonia. If, however, we mix a little lime with it (*mixes*) we shall presently see that this renders free the

ammonia; and, in passing this round, you will have an opportunity of testing the difference between ammonia in combination and apart. We possess no evidence to show that nitrogen, although the ultimate and important element so essential in manures and in animal bodies, can be directly assimilated by plants. Otherwise it would soon perform a revolution in agriculture. Peruvian guano would no longer possess a monopoly, and the price of ammoniacal manures would cease to be what they are at present. They would be no longer of value, because the atmosphere, which contains no less than eighty per cent. of it would give abundance of this valuable ingredient. But it seems to be the design of Providence that man should only earn his bread by the sweat of his brow; and that only through the means of his labour and intelligence shall the fruits of the earth be raised. Providence, therefore, steps in and forbids the use of this important element, existing so largely in the atmosphere. It is necessary that nitrogen, to be of use, should assume another form, and we have no evidence to induce us to suppose that the nitrogen of the atmosphere can be directly assimilated by plants. You are aware that carbon forms the great bulk of vegetable bodies, such as the root crops; it is derived principally from the atmosphere, partly from the soils, and very little from manure. It is principally obtained, I say, from the atmosphere; for although it exists only in the atmosphere as carbonic acid to the extent of one thousandth, it is yet sufficient to build up the mighty forests that cover the face of the globe. Plants, by a very simple plan, imbibe the carbonic acid of the atmosphere, giving off the oxygen again, and converting the carbon into their own structures, which are not derived from nitrogen. When nitrogen becomes the food of vegetable bodies, it is more common for it to unite with hydrogen and take the form of ammonia. The effect of mixing two bodies without smell may then be perceived. Reverting to the experiment previously shown, you will perceive that the chemical effect of the alkali (lime) is to unite with the hydrochloric acid, and the ammonia flies off. This chloride of ammonia is more familiar to us as sal ammoniac. We have seen that ammonia is one of the forms in which nitrogen feeds plants; but there is another form—that of nitric acid—not the strongest acid we possess, but next to sulphuric acid in that respect, and better known as aquafortis. It is a powerful caustic, and yet composed exactly of the same elements as atmospheric air—nitrogen and oxygen. What is more extraordinary

still, instead of the largest percentage of nitrogen, it has the smallest, and the largest of oxygen; but the proportions in which they unite produce one of the strongest acids in nature. I bring this before you because it is almost the only other form in which nitrogen becomes the food of plants. Nitrate of soda employed as a top dressing, is composed of nitric acid and an alkali, the base being soda; and its great effect on vegetation is due to the nitric acid and not to the soda. The experiment has been tried again and again, and if soda were the element that yielded the benefit, we should not give £20 a ton, more or less, for nitrate of soda, whilst we could buy salt which contains as much soda for as many shillings. Mr. Pusey used nitric acid in a diluted form in one of his experiments, and the same effects were produced as if he had applied nitrate of soda. Ammonia and nitric acid both exist in the air. With regard to the nitric acid, a Frenchman greatly startled chemists by the announcement of the fact of a great amount of both ammonia and nitric acid existing in the atmosphere. But this only served to show that no single experiment ought to be relied upon, but ought to be tried by other chemists before being received as an established fact. Boussingault and Professor Way both found that they could obtain from rain-water nothing like the same quantity as the French chemist had succeeded in obtaining. The experiment of the one had been performed in the city of Paris, that of the two others with rain collected in the country; and the larger quantity of ammonia, which in cities arises from smoke, from the large consumption of fuel, from dunghills, and decaying bodies, than in the country, might create, in the atmosphere in the neighbourhood of towns, more than double the quantity in that of the country. This fact, in itself interesting, also accounts for the great amount of vegetation that succeeds frequent thunder showers in some root crops—not that lightning has any direct influence; but a thunder shower generally descends suddenly, and after a drought of some little extent, and consequently brings down with it whatever ammonia and nitric acid exist in the atmosphere. Way found that there was in a year's fall of rain per acre:—

Nitric Acid.	Ammonia.		Total Nitrogen.	
(1855)	(1855)	(1856)	(1855)	(1856)
lbs. 2.98 to 2.80	7.11	9.53	6.63	8.731

There being from 44 to 46 lbs. of nitrogen in an acre of wheat or barley, that quantity it will therefore be seen is considerably more than the rain can bring down, and the French chemist had possibly overrated the effect. It is thought by

some that dew and fog are richer in ammonia than rain, but although they are somewhat richer, yet upon careful experiments it has been found that the quantity of dew per acre deposited in the ground is not more than 10 tons, whereas, the quantity of rain is 2,500 tons per acre. Professor Way, in his excellent paper on soils, has noticed that strong soils or clay have a great power of fixing ammonia; so, if we dilute a strong solution of ammonia and throw it over a quantity of soil, very soon all smell of ammonia will disappear. This seems to be a very wise provision of nature that a substance which costs so much money, and is of so much value, should not, like other alkalis, become rapidly soluble and soon washed out, but should thus be retained in the soil for the uses of vegetation. Not so nitric acid, although it also is of so much value applied in a particular manner to particular uses; it is soluble, and, unlike ammonia, soon washes out of the soil; so much so, that I would impress this observation on your minds that you may not be led to throw it away, or to find what you had done rendered useless. You may apply ammonia as sulphate of ammonia, carbonate of ammonia, or ammonia in the form of guano, and it will be fixed by the soil without being washed away; but if you apply nitric acid in the fall of the year or in the winter, you run great risk of a considerable portion being washed out of the soil again. Thus it is that different results and effects occur. Some may say, "It agrees with my land excellently and answers my purpose, and I can produce six bushels more per acre when nitrate of soda is applied." Others may say, "I get nothing but straw—it has no good effect whatever." Now this greatly depends upon the mode of application. Nitrate of soda should be used only as a top dressing, and never applied to an exhausted soil, nor unless there be vegetation then and there to take up that which is so valuable, and thus you run no risk of losing money in so valuable an ingredient. It will not do at all times to estimate the value of manure by the quantity of nitrogen; for it was found by a late experiment of Mr. Lawes, that a greater effect was produced by nitrate of soda on barley, than by an equal quantity of nitrogen in the form of sulphate of ammonia. I have myself seen, continually, similar effects produced upon grass and wheat, more particularly on strong land. This also shows that nitrate of soda should be applied late in the season, and never upon poor and exhausted soil, because it would act as a stimulant, supplying one particular element of vegetation only, and stimulating plants to put out their roots and extract from

the soil all the other portions of nutriment necessary for their existence. When a manure produces this effect, it is undoubtedly a stimulant, and we should never apply nitrate of soda unless we are sure there is something to respond to the demands of the plant—that there is phosphate of lime and other elements present there to satisfy it. It is then the fact that nitrogen exists in various forms in manures. But if we apply lime or strong alkali, it is at once converted into the form of ammonia, and readily escapes. Guano owes its very powerful smell to the quantity of carbonate of ammonia always escaping. Where lime exists in land its ammonia will be developed. Now all land fit for vegetation, in a greater or smaller degree, possesses some lime—in this neighbourhood abundance of chalk, probably more than is wished: in others it is deficient, and it is necessary to add it before vegetation can take place successfully. Here is some of the ordinary manure for the wheat crop (*exhibits it*), which, being used as an autumnal application, it is necessary should not be too rapid in its action. As the manure passes round it will be found to have little or no smell, and then it will be shown to smell as soon as a little of the alkali—possessing in itself no smell—is added. (*This was accordingly shown.*) Now, it has been pretty well proved, notwithstanding a vast amount of argument to the contrary, that the essential manure for the turnip crop is phosphate of lime, and that the equally essential manure for grain crops is ammonia, or nitrogen, in some form. You are aware that a great and not very good tempered controversy has arisen betwixt Baron Liebig, and Mr. Lawes and Mr. Gilbert, on this subject. But it was previously known to the agriculturists of this country that the proper manure for the wheat crop was ammonia, and that for the turnip crop phosphate of lime. It is not a new fact. We were well aware of it 10, 12, or 15 years ago, and this it would be easy to prove. But Mr. Lawes has instituted some very laborious experiments, which have set the matter still clearer; for he has well shown that whilst he continued to apply phosphate of lime to the root crops, he succeeded in raising a greater amount of roots year after year; whilst, on land which had no manure, they dwindled, in four years, from 4 tons to 3 tons, then 13 cwt., and nothing in the fourth. He found, likewise, that he by no means produced the same effect by adding salts of ammonia to a considerable extent. He applied to a crop of turnips, in considerable doses, sulphate of ammonia, but, without the phosphates, and had no crop. Professor Voelcker, in the last part of the Society's Journal,

has given the results of experiments which set this in a yet stronger light. If we adopt these experiments as our guide, we should feel almost disposed to say that nitrogen and ammonia are totally useless to the root crops. But there is a drawback to them which I shall mention. It is that in spite of all his endeavours, Dr. Voelcker obtained only a half crop at the best, viz., from 15 tons farmyard manure, 7.16 tons; from nothing, $2\frac{1}{2}$ tons, or rather under 3; from 6 cwt. bone ash dissolved in sulphuric acid, from 8 to 9 tons; from sulphate of ammonia nothing (but as applied there is no doubt its pungency injured the seed), and not more when sulphate of ammonia was added to bone ash than when it was not. We must be cautious, however, in building our superstructure on too narrow a basis; we must repeat these experiments. The following experiment, if I may venture to quote myself, is one which I made and published in a little paper ten years ago:—"I was anxious to ascertain what the effect would be of applying to the turnip crop an excess of ammonia. With this view, in the autumn of 1848, I applied to a given space of ground, being a wheat stubble, a liquid preparation of ammonia: I was fearful, if I applied it later, the strength of the application would destroy vegetation; indeed, it had this effect to a considerable extent on the weeds in the stubble, and also on the worms and other insects, which were found dead on the surface of the land, showing that a powerful alkali, such as ammonia, acts as a poison on wireworms and other pests of vegetation—a fact in itself important, and consolatory to those who cannot divest themselves of the idea, when casting a few hundredweights of Peruvian guano on the surface of the land, that, while the cost of the application is certain, the benefit to be derived is altogether doubtful and hazardous. But to return to our more immediate subject: the stubble thus treated was ploughed and cleaned in the spring, in common with the adjoining land, and, early in June, drilled with Skirving's swede seed, the whole being manured with superphosphate of lime—that is, both that which received the ammoniacal application, and that which did not. The seed vegetated well, and it soon became a good plant throughout the field; but after a very few weeks, the land which had received the ammoniacal application could be distinguished at some distance by the dark colour and remarkable luxuriance of the greens. This continued throughout the autumn, and, on examining them a week before Christmas, it was found that the luxuriant greens had been the precursors of huge and monstrous necks, twelve to eighteen

inches long, and several inches in circumference. On cutting through these necks it was perceived that they contained nutritious matter similar to the bulb. It might be thought that these huge necks were forced on at the expense of the bulbs, but this was found not to be the case; for, on testing some average rods with the other parts of the field, it was found that while the latter proved to be at the rate of twenty-two tons per acre, the ammoniacal bulbs yielded at the rate of twenty-seven tons. In neither case did the individual roots reach a great size, in consequence of having been left too thick (no less than 160 to the rod), which arose from the circumstance of the rows being drilled only 18 inches apart, whilst the roots were hoed out as if the rows had been two feet asunder. I have no doubt the crop would have been greater if the number of roots had been one-third less. I shall call attention to the fact that it was not till some weeks that the ammoniacally-treated swedes were noticeable from the others: all came up equally well, and vegetated for some time with equal luxuriance, showing that the peculiar manure for the young plant is phosphate of lime in a soluble state. We learn from the experiment we have narrated that the peculiar effect of a large supply of ammonia to the turnip crop is to force on a luxuriant growth of greens and stems, but that this is not done at the expense of the bulb, but rather as an addition to it. At the same time, we might also draw the inference that a moderate application of ammonia is sufficient for the turnip crop." Professor Voelcker, however, found that a large quantity of sulphate of ammonia had no such effect on the greens: it was applied so late as June, broadcast, I presume, and in close contact with the seed—the other being applied in autumn, in a liquid form, to the soil. I am not recommending my experiment for general adoption, but you are familiar with the effect, however, of 1 or 1½ cwt. Peruvian guano, the effect of which on the autumn greens is to render them more luxuriant. There is none at first—but a visible effect afterwards, rendering them longer in ripening, whereby the mildew is to a great extent kept off, showing the importance of a mixture of ammonia with the turnip manure; and I can't coincide with those gentlemen in opinion who apply phosphate or soluble phosphate alone, as ammonia, whether in the shape of bone dust, half-inch bones, or Peruvian guano, is a decided advantage. The drawback I have said in Dr. Voelcker's case is, having obtained only a half crop at the best. It may be answered that each experiment fared alike. But it is important to ob-

serve that the atmosphere can supply, by means of rain and dew, a certain quantity of ammonia and nitric acid; now the quantity imbibed by a good root crop, such as turnips, is much more than that taken up by a small crop. In 20 tons of bulbs there is considerable nutriment and nitrogen. This, if absent in the soil, must be largely supplied from the atmosphere, from rain, and from the ammonia floating over the largely developed leaves. If sufficient with that in the soil to produce a good crop, the atmosphere may be alone sufficient to produce a half crop; and if we have here only a half crop, it is not proved that it is unnecessary or undesirable to apply ammonia to root crops. It is a pity the learned doctor, on a small portion of ground, did not water the crops; if he had supplied artificially what the rain failed to supply, he might have obtained different results. But this has been no fault of his; he has repeated the experiments for two years, and means to repeat them again; and as soon as he gets a good crop, say 20 tons per acre, we may begin to form a theory upon his facts. I don't object to anything he has done—no man experiments more carefully; no man is less likely to be led astray himself or to lead astray others. [The lecturer then sat down to enable any of the questions usual on such occasions to be put to him.]

The CHAIRMAN, at the conclusion of Mr. Spooner's lecture having announced his intention of departing from the usual mode of calling upon particular members to continue the discussion expressed, at the same time, a hope that any gentleman having practical questions to ask would put them.

Mr. Crane, as well as the Chairman and Mr. Dunham, then put a variety of questions, the objects of which, for the sake of compression, we must leave to be gathered from Mr. Spooner's replies, and

Mr. SUMMERS spoke as follows:—Mr. Chairman and Gentlemen,—I have a few observations to make on an ammoniacal manure which I applied to cereals and vetches two years ago. The following is the analysis of the manure—this analysis I received from Professor Way:—

Moisture.....	7.91
Organic matter, &c.....	10.17
Sand, &c.....	1.68
Soluble phosphate.....	3.10
Insoluble phosphate.....	0.47
Sulphate of lime.....	5.82
Sulphate of soda.....	14.14
Common salt.....	33.83
Nitrate of soda.....	15.38
Sulphate of ammonia.....	7.30
Ammonia in organic matter.....	0.20

100.00

This manure was applied in March to a piece of wheat which was sown after old lea, and which I thought required some nitrogenous manure—the minerals being more abundant than available nitrogen. It was sown over the whole field with the exception of the two ridges which were left to see the effect of the application. Where the manure was spread, a much darker hue was soon perceptible, and the wheat got the start of that on the two ridges that were left unmanured. This dark green gradually died away, and the wheat was again the colour of that on the two unmanured ridges, but the leaf was wider and the plant was stronger. A few days before harvest it could be distinctly seen that the unmanured portion was at least three days later in ripening than that which had been manured, and I believe that there was quite one sack per acre more in the manured portion than on the two ridges which were left unmanured. I calculated that I got seven sacks per acre on the two ridges, and eight sacks per acre on that which was manured. The same manure was applied to barley which followed a crop of wheat—it was spread over a part of the field where the chalk was turned up by the plough through the little depth of soil. Here the effect was very striking, the produce being, I believe, doubled—both straw and grain. I also applied it to spring vetches on a thin chalk soil. These vetches were sown after wheat; it was only sown over a part of the field, so that, as in the other instances, I had the opportunity of judging of the effect. It caused no apparent difference in the growth of the vetches; but, what was very surprising, it gave great vigour to the charlock that was growing with the vetches—the plants were twice the height where this ammoniacal dressing was laid on. I do not approve of top-dressing as a rule, but where it was resorted to, and where it is required, I would recommend the following as a good mixture for cereals:—

Nitrate of soda	25	per cent.
Sulphate of ammonia	25	”
Common salt	30	”
Vitriolized guano	20	”
	<hr/>	
	100	

The nitric acid and ammonia in the nitrate of soda, sulphate of ammonia, and vitriolized guano, are of different solubility; therefore, where this mixture is applied, the plants will be supplied with food during their progressive stages of growth. In the vitriolized guano, we have also soluble phosphate, which is of especial value to the barley crop. The salt I add, as a corrective of any tendency of the other compounds to produce over luxuriance.

Mr. SPOONER, in replying to the observations which had been made, only wished they had been more numerous, assured that if the members would only draw a cheque upon their memory and experience, and give the club the benefit of the amount for which that cheque would be honoured, they would all of them derive advantage. The Chairman had commenced with the question why the nitrogen of the atmosphere was not made available by means of some chemical application? He could only tell him, that if he knew of such an application and could put them up to it they would be much obliged to him. Sulphuric acid, of which he (Mr. Spooner) manufactured largely, had, for one of its ingredients, the oxygen of the atmosphere; and as they could not obtain that from the atmosphere fast enough, they were obliged to have recourse to the use of nitrate of soda; and the oxygen which gave to sulphuric acid its pungency and potency was derived from the atmosphere by the aid of nitrate of soda. Of course he meant to say that it was converted from sulphuric to sulphuric acid by these means; and to sulphuric acid they (the farmers) were much indebted, for without it, or some acid equally strong, there could be no superphosphate of lime. Thus they could use up the oxygen of the air. But what would they think when he told them that whilst they did so, they were obliged to allow the nitrogen to escape up the chimney. If it only could be arrested, an important point might be gained, but chemists had united all their efforts to arrest it in vain. Sometimes, indeed, a shout had been raised like the false “hark hollow!” sometimes heard in fox-hunting; for the discovery after all had proved to be fallacious, and they were found to remain in possession of precisely the same amount of knowledge on the subject as before. The Chairman had next observed that nitrate of soda, being a stimulant, it was good for the outgoing tenant, but by no means desirable for the incoming tenant to employ. There was a certain amount of truth in this, but it would not do to take it. Good farming ought to be practised whether by the outgoing or by the incoming tenant. If, indeed, a tenant were used ill, then he had every inducement to make hay whilst the sun shone; but he (Mr. Spooner) could hardly recommend it. And at the same time it was hardly desirable for the incoming tenant to despise the use of that which he saw other parties using year after year with advantage. It would therefore be prudent to use a certain amount of nitrate of soda and other salts. With regard to the top-dressing which Mr. Summers had recommended, it had its advantage, and they

brought up wheat and barley crops by its means. A barley grower, whose produce was as good as any in the market, used some every year with profit. They must, in fact, resort to this or other means where their land was required to furnish liberal crops; for if they only put on dung every four years something else was required to realize its advantages. If they improved their dung by feeding with corn or cake, or supplied the deficiency by means of artificial manures, what were they doing in the one case and in the other? Just supplying more nitrogen or more phosphate. Double the nitrogen and the phosphates, and they would double the value of their dung immediately. One ton of dung so enriched in the yard would, in fact, become more valuable than two tons; and this was the reason why the agriculture of England was now so superior that they could now produce 8 or 10 sacks per acre as easily as their grandfathers had produced 6 sacks—not that they applied more dung, but because it was of a better quality, with more ammonia, more nitrogen, more phosphate, and, consequently, capable of producing better crops. The question had also been started why lime sometimes weakened the soil, and why lands that had been overlimed were never so good again? Why? Lime was a powerful cause of the riches of the soil being used up. Ammonia applied to the land became fixed by the soil; but by lime and by water it became again soluble. This only showed that lime could not be dispensed with in modern agriculture, since it was so very active an agent in doing good and causing the riches of the soil to be freely used up. Thus it had been stated by one member of the club that his turnips, which had clubbed in sandy soils, when chalked grew properly. Now chalk was only lime rendered less potent. Where lime did not exist club root would prevail. This was owing to the field itself and not to the turnips. But it had been stated that swedes had been good in a field so chalked, which could no longer grow good mangold. The injury in this instance was mechanical. The benefits of lime, however, were chemical. Lime was wanted to reduce certain acids which produced this disease called club-root; and if lime had been added instead of chalk, or if considerably less chalk had been added, the remedy would have held good without the evil. After some further observations on the advantages of the use of lime, Mr. Spooner concluded by saying that the subject was very copious, and it was impossible to do it entire justice, but enough had been said to show that nitrogen, in some form, was a manure peculiarly required by the grain crops. The effects of

nitrogen were not mathematical; it was necessary to apply a considerably greater quantity of nitrogen to the wheat crop, for instance, than to the bean; yet the analysis of the bean crop afforded twice as much nitrogen as did the wheat crop. This was a theory not dependent on the chemical composition of the manure, but on the physiology and properties of plants. The wheat was a most grateful plant; yet, as regarded ammonia, it would appear to waste more than was applied. If they were to apply 30lbs., for example, as an experiment, expecting to get it back, they would be deceived, as they would not get back half the nitrogen contained in the manure. This showed the advantage of rotations in which one shift bequeathed to another a vast amount of nitrogen, the material of future crops, and aided in deriving it from the soil and the atmosphere by another direct application of agents. There was no better system than a wise and discreet rotation of crops; and, without making extravagant experiments, they must farm liberally if they would farm well and farm successfully.

On the motion of the CHAIRMAN, which was duly seconded, the club assented to the expression of thanks to Mr. Spooner, to whom there could be but one opinion of their being greatly indebted. He had supplied them with that kind of information which they most wanted as farmers. They wanted to know what kind of manure to purchase, and what kinds were wanted for particular soils. For, as different soils required different descriptions of manure, it was only the chemist, who deeply studied the matter, who was enabled to tell them how to lay out their money to advantage. That was not the first time that Mr. Spooner had travelled from home by the mail train to contribute to their information. His labours were of a practical nature, which they could all understand and appreciate. And they would all accord cordially in awarding him a vote of thanks. He (the chairman) could only say that, so far as he was concerned personally, of such a practical nature were Mr. Spooner's remarks, that he had learnt more that evening concerning manures and their application than he had ever learnt before.

After a few words of acknowledgment from Mr. SPOONER, the meeting separated; Mr. Spooner just observing that the question had arisen whether dung should be applied to the surface and distributed, or ploughed in at once, or matured in the dungheap beforehand. He believed, himself, it was far better applied to the surface, which would permit as little as possible to fly off,

as the rain water thus washed in its soluble part, | greater part of the ammonia would be acting at
and when the plough turned over the ground, in- | only one or two inches deep from having been
stead of its being all four or five inches under, the | previously washed in.

LONDON, OR CENTRAL FARMERS' CLUB.

EDUCATION AND DISCIPLINE OF THE YOUNG FARMER.

The Monthly Meeting of the Club took place on Monday evening, March 7, at the Club-house, Blackfriars.

Mr. Trethewy, in the absence of Mr. John Thomas, the President of the year, was called to the chair. There was a large attendance of members, including Messrs. R. Baker, James Wood (Sussex), T. Owen, W. Fisher Hobbs, (Rev.) C. T. James, J. A. Williams, J. Russell, J. Nockolds, E. Little, J. S. King, C. J. Brickwell, S. Skelton, J. Wood (Croydon), W. Walton, L. A. Coussmaker, T. Lyall, J. H. Sawell, T. Congreve, W. Mitchell, G. Dobito, G. P. Tuxford, E. B. Waite, W. Heard, S. Sidney, R. Marsh, J. Hooker, G. S. Harrison, W. Eve, J. Odams, G. Wilsher, J. C. Nesbit, E. Tattersall, T. Chandler, J. W. Smith, G. Fidler, H. Shotter, D. Reid, W. Kemp, &c.

The subject for discussion—introduced by Mr. R. Bond, of Kentwell, Long Melford, Suffolk—was, “The education, discipline, and introduction of the young farmer to life.”

The CHAIRMAN, in opening the proceedings, said he felt bound to afford some explanation, by way of apology, for appearing in that position. He did so in consequence of the unavoidable absence of Mr. Thomas. It happened to be that gentleman's rent-day. He was one of the largest tenants on the estate of Lord St. John, as well as one of the largest farmers in Bedfordshire; and as his lordship made a point of dining with his tenants on the rent-day, Mr. Thomas thought it would not be becoming in him to absent himself. He (Mr. Trethewy) trusted that, under these circumstances, his own services would be accepted (Hear, hear).

Mr. BOND said: Mr. Chairman and Gentlemen, we have this evening to consider and discuss an unusually important subject; and it will be well for us to bear in mind, that we have not simply to determine a mere material question, embracing the cost of agricultural production, or the increase of our pecuniary gains; but we have this evening to dwell upon the culture of mind, not matter—of man, not material. We have this evening to dwell upon the cultivation of the cultivator of the soil himself; and much may fall from our lips which may tend not only to form a character and fix a future; but I admit it will be a matter of regret with me if we do not succeed in propounding and moulding the formation of a system which shall be calculated to meet the increased educational requirements of the age—a system which shall ultimately be instituted to exalt the intellectual standard of the agricultural character,

and which shall be destined to increase the mental, moral, and physical greatness of Old England. You will plainly perceive, gentlemen, upon the question of agricultural education, I am an advocate for action and co-operation; and I am extremely desirous to see the Central London Farmers' Club occupying the proud position of a pioneer, practically, in every agricultural movement of desirable progress and undoubted usefulness; and I trust, in this instance, we shall this evening not only consider wisely, and discuss fully and freely, but that we shall resolve, prudently and firmly, to carry out to a successful issue some desirable agricultural educational movement. In this age of change, progress, and improvement, no change has been more marked and decided than the altered position of our British agriculture within the past fifty years. Not half a century since, and the agricultural art was comparatively pure empiricism; it was practice without science, practice without the light of reason; and the standard of agricultural intellectual attainment was necessarily low and meagre. Agriculture, as a purely imitative art, required no depth of knowledge even in its best qualified professors. There was nothing in a simple course of routine to tax the mental powers. But within the present century how marked the change! We have now the widest field and the most extended scope for intellectual exertion; we have now the whole of Nature's laws opened up for our investigation and research. There is scarce a science but bears directly or indirectly upon the art by which we live; and for a rational fulfilment and a thorough comprehension of agricultural practice, I know of no business or profession at the present day requiring a deeper knowledge or a higher degree of intellectual attainment. Agriculture is no longer a mere blind question of ploughing and sowing; but agriculturists now require to understand the object, reason, and result of every mechanical operation. They require to know why ploughing benefits the land; why draining answers; what the plant derives from the soil, what from the air; why one manure as applied to the soil answers, why another fails to answer; how light and heat affect the plant; how they influence the crop; why the animal thrives well upon one kind of food and not upon another—to say nothing of the structure of the plant, the anatomy of the animal, the construction of machinery, and many other subjects requiring the greatest mental application to qualify any man to comprehend the intricacies of Nature's laws and the complications of Nature's operations, which it is the farmer's greatest success to subscribe to, to foster, and promote.

With such a flood of light and of scientific knowledge as the past fifty years have produced, has the agricultural educational system or the educational standard of instruction kept pace? We have this evening to express our opinion, and we have to pronounce our verdict upon the fitness or unfitness of our present system of education to the altered and elevated position of British agriculture. It is necessary upon this subject we should speak out; and allow me to propound the question—Are the youths and young men of the rising generation so educated upon the best principles of instruction that they are thereby best fitted to cope with their future position? Are they so educated in the knowledge essential to their calling, that they will prove equal to the requirements of their business? Are they so educated, that they are thereby fitted in intellectual attainments to the altered and scientific standards of their profession? Will they prove thorough men of business, thorough in knowledge, thorough in judgment, and successful in practice—really thinking men? Or will the result disclose the fact that there is rottenness at the core of our existing system of education and discipline? I know, well, such questions as the foregoing may be met with the conservative plea that we have done well enough in the past. In such an opinion I fully agree. Without much education the farmers of England have cultured England to a degree of perfection unknown beyond her shores; without severe educational training, we have succeeded in beating the world in agricultural productions; without a deep knowledge of science, we have practically solved the most scientific problems; and, till recently, science has rather followed in our rear than advanced as our vanguard. But because we have succeeded practically, and that most successfully, shall we reject a proffered aid? Shall we reject the helping hand of a helping handmaid? Shall we, who have practically preceded science, close our minds to the enlightening truths of science? Shall we, who deal in the culture of Nature's products, close our eyes to the revelations and explanations of Nature's laws? Shall we blindly continue in empiricism, when reason waits to reveal the *rationale* of every operation? Can we afford to reject such knowledge for the rising generation of England? for those who will quickly occupy our positions, who will have to uphold the honour of England's agriculture in a world-wide race—against some odds—in a world-wide competition? Will they not need the stimulant and assistance of every adventitious aid? I am well aware it may be said that the best-educated are not always the best farmers or the best men of business. This is perfectly true. I know of men whose school-history is a farce, and their educational chance was at best but a poor one. I know of such agriculturists; yet those very men are possessed of such sound common sense, of such caution and prudence in the affairs of life, of such clear observation and shrewd reflection, of such prompt and defined judgment, that in any age they must be noted as men of no common mould: but let it be remembered, that facts and information are the basis of their correct reasoning, of all correct reasoning, of all soundness of judgment; and a greater knowledge,

in their case, of Nature's truths, would but have made them more powerful men in Nature's laws, and in the practical operations of every-day agriculture. Such men, with a storing of scientific facts, would but have been more prominently the pioneers of progress; and though I condemn the nonsense that a man cannot farm without a knowledge of the sciences, yet I broadly propound the fact that the truths of science, especially in our own heads and hands, are admirably calculated to introduce us to more paying processes, and to insure to us increased pecuniary returns. I am not ignorant of the marked improvement which has characterized the agriculturist of the present age: I believe no section of society has more advanced in intelligence, knowledge, and position. Capitalists and capital have reduced the small holdings, banished the old feudal system of favouritism in business, and supplanted a degrading subserviency by an exalting respect. Men are now rare who are agricultural bores or inveterate grumblers; and though there is still the disposition in society to assume the fact that the agriculturist, however unlimited his capital or his ability, has no right to a position in society, or to the modern refinements and amusements of life, yet England can boast of sons of the soil, high in intelligence, exalted in principle, and thorough in business—men of whom even England may justly be proud; yet, notwithstanding this vast social and intellectual improvement, when I view the relative positions of the sciences bearing on agriculture, and the scientific culture of the agriculturist, I can plainly perceive a vast distance of space. Scientific truth is far a-head. Individually I feel it. Thanks to the revelations of our Liebig, Lawes, Gilbert, Playfair, Way, Nesbit, Voelcker, Johnson, and others, that science is not in advance of our practice; but science is infinitely in advance of ourselves—she has much to suggest to us, much to tell us, much of which we cannot afford to be ignorant, and all of which the rising generation ought to know, ought to aspire to, must acquire; that, as agriculturists, they may base their reasoning on correct data, and improve by their reflection and research the agricultural practice of the kingdom. The British yeoman has been always noted for that sound common sense, which, though no science, is fairly worth the seven—a common-sense, which could neither be won by a fallacy, nor be deluded by a delusive theory. Profit has justly been his badge of discipleship; but it is necessary now to combine, in the same person, common-sense with agricultural science; it is necessary that the future and rising generations of farmers should possess the highest intellectual attainments, and I believe it requires a severe discipline of study to master the intricacies of scientific agriculture, and a rare combination of powers correctly to carry out the principles involved in the most successful practical issue. I advocate a thorough proficiency in the sciences, because I believe such knowledge is admirably calculated to increase the pleasure and profit of farming; I believe it is the precise knowledge necessary to prevent mistaken outlays and wrong applications; to insure the placing of the right manure in the right place, the

giving the right food to the right animal, and the doing the right thing in the right way; to lessen the cost of production and to increase the annual returns; to win more fully the prize we all have in view, viz., money, or money's worth—to secure by scientific culture a secular success. I will now enter upon the question of education, and I purpose to consider the necessary changes in the course of study to be pursued, and the system of education necessary, in the agricultural schools of England. What then is our object in education? It is to draw out the latent powers of youth; to culture for the future as well as for time; to discipline the heart as well as to inform the intellect; to make happy men, respected men, men beloved by their fellow-men, and to insure success in life. Let it be remembered that education is not a mere matter of schoolmasters and of school discipline; parents cannot, in reality, delegate their responsibilities. Rely upon it, education commences at a much earlier stage than we commonly recognise; and from whom the child learns his mother-tongue, from the same does he imbibe his principles. We speak of breeding and blood, as if hereditary likeness arose from the simple fact of parentage; depend upon it, the force of imitation, and the power of influence and example have more to do in the formation of a character than the power of descent. We who are accustomed to the maxims of breeding admit, as a fact, that much size goes in at the mouth—that the quantity and quality of the food govern the physical development of the animal; and, rely upon it, the mental inclination and the dispositional development of the child are governed more by those quick and early inlets to the soul—the eye and the ear—by the influence of those around them, than by any inert inborn principle. We are daily becoming more alive to this fact in the careful selection of servants, and in the choice of playmates and companions; and I enter into this digression to show that the boy may have received a wrong impression long before reaching the hands of the schoolmaster, and the tutor has probably to deal with a spoilt child, instead of a promising, well-cultured, well-trained boy; the twig has received a wrong twist, and to rectify the past, to antidote past poison, to regain wasted opportunities, and, at the last, to stand well in the race with so unpromising a colt, is more than we have a right to expect; and I here express my conviction that more than half the failures and sorrows of life are traceable to the want of the proper fulfilment of parental discipline, extending from childhood to the age of twenty-one years. I am a great advocate for the culture of the heart as well as the culture of the head; no man is truly a man without it; and it is especially the duty of parents early to implant, to foster, and to uphold sound Christian principle; to culture in acts of reverence, in feelings of love and affection, and in deeds of unselfish kindness; to insist on obedience and truthfulness. And it has been my observation that without this Christian security the most successful secular life is at best but a mistake, and the most hopeful intellectual attainments a comparative abortion. There must be the ballast of sound principle, of right feeling,

and right doing, as well as the sail or the steam-power of ability. Education cannot be purely secular to be successful; and though my observations on this point may appear beyond the mark, yet I plainly assert that no education is perfect, no prosperity sure, no happiness complete, which is not based on Christian principle. I have informed myself, by an extensive correspondence, upon the course of agricultural study generally pursued throughout the kingdom. In the Colleges, such as Cirencester, Kensington, and Queenwood, the whole course of study is enlightened, suitable, and satisfactory. In the local schools, generally, the sciences are much neglected; in more than one-half of the prospectuses received from such schools the sciences are not even mentioned, and in many, where alluded to, it is in a foot-note, to state—"taught if required." Now, it is not the fault of the schoolmaster that this is the case: it is for us, as agriculturists, to make up our minds, to have clear views upon this point, and to express our wishes. It is for us to say whether these things ought thus to be. I observe there is the same dunning at Latin and Greek as when I was a school-boy, and I dare say there is the same plausible reason given for the continuance of the system, viz., discipline. Now there is no one a greater advocate for mental discipline than myself, but why the dead languages are so infinitely superior in their influence I cannot for the life of me conceive. To me it appears such studies may make boys word-searching mental-memory machines; but what is there to excite the observation, to induce inquiry, to lead to reflection and real thought? Now, where the dead languages so essentially fail, the sciences so eminently succeed. The sciences dwell upon subjects of real utility—subjects which meet us at every turn; and such subjects of every-day life are ever suggesting consideration and research. They constantly interest the boy, and teach him to use both his perceptive and reflective faculties. The boy sees a plant, and contemplates its construction; he thinks over the process of vegetation, the works of the roots and rootlets, the ascension of the sap, the functions of the leaves, and the whole busy process of accelerated nature most actively working to manufacture food for man. He sees a steam-engine, and at once examines its manufacture; he understands its mechanism, and contemplates the possibility of some mechanical improvement. All nature and art, to a mind scientifically cultured, are vast fields of interest, of observation, and thought. Surely, then, gentlemen, for those destined for agriculture, a study of the sciences is the course to pursue, to manufacture thinking boys and intelligent thinking men. Give the boy an early bent to understand the why-and-because of all around him; you thus place before him a deep mine of wealth, which it is discipline indeed to comprehend, and a study throughout life fully to acquire; he never lacks a subject for intelligent thought, and you culture the mind, by a gradual process, to make constant efforts; the knowledge and facts acquired, all bearing upon agriculture, are literally power—power to apply in the manufacture of meat, and the manufacture of corn; and you culti-

vate, at the same time, that indispensable guide in all the business transactions of life, viz., a thoroughly well-balanced judgment." Now, gentlemen, what do the dead languages effect? They simply train to a word-research, to the cultivation of the memory, and they teach the derivation of words. Too often the dead languages, indirectly, have even an injurious influence: they erect a wrong standard in the minds of youth; boys view a high attainment in the classics as far transcending a common scientific knowledge of common things; they despise the useful; and that acquisition of the languages, which you intend as discipline and as a means to an end, they cling to and believe to be the end itself. When I turn to my own experience I can plainly perceive that two years' study of the sciences have proved of more benefit to me than many a year's grinding at Latin: in my education every one pound's worth of science has yielded a larger return than each ten pounds expended in the classics. In the sciences I was interested, I could understand their usefulness, and, upon leaving school, it afforded me pleasure to prosecute my studies, and each day in the agricultural world I find something to observe and learn and turn to practical usefulness. Upon the scholastic studies generally, I would observe, it is highly desirable every boy should be able to read clearly and fluently, without hesitation and stammering; it is equally desirable he should be taught to write a good, plain, legible hand, apart from all curvilinear flourishes, rectangular excrescences, and the complete ambiguity which characterises the writing of the present day. Let each boy, too, be especially well-grounded in arithmetic; by some means implant a taste for figures; for the system of good and correct accounts, in every matter of business, is one of the grand secrets of success in life. Of course there are grammar, spelling, and history to be learned; but I am convinced upon these subjects there is much time wasted. I forget how many works on grammatical rectitude I succeeded in wearing up. I know several; and that, too, in learning by rote rules which I never knew how to apply, and in attempting to rectify sentences which were designedly made wrong. In spelling, the same: it was my duty to correct misspelt words; but I candidly believe it would have been infinitely more to my advantage that I should never have seen the grammatical and orthographical mistakes, as the eye and the ear became habituated to and familiar with error. I am convinced I not only wasted time, but that I received a positive harm from the process. Again, let a knowledge of sacred and profane history be acquired; but I must confess I could not, nor can I even now, see the utility of learning by rote the dates of the ascension and death of every monarch who has occupied the English throne. A knowledge of geography is, of course, desirable; also a knowledge of mathematics. I believe the plans of theme-writing and of close verbal questioning, upon every study, are most desirable, as ensuring a thorough grounding, which is the basis of accuracy, self-reliance, and after self-development. To me it appears, too, most desirable that the parent, if competent, should regularly and carefully examine his

son, and thereby note his progress; but for general, everyday, local schools to be useful, we require reform. We require a public board of agricultural examiners, who shall duly examine each candidate, in the first instance, at sixteen years of age, in all that constitutes a sound agricultural education; we should thereby introduce competition and a standard of merit, and the most meritorious, painstaking, competent master would have the largest proportionate number of successful boys. I advocate such reform, to rid us of incompetent masters—to secure patronage to the deserving; and the mere fact of such an examination would excite a spirit of emulation amongst the boys themselves; and often, in their hours of wished-for idleness, would they remember they must render an account some day; and that the fruits of indolence would be exposure and disgrace. Such a public system of examination would ensure the general adoption of the most desirable course of study, and force up schools to the necessary standard of proficiency. At the same time, such a system would embrace agricultural schools of every standing—the small as well as the large—and have a general influence for good. In ten years, so radical would be the change, that Dickens—who, in "Nicholas Nickleby" justly caricatured the old system of education—would see an almost undreamed-of reformation. Further: upon a youth leaving school, the necessity is obvious for continued intellectual discipline; and how requisite it is for a young man to have continually some intellectual object of attainment before him! I note the present system: a boy leaves school at sixteen years of age; he throws up his hat, and concludes his education finished, when, in reality, it is but just commencing. More than half the young men destined for agriculture in England actually waste, and worse than waste, the first four or five years of their freedom from scholastic restraint. There is a thorough desultory life; they throw up all intellectual culture, and they have no intellectual standard of attainment to which to strive to attain. They probably assist in the farm-management; but as they have no responsibility, the farm occupies but little of their thoughts; as they feel but little interest, they observe but little; and the rat-hunt, the cricket-match, the run with the harriers or fox-hounds, the quadrille-party, the shooting exploit, with other amusements, combined with a profusion of tobacco, are their real employments—their true business of thought and occupation. How are the evenings spent? Often in a desultory, do-nothing industry, or in card-playing and smoking—in colouring a clay or an idolized meerschaum—or, if in literature, in perusing some trashy love-tale novel, in studying "Blaine's Encyclopædia of Rural Sports," or in reading the last number of the "London Journal." I speak, gentlemen, from facts, from my own observation; and only in ridicule, I fear, can it be said that such training will create promising candidates for future agricultural honours! This is not a desirable course of discipline: reared in a desultory manner to sport and to spend, to study their own pleasure and indulgence rather than their interest and advantage, it will be no matter of wonder or surprise if pleasure is their chief engrossment in after-life, and if

business, at the commencement of their career of responsibility, finds them deficient in knowledge and judgment. Such, gentlemen, is literally the case. I have seen young men make grand mistakes upon their first start in life, from absolute incompetency—especially upon clay-farms; and I agree with the observation of an old friend of mine, that it would well answer the purpose of many a young man, upon commencing business, to pay an elder to superintend and direct him in his management and supervision for the first two or three years. I am in no way averse to a reasonable amount of sport and amusement; I have had my share, and that a large one, of hunting, coursing, shooting, and the like, and I believe, too, without detriment; but let it be the condition that whilst sport is sport in reality and in earnest—whilst a young man rides across country with courage and judgment, and sports as a sportsman—that business and study are equally pursued with the same spirit of indomitable energy and perseverance. We hear a great deal too much, now-a-days, of the old tale that “All work and no play makes Jack a dull boy.” The truth is, that more work and less play would make Jack a bright boy, a business youth, and a thriving, successful man. I am for pleasure in reason, but for business in earnest; and in every case I desire to put aside the dreary, indolent, listless nonentity spirit which characterises young men, both in their intellectual improvement and in their business attainment and attention. I want to see young men fresh from school, not only breathing, but really living—living for an object—living for an end, and actually using the means to attain that end. I want diligence, and not a passive indifference, to govern their conduct. I want them to feel that time is a talent not to be wasted and squandered, but a talent to be used and improved; that they have much to do, and but little time to do it in. I want to see minutes more valued than hours now are. Life is a race, and, all else equal, the best training will make the best man, and secure the best place; and I know well that the idle brain is, most surely, the devil's best workshop. What, then, is to be done? Is it not desirable to adopt some course? Is it not necessary to act? Is it not essential to induce young men to cultivate habits of self-culture and of self-development? It is most necessary—most desirable; and it is a positive duty, on our part, to act to ensure it. What man was ever a man worth calling a man without such self-culture? Rely upon it, such is the upward educational movement that we positively cannot stand still. I even see it imperative upon us that we combine to co-operate; and as every agricultural society in England looks to the Royal Agricultural Society as its agricultural father, it is for us to take steps to induce our parent to act for the better education of her agricultural children. I believe farmers' clubs generally, and every agricultural society throughout the kingdom, would gladly combine to facilitate such a movement; and I know of no course so effectual as the establishment of a public board of Agricultural Examiners. I strongly recommend two examinations: one for junior candidates not exceeding sixteen years of age (as before alluded to), and one for senior candidates not exceeding

twenty-one years of age. I would certainly throw the examinations open to all candidates, as the only object would be to excite competition; and to grant an agricultural diploma to those competitors having attained to the necessary standard of intellectual acquirement. It could be a matter of no moment whether the knowledge of the senior candidates was attained by study in the privacy of their own homes, or by attending a course of agricultural lectures. It would be for the board of examiners to recommend the best works extant upon the various subjects and sciences for examination in the senior class; and it is highly necessary so to act as to ensure general competition. The standard of merit may not be set too high. Even the young man missing his mark and losing his diploma would in reality be a gainer—and a very great gainer, notwithstanding—from the habits of study and of mental discipline to which he had cultured himself in his attempts to secure the distinction of the diploma. I am well aware that such a board of examiners would have been of essential service to me; for though I continued to study chemistry, geology, and some other sciences, after leaving school, without the slightest incitation from those around me, yet I feel that the fact of a public examination would have been a sufficient inducement for me to have worked with redoubled diligence, preventing a foolish waste of time, training me in habits of mental and physical industry, and resulting in redoubled success. I do not think the middle-class Oxford University examinations meet our requirements; the whole matter will be far better in our own hands; the whole scheme may be self-supporting. We must carefully avoid the error into which the Highland and Agricultural Society of Scotland has fallen. That society required candidates to attend, for a period of two years, classes in five or six of the different sciences prior to examination. Such a requirement, of course, nullified the general usefulness of the scheme. The mistake is now rectified. In England or Scotland it must take a time for the competition to be great, or for the attendance to be large at the examinations, from the simple fact that the education of young men has been grossly neglected, especially after leaving school; and it must take a time to rear any number of young men, intellectually cultured and qualified to come forward for examination, or to compete for the honours of the certificate or diploma. With the existence of such a board of examiners, how far more powerfully could a parent stimulate his son to do his utmost, and to how much better account could the present system of agricultural pupilage be turned! In my own case, it would afford me pleasure to use my most strenuous exertions so to assist those gentlemen, at any future time resident with me, in their studies and preparation for examination, that they should pass with credit and *éclat*. How far more gratifying, too, to parents and friends, to see each hour both usefully and profitably employed, instead of having to contend with the natural fireside habits of indolence, with habits of late rising, with general frivolity, and a thorough indifference to mental culture and business proficiency! Seeing the

vast improvement, the complete revolution, which the Royal Agricultural Society has effected in agricultural mechanics, in agricultural machinery, in the breeding and development of stock, and in agriculture generally, I think I am not too sanguine in expecting the same improvement and the same beneficial result when that society turns its powerful influence to the mental development and the scientific culture of the agriculturist himself. There is an ample and wide field for action; and it is my conviction that in carrying out the system of agricultural educational examinations, lies hid in embryo the Royal Agricultural Society's most successful operations and her proudest triumphs. Having completed the educational portion of my subject, I will now turn to consider the discipline, and afterwards the introduction of the young man to life. I am anxious at once to establish the masculine fact that every man is the architect of his own fortune, and the carver of his own future. There is no such thing as undeserved success or unmerited failure. A man will sink or swim according to his ability in the battle or struggle of life. Whilst one man succumbs to circumstance, and becomes the creature of circumstance, another yokes circumstance to his car, and triumphs over his position, winning increased distinction from the magnitude of the difficulties surmounted. I am extremely desirous to be clear on this point. I want to put aside all the maudlin enervating doctrines of chance and misfortune. I want to establish a habit of real self-reliance. I want young men to see that they had far better trust to their own internal strength and competency, than to any extraneous aid. How many a young man has been ruined by his reliance on fortune! How many a young man has been spoiled and rendered unfit for success in life by his expectancies! Fortune at best is proclaimed a fickle goddess; and though bachelor uncles and maiden aunts are all very well, they are certainly crochety beings, difficult to please and easy to offend; and I had rather rely, ten thousand times over, upon the strength of my own right arm and upon my own internal power, than to trust to the whims, caprices, and uncertainties of succeeding to dead men's shoes. Wind-falls are always very acceptable, but they are broken reeds to trust to. Self-reliance is the qualification for success; and I am convinced, if we are men of observation, of thought, of industry, of perseverance, of principle and prudence, we must succeed in life, we must triumph, we must conquer. It is a moral certainty. No circumstance and no material power can prevent it. What is failure but industry unapplied or misapplied? or the fruits of labour undervalued and unhusbanded? In any case, trace the cause of unsuccessful. What is it but a lack of the elements necessary for success? what but a lack of prudence, of principle, of energy, of industry, or ability? I do not deny the existence of heavy overwhelming losses; but even these are usually traceable to the facts of hazardous speculations or imprudent outlays, and to the adoption of the man-or-the-mouse principle of sink or swim. In the common course of matters, I am tired to the heart at the sound of misfortune: it is a lulling misnomer for human

neglect and human incapacity. Many a man may say, "How could I avert my misfortune?" I reply such misfortunes are usually traceable to habits of early neglect in education or in training, and to the effect of neglected opportunities. How is it the members of a large family usually succeed in life far better than an only son? What is it but the effect of discipline, habit, and culture? The many are early taught to cut their own way, trained in diligence, to habits of care, economy, and hardihood, and reared upon the necessaries, and not upon the luxuries and supernumeraries of life—trained to produce, and not to squander; to save, and not to spend; whilst the only child learns the consuming to perfection, but not the producing; to spend, but not to spare or to save. What is it but the one cultured to succeed, and the other cultured to failure in life? But what is this enigma—success in life—of which we hear so much? What is it, but the power to produce exceeding the desire to consume?—what, but the balance after deducting the actual consumption from the actual production? Unfortunately in our day so strong is the love of appearance, so great the appreciation of comfort, that men forget the great secret of life is not so much in getting as in retaining—not so much in producing as in not spending. Unfortunately, spending is the order of the day; there is a false show abroad; but all men of sound sense will be content to walk if they cannot afford to ride, and to walk before they attempt to run. How many young men appear to suppose that life is governed by "luck," and that success is a mere toss-up matter of chance! Success is as much governed by fixed laws as the solar system, with this saving clause of exemption—that no rule is without an exception. You see, gentlemen, I lay especial stress upon habits, and specially upon the habits of self-reliance. I look to education to teach a man to use his brains, his eyes, and his ears, to show he has a head upon his shoulders, and to prove he does not pass through life half asleep; but I look to habits and discipline to effect much also. We are a bundle of habits; and if any young man thinks he will succeed in the daily life of agriculture by informing his mind alone, he will find himself mistaken. For success there must be habits of industry and not of sloth, of prudence and not of prodigality. But to enter more minutely, most strongly do I recommend every young man to adopt the habit of early rising; to carry out the habit of thinking nothing of trouble in business; to adopt active habits, and an active and prompt execution of every duty. Most thoroughly do I recommend the habit of correct accounts, and of noting down passing business events. I strongly urge that interest and advantage be studied, and not inclination and pleasure—habits of self-denial, and not habits of self-indulgence. Settle it down as a fact that you can do anything if you try, and cultivate the habit of perseverance. Men succeed by sticking. Cultivate the habits of cheerfulness. Bears with sore heads don't make friends. Cultivate the habit of a frank, open-hearted, manly manner, combined with politeness; for conceited borishness and pedantry don't assist to success. I strongly recommend

young men also to the habit of manual labour, sufficient to understand what labour really is, and to acquire a practical knowledge of the different operations of the farm. I think it well that young men should bear the yoke in their youth, and I give it as my experience that such a practical acquaintance with labour proves of infinite service throughout life. It is a splendid thing to be trained to labour, both mentally and bodily; also to spend with caution, and to act with care. Much more could I say upon habit—upon the habit of thought, the habit of observation, and the like—but I trust we shall hear no more the common cry of “what can I do?” or “I have no chance.” Every young man with health and strength may succeed in life if he will; but his success must be the fruit of education, training, and discipline; and if he neglects these necessary means to an end, he will probably go by the wall. I don't call being born with a silver spoon in one's mouth success; and I don't call living on the leavings of a parent or a friend success. But I call that success which is earned by industry, ability, tact, and perseverance; and I had rather have the chances of many a man without a sixpence in the world, possessing these qualifications, than I would the chances of another reared to nonentity and in habits of extravagance, though possessing thousands of pounds. Young men of England, look to it that your education is right, your training right, your own self-culture right; and with such a commencement success in the battle of life is more than half ensured or secured. Above all, rely upon yourselves, cultivate the quiet assurance you can overcome every obstacle, that you are equal to every emergency; but see that the result equals your convictions, or conceit will prove your shame instead of competency your praise. We speak of patronage; but who can patronize a fool? We speak of friends; but who, in a business point of view, can befriend the incompetent? The world will look to worth and ability; and in every case it is upon men so qualified the world bestows its premiums. Who has a situation to offer, and does not look about him for the best man? Who has a farm to let, and does not search for the best tenant? The world, from self-interested motives, will befriend the competent, while it throws men of incapacity to the dogs. And who does not know that there are more good situations in life than men qualified to fill them, and more good opportunities than men qualified to embrace them? I make the allusion with extreme diffidence; but in my own case, gentlemen, I have known what it is to start in life without two ten-pound notes in my pocket to keep each other company. I have known what it is to fight my way in the world; and though I have had many a kind friend to whom to be grateful, I have had a taste of the disadvantages and the difficulties of life. They are excellent discipline; and to show young men there is something in self-reliance, I tell them plainly I would start again to-morrow without a sixpence in my purse, without a murmur and without regret. Further, to show the power of self-reliance, I know young men who were so reduced in circumstances by the depression consequent upon the repeal of the corn-laws, that they

seriously contemplated an assignment of their affairs into their creditors' hands; yet these very men, by dint of courage, tact, and perseverance, though possessing at that time scarce a pound they could call their own, yet these very men have so pushed out hither and thither, have so doubled their resources, and redoubled their exertions, that they have now thousands of pounds instead of a few pence, with which to bless themselves. What others have done others may do; but young men must remember “life is earnest, life is real;” and they must learn to trust to their own strength, to labour, and to wait. I have spoken upon the education of boys at school, of the education of young men, and the discipline of habit after leaving school, and I now come to the last portion of my subject, viz., the introduction of the young farmer to life—his commencement in business. I am no advocate for young men sticking at home and being tied to their mother's apron-strings; but, as soon as qualified by stability of character and soundness of judgment—and the sooner qualified the better—let them commence business on their own account. By all means have them do something in some way to advance their own individual interests. If young men commence with capital, let it be with a moderate amount, barely equal to their actual requirements, for a superfluity of the needful never teaches the real value of money—and to teach the worth of the one pound sterling is highly essential in the opening of life. A few judicious monetary difficulties, in cutting one's way and in making ends meet, will do a young man no harm; difficulties are excellent tutors of calculation and careful outlay; whilst the necessity for industry compels to exertion, and prevents many a foolish extravagance. If parents are so situated that they cannot afford to give their sons capital, it is doubly essential a father should early insist upon a son turning out in the world, and working his own way. If there is no capital in the purse, there ought at least to be capital in the head, and young men of character, even in this competitive age, may succeed by trying. But young men must try: they cannot succeed by inaction. There is nothing like working one's own resources, and having individual responsibility for progress. In the matter of a farm there is a great deal in a good start. If a young man wants a business so much or wants a cage for a lady-bird so badly that he is induced to pay a rental for a farm exceeding by 10 or 20 per cent. its annual value, he has no one to blame but himself. If a young man lays out his money in permanent improvements, upon bad security, or upon no security at all, he has no one to blame but himself. Rotten props will let down men as well as buildings. I see great mistakes are made in attempting too large a business upon inadequate means. Now, though it is all very fine to be thought a great man in a small way, yet it is most undesirable to half-stock and half-farm any land. I do not object to a young man borrowing a small proportion of his capital at a reasonable rate of interest, but I know of no greater folly than attempting to farm 500 acres of land with capital barely sufficient for 300 acres. For profit and comfort there must be sufficient capital. Of course, let every young man

secure good land, good buildings, and a good landlord, with a principled agent, if he can; but if he cannot, if the supply is not equal to the demand, by all means let him make the best of those persons and things with whom and with which he has to deal. I recommend every young man to take the judgment of an experienced friend upon every point upon entering business, not only in the hire of the farm, but also in the purchase of the necessary stock and implements. I have seen many a young man, without much judgment or discretion, much imposed upon both at auctions and in private purchases. In the management of the farm do everything well and at the cheapest cost, and don't be afraid to calculate the cost to produce a crop, or the cost to rear or fatten an animal. I am sure we look at a farm too much in the mass, instead of calculating the items, whereby we unknowingly lose in one or more departments of our manufacture, for the want of investigation. Scrutiny leads to judicious and profitable outlay. Cultivate a thorough judgment of stock, for purchases 10 per cent. too dear and sales 10 per cent. too cheap are serious mistakes, and tell heavily against success in life. Young men must know by observation what constitutes a day's work: horses are expensive machinery, and if horses are kept well and worked 20 per cent. daily below par, whereby 20 per cent. of horse muscle is necessarily kept beyond the actual requirements of the farm, I say these again are serious losses. The manual labour, too, of a farm is necessarily a heavy outlay, and a master receiving 20 per cent. minus his due in labour is in an unfavourable position. Young masters must learn what constitutes a fair day's work for a fair day's wages, and see, too, that they get it. Also, in task work, a young man may be much imposed upon by paying a heavy per-centage beyond the value of the work performed. Both horses and men demand serious attention and consideration, with good supervision and direction. The work of the farm should always be forward, that it may be performed at the proper time and season. Not to make hay when the sun shines is mistaken economy. A man always just behindhand is not likely to overtake success. I most strongly recommend every young man annually to draw out a correct valuation of the live and dead stock, and of the covenants of the farm. I do it each year at October, and at the same time I draw out an actual balance-sheet of the annual returns and expenditure; and I urge upon every young man the necessity of doing the same. The more we are men of figures the more shall we be men of sound judgment, of deep research, and correct practice. Groping on in the dark has been the ruin of many a man. It is investigation which prevents a continuance in losses; and it is always wise to know the worst, and meet our difficulties, not by avoiding them, but by research, by action, and as men. I feel it to be absolutely essential for every young farmer to study the agricultural literature of the day. The Royal Agricultural Society's Journal must be carefully read, also the "Farmer's Magazine"; and it is highly important weekly to peruse the *Mark Lane Express* or *Bell's Weekly Messenger*, or some other good agricultural

paper, that young men may keep pace with the practical and intellectual progress of the age. Again, the Royal Agricultural Society's shows, and the other important and local agricultural exhibitions, are excellent opportunities for comparison, information, and improvement. To see other than home systems of farming is decidedly necessary to prevent local prejudices and those narrow notions which grow up under the shade of one's own barn-doors. I might say much upon the necessary amount of capital according to the character of the farm; also in recommending thorough draining, deep cultivation, autumnal fallowing, good stock, good manure, no false economy, and the like; but, in concluding my observations, I prefer to address a few remarks to young men themselves upon their own individual position and bearing. We cannot be blind to the fact that some men, upon their first start in life, make grand mistakes: they start with false views and false aims, and attain to a false position. In these days of ready credit, how many a man expends far beyond the limit which his income prescribes or warrants, in personal comfort or external show, in handsome furniture and house decoration, in first-class dog-carts, and other extravagances! Nor is this the worst: such a man usually resolves to cut a shine, be a swell, drive fast horses, attend balls, hunt, shoot, smoke and drink, give dinner-parties, ape superiors, and usually comes to grief. This is not a picture of plodding industry, and I have drawn an extreme case of folly, to warn young men without adequate means against such a life of tomfoolery. Success is based upon labour; and a slow, unpretending, economical start in life is a safe start. Let young men be content to earn their position and their luxuries before they assume the one or indulge in the other, or they will find to their cost that they end their life as they should have commenced it—in labour instead of competency, and that a life of youthful extravagance leads to a necessitous old age. Youth is not the time for self-indulgence and the jog-trot easy pace of indolence. Youth is the time for hard but substantial fare, hard every-day lodging and hard work. I am opposed *in toto* to the smoking, drinking, and pampering habits of young men in the present age. I am equally opposed to all the easy-chair habits and the semi-inaction far too common. As a young man I can knock on very well in life without much of the stimulants—beer, wine, and spirits, and without the enervating influence of tobacco and many other luxuries; and, what is more, I find myself better in health, better qualified for business, and better in pocket, without them. I am an advocate for moderation in everything; and I think it a strange thing indeed if a young man is not at liberty to decline to injure his health or his constitution because of the voice of public opinion. I especially urge moderation, as I observe young men make fools of themselves in their hours of excitement. I observe in the hour of excess deeds committed which entail an afterpiece of sorrow and regret; and how often the loss of character, of business habits, and of fortune may be traced to a wrong step here—to a departure from habits of temperance! I am no ascetic: I can be as happy as

any man in spirit; but I do not need either a narcotic nor an opiate to lull or to cheer me, and I am not prepared to fall down to that public opinion which makes venial the seed-bed of vice. Intemperance is the source of more than one-half of England's sorrows; and I warn the rising generation to flee her enticing calls. Safety here, and a young man of sense is proof against the foolish spree, secure from a youth-time of folly, and an old age of physical debility and mental repining. Some young men appear to consider the fast life a life of heroism, and a life wherein to glory. It leads to a life-time of shame; and how is society strewed with the wrecks of youthful intemperance, vice, and folly! No scriptural axiom is more true than the one embodying the fact, "That the world will speak well of thee so long as thou doest well unto thyself." I have said much upon temperance as a preventive to folly; but the only true safeguard is true Christian principle. Christianity is the fundamental basis of security; and shall I, who feel that I owe all that I have, all I am, and all I ever shall be, to its influence—I say, shall I lack the moral courage to assert its power? Shall I pass it by as a subject which has nothing to do with the business of life? shall I bow to the popular notion afloat in the world, that it is only fit for Sundays, and for elders when the fire of life has abated? Shall I admit that it has nothing to do with the discipline and the success of life? I came to tell you my experience; and, as a young man, I tell the young men of England plainly, I have found Christian principle as a thousand-horse power within a man, to cheer and to urge him onward in the path of duty. I hate the hypocritical cant and the jesuitical humbug which abounds. There always will be impostors in any age; but I know of no body of young men more imposed upon than those who wilfully determine to have nothing to do with true Christian principle upon any terms. True Christian principle is the highway to success in life; for while it prevents indolence, sloth, and extravagance, a waste of time and a waste of money, it excites to industry and economy, to uprightness of character, and rectitude of conduct. Are not those thus imbued—the men who prove Havelocks in their sphere?—men armed with moderation, patience, and endurance—men possessing promptitude and perseverance? Are not those the men who neither rack their bodies by excesses, or their minds by fear and feverish anxiety? Are not those the men intellectually strong in tranquillity, and physically strong from temperance? Are not those the men who are kind-hearted, courteous, considerate, and unpretending? Are not those the men who can control their tempers and their passions, and live above the jealousies, animosities, and envies which mar the happiness and peace of most men? They are; and, if such are the fruits of true Christian principle, are not such qualities and such fruits the essentials for success in life? are they not the essentials to secure a peaceful and a happy home? are they not the essentials to constitute a cheerful and a happy manhood? They are; and to every young man I recommend the bible as his chart, and, when Christian precept has become his practice, may it

be his good fortune to possess a sharer of his joys, to possess a helpmeet, amiable in temper, and kind in disposition; to possess a wife adorned with the ornament of a meek and quiet spirit, adorned with the beauty of love and the jewel of sense; and thus may they be mutually blessed, and prove blessings to all around them. In conclusion, a good education, thorough training and discipline, are the groundworks of success in life. Agriculturally those groundworks have been, and are at the present time, much neglected; and, though parental and social influence generally may do much to mould the character of youth, yet it is only by national combination and national exertion that the intellectual development, the scientific culture, and the mental discipline of the agricultural youths of England can be secured. And most strongly do I urge upon you, gentlemen, upon parents generally, and upon the kingdom at large, the necessity for action, the necessity for a well-developed plan of agricultural educational examinations; and such public examinations, I am convinced, would prevent the present waste of thousands of pounds annually in indolent and wrongly-directed efforts of instruction, and at the same time put aside the present incalculable loss of many of the most precious years of a young man's existence, extending from the age of 16 to 21 years—a loss, too, which cannot be estimated even by tens of thousands of pounds annually. And I long to see England made more great, more glorious, and more free by the improved intellectual culture and the improved mental discipline of the rising and future generations of Englishmen.

The Rev. C. T. JAMES, having been repeatedly called upon, said: His reason for responding was, that he desired as a clergyman to express his hearty assent to the Christian sentiments contained in Mr. Bond's introduction. If he were asked what kind of education were best, he should reply—that which taught a man to think best; and therefore he rejoiced that within a few months a resolution had been passed in that room to the effect that the advance of the arts and sciences in relation to farming had rendered improved education essential to the British farmer no less than to the British labourer. If, indeed, the education of farmers were not improved, what would soon be the position of the country? Agriculture was the chief source of the wealth and stability of the nation. They were essentially a corn-consuming people; and, although everyone must bid God-speed to commerce, manufactures, and trade, it was manifest that the community at large were mainly dependent on the advancement and prosperity of agriculture. There were 189,820 farms in England, comprising 78,000,000 acres, the rental of which was £127,000,000 per annum; and there were 800,000 families which were directly interested in agricultural pursuits. It was, therefore, manifestly of the utmost importance, in every point of view, that farmers should be educated in the truest sense of the word. It must be confessed, and he thought the clergymen were in some degree to blame for the fact, that in past times the education of farmers generally had been very inadequate to the requirements of their position. The middle-class

schools of education generally had been most unsatisfactory and incomplete. (Hear, hear). Moreover, farmers themselves were until recently comparatively indifferent with regard to the quality of the education obtained by their children. That excellent man, Dean Dawes, of Hereford, after remarking upon the jealousy of farmers on that subject, said he felt confident that the time was not far distant when the farmers of England would appreciate any sound effort at education quite as much as they then stood aloof from such efforts with suspicion and distrust. He congratulated the country that that happy period had now arrived. As regarded middle-class schools, however, which were those to which farmers must chiefly look for the education of their sons, it was still very difficult to find what was needed, owing to the incompetency of a large proportion of the teachers. Of the eighteen millions of inhabitants of this country, fifteen were dependent upon incomes under £100 a-year; and he thought that where there was no good middle-class school at hand, and there was a good national school under an efficient master, farmers would in many cases do well to avail themselves of the latter. The rudiments of a good education might, at all events, be obtained at many schools of that description. He trusted that in future the young farmers of England would never think their education complete unless they had learnt to manage stock, how to ascertain whether a farm was better adapted for breeding or for rearing stock, and what were the true characteristics and dispositions of different animals. He trusted that they would also pay attention to the question of stall-feeding and to the increased susceptibility to disease which it created; and that the result of their improved education would soon be that the farmers of England would soon assume that position in the social scale which they ought to assume, and would rank among the votaries of science.

Mr. R. BAKER (Writtle) said it must be apparent to everyone that the old adage that "education made the man" was as applicable to agriculture as to any other pursuit. The great defect was, that young men who were destined for agriculture, after leaving school did not devote a sufficient portion of the intermediate time, before they engaged in business on their own account, to their own improvement; and the result was that, instead of acquiring industrious habits in the avocations of the farm, they neglected agriculture, and became unfit for the performance of their duties. It was essential to the farmer that he should be able to tell not only how much work ought to be done by a labourer in a day, but whether or not work was done in a proper manner; and, if necessary, he should be able to take the tool in hand himself, and show how the operation ought to be performed. Moreover, he thought no young man should suffer a day to pass over without making some record of the occurrences of the day, including the state of the weather, and any other similar subject of observation which might occur to him (Hear, hear). Having been accustomed himself in early life to reduce his thoughts to writing, he had been struck on referring to them to see how far his views many years back differed from his present views; and he believed

that if farmers in general noted down what occurred to them, they would find the past obliterated as it were, or greatly modified, by the knowledge gained subsequently. The acquisition of knowledge must depend very much on the position and mental organization of the person who wished to acquire it. All men were not endowed with the same faculties, and had not the same opportunities of gaining knowledge; but it was men who pondered over what came under their observation who usually succeeded best in their avocations. Tusser, who wrote the "Five Hundred Points of Good Husbandry," when scarcely any agricultural work was in vogue, said a great many things which were as true in the present day as they were when he lived; but it was said of him that he was like a whetstone to a scythe, and that while he taught other men to cut, he himself remained blunt. He did not succeed as a farmer; and it was remarkable that the men who succeeded best as authors did not succeed as farmers, farming being an occupation which required the closest practical attention and more time than was compatible with such employment as reading and writing. (Hear, hear). Arthur Young was a very good writer; but he was considered one of the worst farmers of his day, and the reason was obvious, namely, that no man could be riding over the country observing the farming of others without neglecting his own. (Hear, hear.) If a man wished to flourish in any business, he should stick to it; if a man was determined to succeed as a farmer, he must be constantly at his post. He would recommend the young farmer to keep a common-place book, and to put in it headings on different subjects connected with farming, including the seeding and cultivation of the land, the management of stock, and the various modes of feeding stock. To these should be added a heading for meteorological observations. (Hear, hear). He had himself kept an annual register of the state of the weather from an early period of his life; and when men told him that never before was there such a season as this, he could point them to the winter of 1822-23, when there were only two frosts and no snow, and which was succeeded by one of the most abundant harvests ever known. It was, he conceived, by such means as he had mentioned, that success was most likely to be attained, and he believed that in farming, as in any other occupation in life, there was no difficulty that might not be overcome if it were met in a proper manner. (Cheers).

Mr. W. WALTON (Alton), said, that Mr. Bond had so ably brought forward the subject for discussion, there was but little left for him to say upon it; however, with respect to agricultural education, the motto of the Royal Agricultural Society up to the grand show held at Southampton was, "Science with practice;" then the late noble Lord Althorp, knowing that practice was the leading feature of agriculture, changed the toast to "Practice with science." The managers of the Royal Agricultural Society of England no doubt thought they did well when they gave the renting farmers an opportunity of educating their sons at a cheap rate in the College at Cirencester. At first the terms were £30 a-year, after a few years the expense became £60, and

subsequently it was raised to £90 or £100 per annum. The result of which was, to exclude the vast majority of tenant-farmers' sons from the benefit of the institution; he took it that it was now meant solely for the education of the sons of landholders and their stewards. The Rev. Mr. James said, on education, there were excellent village schools where farmers' sons could get a good and cheap education. Mr. Walton warned his brother tenant-farmers on no account to allow their children to be educated at a village charity school. He had no pride about him; still he did not see why the sons of farmers should be put in such a position that his shepherd and labourer might be able to say that their sons had been brought up with, and were as well educated as the farmer's sons. He was as desirous as any man of seeing the sons of renting-farmers better educated. Mr. Bond had proved to them the necessity of better education and discipline for young farmers, and partly shown them the way to accomplish it; but instead of educating them at a village charity school, he (Mr. Walton) would show them the way to give their sons the very best education at a small cost. The farming community of England was supposed to employ capital to the amount of six hundred millions. With such a capital are farmers' sons to be educated and classed with labourers' sons? It is calculated that the rent of meadow and cultivated land is about 35,000,000; 1 per cent. per annum would be £350,000—a fair capital to begin with; in twenty years at common interest, seven millions. If they were united and would support the fund that he recommended, they could not only clothe and educate the orphans of farmers, but every one of their children could have the very best education at the least possible cost.

Mr. J. C. NESBIT (Kennington) was of opinion that there was a distinct line of education which ought to be recommended for agriculturists. He was not then referring merely to pecuniary cost, because as education advanced, the class of persons competent to give the sort of instruction that the farmer most wanted would increase, and thus the expense would be diminished. As regarded the education of young men who were destined for agricultural pursuits, it must be clear to all present that it should commence with the laying of the foundation, consisting of those moral principles which ought to govern men in their every-day life (Hear, hear). Without these as a basis, he believed that any superstructure of mere intellectual knowledge that might be raised would be most insecure (Hear, hear). Religious instruction, therefore, should constitute the foundation of every system of education. This should be succeeded by the gradual culture of the mind, and habits of observation and reflection. Observation came first in order. A child, whether intended for agricultural or for other pursuits, ought to have his powers of observation first brought into action by placing various objects before him, and letting him exercise his natural faculties in marking their quantities and sorts. To understand the difference, for example, between a pebble that was round and one that was square was no doubt in itself a small and insignificant thing; but it was such minutiae as that

which lay at the very root of sound education (Hear, hear). As that went on, the child intended to be educated for agricultural pursuits should be instructed in the nature of the various objects by which he was surrounded on the farm. He ought to be taught something about the direction of the strata and the nature of the soils which he might meet with: something of their chemical properties, and those of the water that fell from the heavens; of the air he breathed; of the effect of keeping the ground untilled and of tilling it, and exposing it to the action of the air; something of the nature of plants, not only those which he would have to cultivate, but also those which he would have to root up and extirpate; in short, something of the natural properties of everything with which he would have to do when he became a farmer. It did not follow that he need be a perfect geologist, chemist, botanist, and philosopher; but he should possess sufficient knowledge to enable him to understand the works of those who entered more deeply into philosophical inquiries than the farmer could be expected to do, and thus to appropriate to his own use the information supplied by other people. With this education there must, without doubt, be combined a good knowledge of arithmetic, and an acquaintance with mathematics to the extent of mensuration and surveying, so far as means would allow. All this might be furnished at schools; though it was not done generally, at present, simply because there were not a sufficient number of men so educated as to be capable of disseminating such knowledge. The time would, he believed, speedily arrive when, with the means that were being adopted for the purpose, a sufficient body of teachers would be provided, and then the objection on the score of expense, to which Mr. Walton had referred, would be removed, and the education for which farmers were now paying £100 a-year would be got for £25. With regard to the subsequent education, he thought it must be perfectly clear to every gentleman at all acquainted with practical agriculture, that an attempt to teach practical farming in an educational establishment would be just as absurd as an attempt to teach civil engineering at Oxford (Hear, hear). They must educate the boy, so as first to give him his general knowledge, and then the special instruction necessary for the business which he had to follow; and it is always desirable to send him to a practical man to learn the business itself. Our forefathers were well acquainted with this kind of necessity, when they used to apprentice their sons for seven years, not merely that they might acquire a knowledge of their business, but that they might get disciplined in it. No man could take up an art, and practise it successfully, without first going through the whole of it, so that afterwards when he came to act on his own responsibility he would be able to say, "I know how to do this, and I know how to do that, for I have seen it done before, and have done it myself." The education of the boy in the art of agriculture ought to be separated from the scientific portion of his education. First, there should be a good general education; then there should be founded upon that as much acquaintance as possible with those sciences

that every man ought to be versed in who was engaged in agriculture; for, of all employments in this world, a man requires in this the largest amount of business-knowledge and application. Afterwards should come the education in practice under a practical farmer, to form the superstructure. Without this no man, scarcely, could ever become a good practical farmer. These remarks were the result of long and close observation on his part. When he first turned his attention to agricultural subjects, he found it necessary to leave his laboratory behind him, go into the country, and study under a farmer's as an agricultural pupil.

Mr. S. SIDNEY (Kensington) said he had now had the pleasure of listening to three papers by Mr. Bond, the two first of which were certainly among the most useful as well as able and eloquent essays that he had ever listened to in that room. He was sorry, however, that he could not express himself quite as favourably of the last, which, although it was equally well written, was wanting in those practical suggestions which distinguished its predecessors. In the first place, in severely criticising, not without justice, the ordinary course of education open to the young farmer, Mr. Bond had fallen into the mistake of condemning the system when the chief blame lay with the educators. The great misfortune of the farmers was that there had not been open to them a useful class of schools, and that they were in reality furnished only with chance teachers. With regard to classical learning, he did not know anything that would facilitate a knowledge of the exact sciences more than the acquirement of Greek and Latin; but the farmers had paid for classical learning, and their sons had learnt neither that nor anything else. (Laughter). What farmers wanted was that education should be brought home to their own door; and he believed that if they took advantage of the education which certificated schoolmasters were now getting, and formed themselves into associations for the support of schools conducted by such men in their own neighbourhood, they would be able to command an education that was at once good and cheap. He also thought that the farmers who had sons to bring up should lay in a store of books to which the young men might always have free access. As to the system of competitive examinations, if they employed that gauge to practical employments, the results would be deceptive. The schoolmaster would naturally be encouraged to take pains with boys who were clever, whilst he neglected those who were not; and the result would be, that they would get a small number of boys who had distinguished themselves, and a large mass who had been left behind in despair. The great object of education should be to educate the whole class, and that could not be done by means of honorary rewards, which had been well designated by the Bishop of London as that sort of certificate which a man carried about in his pocket, and which nobody wanted to see. One of the great arts of a farmer should be the power of observing, and the ability to record the results of his observation. There was nothing like keeping a journal; it was one of the most admirable methods of self-education, and cultivated the mind to a degree

of which they could hardly form an idea. (Hear, hear).

Mr. DAVISON (Croydon Farmers' Club) said that for the intelligence which they possessed, farmers were chiefly indebted to the schoolmasters who had been cried down on that occasion. He took that opportunity of standing up in vindication of the schoolmasters of Great Britain. He had associated with them extensively, and he knew that they were anxious, as a class, so to educate the children entrusted to their care that they should become good practical men. In the Utopian principles which had been propounded that evening by Mr. Bond he certainly could not concur, as he thought they were incompatible with making a youth a good farmer. For his own part, he regarded the father as the principal teacher of the boy, if farming was to be his business; and he thought it might be safely left to themselves, without the intervention of colleges, to bring up their sons in a manner worthy of the race of English yeomen. The rising generation of farmers he considered a fine example to the world at large. He could readily make allowances for their love of field-sports. They had little society in their own neighbourhoods; and such amusements supplied them with necessary and healthful recreation and relaxation from toil (Hear, hear). When at home, they studied history and science; and his whole experience taught him that they were a highly scientific class of young men.

Mr. NOCKOLDS (Stansted, Essex) concurred in the opinion that the power of observing and recording facts and phenomena connected with agricultural pursuits was a most valuable portion of a farmer's education. He remembered that, when he quitted school, and was placed out to learn his business, his master would, as opportunities occurred, point out particular trees, explaining their distinctive characteristics, and the purposes to which the timber might be applied, and make other observations relative to familiar objects, which he could not fail to treasure up in his mind; and he believed that he had acquired more information by these practical means than he could have done by any amount of mere theoretical teaching. He had two sisters, who were both older than himself, and who exercised a sort of double Queen Victoria power over him. They were very clever, and were well versed in chronology from the days of Adam down to the present time. In short, they knew everything (laughter). On one occasion, the conversation happening to turn on Henry the Eighth's wives, he had forgotten what was their number, and could only recollect that he was brute enough to cut off the heads of one or two of them. "Don't you know how many wives he had?" was the question. "No, I don't," he replied; "but do you see that little bird?" "Yes." "Do you know what it is?" The young ladies confessed they did not. "That," he rejoined in triumph—"that is a hen-chaffinch; and I think, my dears, you had better make the acquaintance of the common things by which you are surrounded, than trouble yourselves about Henry the Eighth and his wives" (Hear, hear, and laughter).

Mr. W. FISHER HOBBS (Boxted Lodge, Essex), thought that upon the whole Mr. Bond's paper did him very great credit, and was calculated to promote the cause of education amongst the agricultural classes (Hear, hear). There were certainly one or two points which he should like to have seen treated more amply. There was also one upon which he could not altogether agree with Mr. Bond: he alluded to a knowledge of the dead languages. He (Mr. Hobbs) had always been of opinion that "knowledge was power," and he believed that a man could not have that knowledge of the sciences which was necessary at the present day in connection with agriculture, unless he had some acquaintance with those languages which taught him to understand the derivation of the words generally made use of. He considered it necessary, in the present day, that young men should be educated in one or more of the dead languages; most certainly was this the case as regarded Latin. Not less valuable, however, would be a knowledge of modern languages, especially of French, if not of German. If English agriculturists wished to meet in the first classes of society, a knowledge of French, as well as of Latin, was absolutely essential. The more education a farmer could give his son between the age of 6 and 16, the better. There was a time, however, when with scholastic training the farmer must combine attainments in various agricultural sciences, which, in his judgment, were better acquired at a college like Cirencester than anywhere else. After leaving such an establishment as that, and proceeding to learn practical agriculture, the youth should begin by putting his hand to the plough (Hear, hear). When he (Mr. Hobbs) left school, he was taught to go through every department of practical farming (Hear, hear). His complaint in after life to his father was, that he had not made him a better ploughman. He certainly could plough a furrow or a stretch in a superior way; but to the present day he could not, if a man were not ploughing in the best manner, jump off his horse and show him how to do it (Hear, hear). There were various other branches of practical farming that he had been taught, and was fond of; and among these was the treatment of diseases in horses, cattle, sheep, and pigs (Hear, hear). He held that a young man was not degraded by being able to bleed a horse, shear and slaughter a sheep, or administer medicine to his stock (Hear, hear). Indeed all such practical knowledge was, in his opinion, necessary in the case of a farmer occupying a first-class position in the present day, and with application and reading he would of course be all the better. With regard to his friend Mr. James's remarks, he thought they had not been taken exactly in the way in which they were intended to be understood (Hear, hear). What he understood Mr. James to say was, that if in the rural districts there were not middle-class schools at a convenient distance for the sons of practical farmers, they had better be educated in the national schools, the same as in Scotland, where the sons of the farmer and the trader were educated together; for education they would have, and, if they could not acquire it in their own neighbourhood in any other way, they went to a national

day-school. Education was now an absolute necessity, and there was no pursuit in life that more demanded it than practical farming (Hear, hear). Moreover, the farmers enjoyed beyond all other men the great advantage of being ever in the presence of the glorious works of Nature; and education would afford them the means of looking "through Nature up to Nature's God." (cheers).

The Rev. Mr. JAMES explained what he had intended with regard to the schools to be selected for farmers' sons. It was calculated, he said, that out of the eighteen millions of population in this country, no less than fifteen millions were in the receipt of incomes of less than £100 per annum. There was great difficulty in finding good teachers in middle-class schools, and he thought that where a person's income was under £100 per annum, and there was no good middle-class school in the neighbourhood, that person should set aside all feelings of false pride, and avail himself of the good national schools which were now to be found in every district, conducted by practical certificated masters, and thus consult the welfare of his children rather than his own dignity (cheers).

Mr. BOND then replied. He said gentlemen were mistaken in supposing that he undervalued the classics; but he did not see how farmers' sons were to learn all the classics as well as all the sciences which bore particularly upon agriculture (Hear, hear). He had no hesitation in saying that he believed the sciences were the more useful, and that one pound of science was worth ten pounds of classics (Hear, hear). His chief object in recommending the examination of boys at sixteen was, that it might be a means of ensuring a better class of schoolmasters. He had stated that the fault did not rest with the schoolmasters, but with the farmers themselves, who had not openly pronounced in favour of a better education for their sons. He hoped the discussion of that night would be a seed-bed for the future. He was not irrevocably wedded to his own plan—all he said to them was, "Do something: don't remain in a state of inaction on this important subject. Any step which you take with prudence and judgment can scarcely fail to be in the right direction" (Hear, hear).

On the motion of Mr. Baker, seconded by Mr. Sidney, a vote of thanks was accorded to Mr. Bond for his paper; and with a similar acknowledgment to Mr. Trethewey for presiding, the proceedings terminated.

WHOLE BARLEY AND SALT PROVED VERY HEALTHY AND FATTENING WHEN GIVEN TO SHEEP UPON COMMON WHITE TURNIPS.

SIR,—We are living in the great age of discovery, not only in artificial manures, food for cattle and sheep, implements in husbandry, but in every branch of agriculture. If memory serves me rightly, about the year 1852 Mr. William Dainty, of Euston Heath, near Stamford, was giving his sheep at turnips whole barley heavily mixed with salt, the said shearing sheep having been bought

in a lean state about Michaelmas, and had got fat upon barley, salt, and turnips by the beginning of March, when I saw them greedily eat the barley and salt. The sheep were much healthier with the salt than without it. Mr. Dainty said that he had tried oilcake and turnips, and heas and turnips, and it was his opinion that the sheep gained the most weight upon barley and salt. Mr. Dainty at that time considered that the barley being of a binding nature was more suitable with the white turnips. Here we are at a loss to know the cause, for the want of knowing agricultural chemistry. We may know that sheep thrive better on one kind of food than another, but

we know not the cause. We can weigh the sheep alive, and the food as they consume it, and the food which produces the most in meat and wool at the least expense per pound is the best and cheapest food to feed with. Is it not advisable, when wheat is the cheapest, to mix the barley with wheat, still using the salt for health? Mr. Dainty has proved that the more mutton he sends to London, the more corn per acre he can sell in Stamford market. I need not add that Mr. Dainty is a farmer of the first class.

SAMUEL ARNSEY.

Mull Field, Peterboro', March 10th.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

WEEKLY COUNCIL, Feb. 23.—Present, Sir Edward Kerrison, Bart., M.P., in the Chair; Mr. Barrow, M.P., Mr. Simpson, Mr. Burch Western, and Mr. Sutton Western, M.P. Mr. Noah West addressed a letter to the Council for improvements stated to have been made by him in the Reaping Machine, and requesting the Society to aid him in carrying them into operation. Mr. Kitto transmitted a sample of white Wheat brought by him from California, which was referred, with his letter on the same subject, to the Monthly Council, March 2.

Adjourned to March 2.

A MONTHLY COUNCIL was held on Wednesday, the 2nd of March; present His Grace the Duke of Marlborough, in the Chair; Lord Leigh; the Honourable Colonel Hood; the Honourable W. G. Cavendish, M.P.; Sir Charles Morgan, Bart., M.P.; Sir J. V. B. Johnstone, Bart., M.P.; Sir Edward C. Kerrison, Bart.; Mr. Acland; Mr. Amos; Mr. Raymond Barker; Mr. Barnett; Mr. Hodgson Barrow, M.P.; Mr. Barthropp; Mr. Caldwell; Colonel Challoner; Mr. Exall; Mr. Brandreth Gibbs; Mr. Hamond; Mr. Fisher Hobbs; Mr. Hoskyns; Mr. Hudson, of Castleacre; Mr. Kinder; Mr. Lawes; Mr. Milward; Mr. Pain; Mr. Pope; Professor Simonds; Mr. Torr; Mr. Turner, of Barton; Professor Voelcker; Mr. Jonas Webb; Mr. Burch Western; and Mr. Marshland Wilson.

The following new members were elected:

Baxendale, Richard Birley, Whetstone, Herts.
 Caless, William, Bodicote House, Banbury.
 Charlton, St. John, Beaumaris.
 Crawley, John Latham, Hutton, Shiffnall.
 Hay, G. W., Sudbury, Derbyshire.
 Margetson, James, Manor Farm, Sheldon, Alton.
 Meyer, Herman, Little Laver Hall, Ongar.
 Peel, George, Brookfield, Cheadle.
 Oakley, Richard, Lawrence End, Herts.
 Rome, Thomas, Groundslow, Stone, Staffs.
 Ross, James, Hinwick House Farm, Wellingborough.
 Smith, Martin Tucker, M.P., 14, Upper Belgrave-street.
 Soulbly, H., Malton.
 Tomlinson, John Edward, Whitback, Ludlow.
 Ward, Robert, Sodstone Hill, Narbeth, Pembroke.

FINANCES.—Mr. Raymond Barker, Chairman of the Finance Committee, presented the monthly report on the accounts, from which it appeared that the current cash-balance in the hands of the bankers was £2,571.

GOVERNORS' PRIVILEGES.—On the motion of Mr. Raymond Barker, seconded by Mr. Milward, it was referred to the Finance Committee to consider, and report upon at the next Monthly Council, the most suitable means by which Governors of the Society may in future have the privilege, on a certain payment, of continued ingress and egress into and out of the Show-yard of the Country Meeting.

VETERINARY INSPECTION.—On the motion of Mr. Pain, seconded by Mr. Torr, Professor Spooner, Principal of the Royal Veterinary College, was unanimously requested to accept the appointment of Joint Veterinary Inspector, with Professor Simonds, at the annual country meetings of the Society.

WARWICK MEETING.—Lord Leigh, Vice-Chairman of the General Warwick Committee, reported the recommendation of the Committee, that the Council should accept the offer of the Local Committee at Warwick to defray the expenses connected with the exhibition of cheese. His lordship also reported that the ground for the site for the show-yard had been drained and levelled at the expense of the authorities at Warwick, and was now in a suitable state for the operations of the Society's contractor. The Local Committee addressed a letter to the Council, containing a resolution, "not to have a dinner at the Warwick Meeting." Mr. Fisher Hobbs intimated that he should have a proposal to submit to the Council at the next Monthly Meeting, in reference to new arrangements by which he considered that a dinner might advantageously be given. Additional Prizes for Short-horned, Hereford, and Devon cattle were included by the Council in the Live Stock Prize Sheet for the Warwick Meeting, which was then considered to be finally settled, and its publication ordered to be made in the usual manner.

COUNTRY MEETINGS.—Mr. Raymond Barker, Chairman of the Country Meetings' Queries Committee, laid on the table a proof of the amended and more commodious form in which the schedule of queries should in future be arranged. He also suggested seven of the principal towns in the district for 1860, comprising the counties of Kent and Surrey, with the authorities of which the Secretary should enter into communication in reference to the place of the country meeting of next year.

MEMBER OF COUNCIL.—On the motion of Mr. Hudson, of Castleacre, seconded by Mr. Wren Hoskyns, Lord Leigh was unanimously elected one of the Members of the Council, in the place of Sir A. K. Macdonald, Bart.

CALIFORNIAN WHEAT.—Sir Edward Kerrison, Bart., M.P., offered to undertake the trial of the white Californian Wheat placed at the disposal of the Council by Mr. Kitto, who stated that he had himself grown of that Wheat "a hundred bushels to the acre."

The Council then adjourned (for a fortnight) to Wednesday, March 16.

WEEKLY COUNCIL, March 16.—Present: The Hon. W. G. Cavendish, M.P., in the chair; Mr. Alcock, M.P., Mr. Camps, Mr. Devas, Rev. L. Vernon Harcourt, Mr. Majendie, Mr. Simpson, Mr. Wilson (of Stowlangtoft), and Mr. Maitland Wilson. Communications were read from Mr. Thomas Crisp, Baron Nathusius, and the Count de Gourcy, on the advantages of cultivating the Lupines, especially the yellow-flowered variety, on the blowing sands respectively of Suffolk, Prussia, and the North of France, as food for sheep.

The Council referred these communications to the consideration of the Journal Committee.

Adjourned to March 23.

WEEKLY COUNCIL, March 23.—Present, Colonel Challoner, Trustee, in the Chair; the Hon. W. G. Cavendish, M.P., Mr. Raymond Barker, Mr. Hodgson Barrow, M.P., Mr. Berners, Mr. Brandreth Gibbs, the Rev. L. Vernon Harcourt, and Mr. Majendie. Communications were read:—1. From Mr. Rutherford, detailing his experiments in the cultivation of Potatoes by spreading sea sand over them on light and heavy land, with and without manure. 2. From Mr. Paston, giving the result of his trials in growing Barley on light soil with a sandy gravelly subsoil, ploughed at 6 and subsoiled to 13 inches deep in each respective case, the yield in straw and grain being greater in the land not subsoiled. 3. From Mr. Birnie, suggestions for the collection of results in turnip cultivation and its failures. 4. From Mr. Charles Chapman, of Folkestone, details connected with Bray's Traction Engine.

Adjourned to March 30.

FOOD FOR FATTENING CATTLE AND SHEEP.

SIR,—We are now living over the middle of the nineteenth century, and in the wonderful country for agriculture, nay, and in the gigantic age of discovery, and yet we know not the proportionate strength of wheat, barley, beans, peas, oats, tares, &c., in the feeding of cattle and sheep, &c. Not knowing the power of each, we know not which is the cheapest to feed with. If asked, Is a pound of barley per day for a sheep equal in strength to a pound of wheat? or, What is the difference? Is a pound of beans equal to a pound of the best oilcake? In what proportion is a pound of tares to a pound of peas or oats? &c.

In my opinion a great deal is yet to be one by mixing

corn, &c., such as mixing wheat with barley. Of course mix that which is opening with that which is binding, and the food which is too hot mix with that which is colder; and that which is too strong mix with that which is weaker. But do not mix good food strong enough with that which is weak and worthless, merely mixed to sell and not to fatten. Get such adulterated food analysed. Common sense dictates to the British farmer far and wide, and boldly says feed your cattle, sheep, and swine with the corn you grow upon your farm. You grow the strongest of food to feed with, but you know not how to mix or apply it. By using what you grow you save the carriage of bought food and the carriage of your own corn out. The more of your home-grown corn you convert into meat the more corn per acre you will grow, and the less artificial manure you will require. The best artificial manures have done wonders, whilst some of them have proved worthless. It is wisdom to have all proved by chemistry. The old adage says, "There are none so blind as those who will not see." There is the *Mark Lane Express* and the *Farmer's Magazine* to enlighten them, and to guard them against adulterations and impositions in agriculture. But it is as it was and always will be.

He who is above being taught or told,
There are no hopes in him whether young or old.

SAMUEL ARNSBY.

Mulfield, Peterborough, March 23, 1859.

GREAT CATTLE SALE AT BLENCOW.

On Tuesday, March 8, the sale of the entire herd of short-horned cattle belonging to John Ewan Troutbeck, Esq., took place at Blencow, about seven miles from Penrith. The weather was fine, though cold; the attendance very large; we heard the numbers present estimated at from fifteen hundred to two thousand, and among them buyers from all parts of the kingdom, and some from a greater distance still. Mr. Srafford officiated as auctioneer. The scene of action was a field immediately adjoining Mr. Troutbeck's house. The catalogue enumerated 35 lots of cows and heifers, and 7 bulls. Prefixed was a notice that Mr. Troutbeck laid the foundation of his herd forty years ago by the purchase of the Strawberry tribe from Mr. Curwen, of Workington Hall, by whom the sort was obtained from General Simpson's herd, which were directly descended from that of Mr. Colling of Ketton. Nell Gwynne, first on the list, was bought of Mr. Wood, of Kimblesworth, in 1820, and came from the dam of his far-amed bull St. Albans (1412), which cow he purchased at Sir H. V. Tempest's sale at Wyuyard in 1813; she was from his famous Princeas, bred by Mr. R. Colling, of Barumpton. They have since been regular breeders, and highly fortunate, excellent milkers, and not forced for the present sale. The whole were bred on one farm, except the Duke of Cambridge (12747), to which bull the cows and heifers are principally in calf. There were in all 14 of the Strawberry and 27 of the Gwynne tribes. The cattle were brought to the auctioneer in splendid condition, and did as much credit to Mr. Troutbeck as the ample collation laid out in a barn fitted up for the occasion did to the lady of the mansion and her subordinates. The competition was brisk, and the sale rapid, realising a sum total, it will be seen, of considerably better than two thousand guineas; and the following were some of the best prices fetched:

Sukev Gwynne, red, calved in 1849; got by St. Thomas (10777), dam Sal Gwynne, by Prime Minister (2456).—74 guineas.

Polly Gwynne, red roan, calved in 1850; got by Sir Harry

(10819), dam Pricky Gwynne by St. Thomas.—91 guineas. (Mr. Thompson.)

Frances Gwynne, white, calved in 1854; got by Capt. Har-
dine, dam Fanny Gwynne by St. Thomas.—85 guineas. (Mr.
Robinson.)

Flora Gwynne, roan, calved in 1855) got by Young Bened-
dict, dam Fanny Gwynne by St. Thomas.—80 guineas. (Mr.
Howard, Bedfordshire.)

Sophy Gwynne, roan, calved in 1855; got by Young Bened-
dict, dam Sophia Gwynne by St. Thomas.—81 guineas.

Phoebe Gwynne, red roan, calved in 1856; got by Young
Benedict, dam Pricky Gwynne by St. Thomas.—70 guineas.

Prim Gwynne, light roan, calved in 1856; got by Young
Benedict, dam Polly Gwynne by Sir Harry.—150 guineas.
(Mr. Douglas, Athelstaeaford, East Lothian.)

Silver Gwynne, white, calved in 1856; got by Young Bened-
dict, dam Sukey Gwynne by St. Thomas.—75 guineas.

Priscilla Gwynne, roan, calved March 12, 1858; got by
Duke of Cambridge, dam Polly Gwynne by Sir Harry.—125
guineas. (Mr. Thompson.)

Miss Maggy Gwynne, roan, calved March 28, 1858; got by
Duke of Cambridge, dam Patty Gwynne by Young Benedict.
—110 guineas.

Rex, roan bull, calved March 10, 1858; got by Duke of
Cambridge (12747), dam Sukey Gwynne by St. Thomas
(10777).—66 guineas.

Omega, rich roan bull, calved Feb. 7, 1859; got by Duke of
Cambridge, dam Polly Gwynne by Sir Harry.—37 guineas.

Realized—For cows and heifers, 1,883 guineas; for bulls,
290 guineas. Total, for the cattle, 2,173 guineas.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR MARCH.

Throughout the month the weather in all parts of the United Kingdom has been remarkably fine for the time of year, consequently vegetation generally has made steady progress, and the wheat crop has become seasonably forward. Not that any complaints have come to hand to the effect that the plants have grown too rapidly, or that they have assumed an unhealthy appearance; on the contrary, they are described, with scarcely an exception, as giving earnest of an early and abundant harvest. Notwithstanding the splendid prospect of the growing crop in this country, and the heavy stocks left over from last year, both here and in France, there has been rather more firmness in the demand for wheat in the whole of our leading markets, and fine samples have advanced fully 1s. per quarter. This advance has, no doubt, resulted from the unusually small shipments of food now making from the United States, and the comparatively high value of both wheat and flour at the various shipping ports. There has, however, been no disposition shown by our millers to increase their stocks, and the speculative operations have been of a trivial character. Whatever may be said of the effects likely to be produced by a great alling-off in the exports from American ports, we must not forget that our farmers still hold large quantities of wheat, and that the supplies of produce in France is *in excess* of many former seasons. These two most important features in the trade have naturally induced great caution amongst our millers in purchasing beyond immediate wants. But here we may observe that, for some time past, complaints have been pretty general of a falling-off in the sale for bread, even in the best localities. This decline in the consumption may, in some measure, be attributed to the large supplies of potatoes which continue on offer in excellent condition, and the low quotations at which they are selling. Again, rice is still competing with wheat, with a very large stock on hand both in London and at the outports. Whilst this state of things lasts, and whilst we are threatened with heavy shipments of both wheat and flour from the near continental ports, especially from France, we can scarcely anticipate active markets for wheat, even though moderate quantities may, from time to time, be shipped from Liverpool to New York. The supplies forwarded during the month just concluded are about 5,000 quarters, which, at present rates, will yield a small profit, after deducting charges and the expenses of freight.

The value of flour in our markets is now on a par with last year, the best town-made being quoted at 40s. per 280 lbs.; whilst the best French may be purchased at about 7s. under that quotation. The cheapness of money, the increase in our

export trade, and the comparative firmness on the part of some of the holders of good wheat in the north of Europe, have failed to give any impetus to the transactions in flour. Fine barley, however, has continued scarce, and very firm; but grinding and distillery sorts have ruled heavy, and prices have had a drooping tendency. In the value of other produce very little change has taken place, and the demand has been far from active.

The wool trade—owing chiefly to the uncertain state of politics on the continent—has been much less active; nevertheless, the quotations have been fairly supported. One cause of the inactivity in the biddings at the last public sales of colonial wool, held in London, is the effort now making in France and Holland to compete with us for direct importations from Australia. Auctions of wool from our colonies have been held both at Amsterdam and Rouen during the progress of those in the Metropolis, and the consequence has been, that very few foreign buyers have made their appearance; so that the bulk of the wool—certainly nine-tenths of the supply offered—have been taken by our own manufacturers. How far this opposition will succeed is uncertain; but we much doubt whether even Government premiums on full cargoes of colonial wool will render it profitable for foreign houses to compete with us for wool in the great producing markets of the world, such as Australia and the Cape.

The supplies of winter food have turned out better in quality, and larger in quantity than had at one time been anticipated. Hay continues plentiful, at from £2 15s. to £4 12s.; clover at £4 to £5 8s.; and straw at £1 5s. to £1 9s. per load. These remarks and prices, however, refer more particularly to the Metropolis and its neighbourhood, because in some of the Midland counties a positive scarcity exists, and prices rule comparatively high. On the continent, likewise very little hay is on hand, and the consequence is, that live stock in the North of Europe has considerably decreased during the winter months; hence, it is most probable, that our importations of cattle from Jutland, between this and the end of September, will be on a very moderate, perhaps a limited scale. The high prices of both beasts and sheep, and the prospect of very little decline in them—the result, possibly, of increased prosperity amongst the great consuming classes—together with an assumed shortness of supply in the large grazing districts, as well as in Scotland—will, no doubt, induce the foreign breeders and feeders to ship to their utmost, even though the currencies abroad are higher than for many years past.

The sowing of Lent corn is now progressing rapidly. In most quarters the land is in first-rate order, consequently the seed is being sown under most favourable auspices.

Most of the Scotch markets have been tolerably well, but not to say heavily, supplied with wheat. For most kinds the demand has ruled somewhat firmer, and prices have had an upward tendency. Fine barley, oats, beans, and peas have changed hands, at fully previous currencies. The yield of produce, last year, especially wheat, in Scotland, was, we believe, a large one, and the return of other grain was apparently in excess of 1857, judging from the extent of the shipments made from time to time to the south. For the most part the barley and oats have arrived in first-rate condition, and, consequently, have commanded the highest prices paid at Mark Laue. This excess in the supplies, and the large extent of the potato crop, have, of course, had considerable influence in the trade throughout England, as well as throughout the United Kingdom, and it has, in a great measure, tended to counteract the influence which the high prices in the United States would have had upon our quotations.

Compared with several previous months, the grain trade in Ireland has exhibited more firmness. In prices, however, no quotable improvement can be noticed. The exports have been on a limited scale, not only to London, but likewise to Liverpool; but the imports from the westward have continued seasonably large.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

In a comparative sense, the supplies of beasts on sale in the Metropolitan market, since we last wrote, have been on a very moderate scale, and in but middling condition. During the first three weeks of the month, the demand for all breeds was active, at enhanced quotations; but during the last week, owing to large arrivals of meat up to Newgate and Leadenhall, both from Scotland and various parts of England, the trade became much less active, and prices had a drooping tendency. The arrivals of sheep may be considered tolerably good, but by no means extensive; and the mutton trade has been decidedly active, at high currencies, some of the best old Downs in the wool having realized 6s. per 8 lbs. On the 28th of the month, however, the quotations gave way 2d. to 4d. per 8 lbs., and the demand was decidedly heavy. The transactions in lambs have been only to a moderate extent, and prices have ranged from 5s. 8d. to 7s. per 8 lbs. Calves and pigs have met an improved request.

Complaints have reached us from various quarters in reference to the scarcity of both beasts and sheep, even in the best localities. We believe, however, that the deficiency in the supplies has been somewhat overstated, although we may safely conclude that we shall not see meat much cheaper than it now is for a considerable period. The question which at no remote day will occupy the attention of most parties will be, What, in reality, has produced the so-much-complained-of scarcity? in other words, is it the result of extensive and injudicious crossing—the wholesale slaughtering of young animals—or the immense consumption? The destruction of young stock we believe to be the principal cause of the comparative scarcity, because, as yet, we see no reason to suppose otherwise than that crossing has produced an increased quantity of meat; and we may further observe—looking to the actual supplies disposed of—that consumption does not appear to be on so large a scale as is somewhat generally supposed. Of one thing we may rest assured, viz., that very high prices will check the demand for butcher's meat, and that all who are now buying store animals at those quotations have the pros-

pect of a loss before them. True, we cannot expect to receive large supplies of either beasts or sheep from the Continent, and, as regards the latter from Germany, *via Hambro'*, their weight is too small to give any effect to the trade.

The Norfolk beasts received into London have not equalled some former seasons, either as regards number or quality; indeed, this year much disappointment has been expressed by the buyers in this respect. No doubt the long drought during the summer last year materially interfered with the fattening properties of each kind of stock. Those from Scotland, however, have come to hand in first-rate condition; and amongst the supplies we have noticed some excellent crosses from Morayshire, into which part of the country the shorthorns have been largely introduced. The health of the stock has continued good, and very few losses have been sustained by disease. We may observe, however, that about 200 beasts received from Holland have been seized by the Customs authorities, and condemned as unfit for human consumption.

The importations into London during the month have been as follows:—

Beasts	1,304 head.
Sheep	8,860 "
Calves	384 "
Total	10,548 "
Same time in 1858	1,511 "
" 1857	5,419 "
" 1856	1,842 "
" 1855	2,103 "
" 1854	8,409 "
" 1853	10,884 "
" 1852	6,747 "

The total supplies exhibited in the Metropolitan Market have been—

Beasts	16,810 head.
Cows	612 "
Sheep and lambs	94,775 "
Calves	695 "
Pigs	2,890 "

COMPARISON OF SUPPLIES.

March.	Beasts.	Cows.	Sheep.	Calves.	Pigs.
1858.....	17,821	476	74,410	704	1,915
1857.....	17,345	490	74,880	1,118	2,230
1856.....	22,623	470	100,700	797	2,140
1855.....	18,644	380	88,790	835	2,765
1854.....	20,588	532	93,060	1,091	2,780

The arrivals of beasts from Norfolk, Suffolk, Essex, and Cambridgeshire have amounted to 10,460 Scots, shorthorns, and crosses; from other parts of England, 3,200 of various breeds; from Scotland, 1,824 Scots and crosses; and from Ireland, 300 oxen, &c.

The general range in prices has been as under—

	s.	d.	s.	d.
Beef	from 3	6 to 5	2	
Mutton	4	0 — 6	0	
Lamb	5	8 — 7	0	
Veal	3	10 — 5	8	
Pork	3	4 — 4	4	

COMPARISON OF PRICES.

	Mar., 1856.		Mar., 1857.		Mar., 1858.	
	s.	d.	s.	d.	s.	d.
Beef .. from	2	10 to 4	10	3	4 to 5	0 .. 2 10 to 4
Mutton ..	3	2 — 5	2 .. 4	2 — 6	0 .. 3	0 — 5 2
Veal	4	10 — 6	0 .. 4	4 — 5	8 .. 4	0 — 5 2
Pork	3	4 — 4	3 .. 3	6 — 5	2 .. 3	0 — 4 4

The aggregate supplies of meat exhibited in Newgate and Leadenhall have been only moderate; and the trade generally may be considered steady, at prices slightly in advance of the previous month.

STALLIONS FOR THE SEASON, 1859.

Name.	Colour.	Age	Pedigree.	Performances.	Principal Performance.	No. of Winners out by	Sire of	Standing at	Apply to	Price.
Aerobol	bay	8	by Ithapel, out of Tour-de-Force, by Sir Hercules	started 19, won 12	Great Yorkshire Stakes	untried.	—	Roydon, Diss	G. Sturgeon	7 gs.
Alarm	bay	17	by Venison, out of Southdown, by Defence	started 17, won 13	Ascot Cup	46	Francis	Newmarket	Messrs. Barrow	12 gs. 6 sovs, h, b, 3 sovs.
Alendale	bay	6	by Touchstone, out of Laffrude, by Langar	started 35, won 6	won the Ham.	untried.	—	Killynny, Ireland	—	7 gs., winners and dams of gratis
Aleppo	bay	6	by Alarm, out of Palmyra, by Sultan	started 23, won 6	won £500 at Ascot	untried.	—	Knockhill, N.B.	R. Menzies	10 gs.
Alonzo	chestnut	13	by Alphaeus, out of Zephira, by Morisco	started 70, won 21	won Doncaster Handicap	untried.	Cyrenus	Delamere, Tamorley	Mr. Hocknell	7 gs., h, b, 3 gs.
Amrose	black	10	by Touchstone, out of Annette, by Priam	started 19, won 3	won second for Derby	3	—	Burghley, Stamford	Mr. H. Rose	20 gs.
Armadale	brown	17	by Touchstone, out of Rebecca, by Lottery	started 15, won 3	ran second for Derby	41	Apaty	Hallentice, Lockergie	Mr. R. Scott	10 gs. (25 mares)
Armadale, an Assayer, The	grey	8	untried from the Dam	started 51, won 17	won Londesborough Cup	untried.	—	Castle Inn, Footing	J. Williams	5 gs.
Audouin	brown	9	by Birdcatcher, out of Pickettost, by Laureol	started 39, won 15	won Cleveland H.	untried.	—	Kesho	Mr. Rathie	5 gs., h, b, 3 gs.
Aurur	chestnut	10	by Sheet Anchor	started 39, won 15	won Cleveland H.	untried.	—	Lisnany, Ireland	—	5 sovs., h, b, 2 sovs.
Autocrat	bay	10	by Birdcatcher, out of Nickname, by Ishmael	started 4, won 3	won Champagne Stakes	5	Soothsayer	Roxwell, Yorks	Mr. F. Martin	10 gs.
Backbite	brown	14	by Bay Middle, out of Empress, by Fenius	started 5, won 3	won the Yew Stakes	untried.	Anic	Lymington	Mr. Makin	8 gs., h, b, &c., 4 gs.
Barnon	bay	15	by Gladiator, out of Don John, out of Scandal, by started 24, won 5	won Goodwood Stakes	1	—	—	Wauford, Knutsford	—	15 gs.
Birdcatcher	black	11	by Selim	started 3, won 6	won the Madrills	180	Faulango	Swalcliffe, Ranbury	Mr. Gulliver	15 gs.
Black Doctor	bay	11	by Voltare, out of Martha Lynn, by Multiato	started 15, won 6	won the Madrills	180	The Baron	Lark Lodge, The Curragh	Mr. C. Pickering	5 gs., h, b, 2 gs.
Bobby	bay	11	by The Doctor, out of Betsy Bird, by Voltare	started 48, won 7	won Manchester Cup	untried.	—	Beverly, &c.	Mr. R. Smith	2½ gs. (35 mares)
Bollingbroke	chestnut	12	at Galloway, by Round Robin, dam by the Arabian	started 15, won 6	won several steep chases	—	—	Emmett's, South Molton	—	5 gs., h, b, 2 gs.
Bonnie Morn	grey	7	by John o' Gaunt, out of Spanae, by Cresus	started 7, won 3	won the Prendergast	1	Freethinker	Windsor, &c.	Mr. Sparrow	7 gs., h, b, 3 gs.
Brocket	bay	9	by Chanticleer, out of Forget-me-not, by Helman Platoff	started 8, won 6	won Champagne Stakes	untried.	—	Woodaton, Nottingham	Mr. Harrison	10 gs., h, b, 5 gs.
Bryan O'Lyinn	chestnut	10	by Melbourn, out of Mrs. Slick, by M. Moloch	started 7, won 3	won Royal Hunt Cup	4	Queen of the Wye	Denham, Usbridge	Mr. Wheeler	5 gs., h, b, 2½ gs.
Backhunter	chestnut	4	by Birdcatcher, out of Cleopatra, by Roller	started 8, won 2	won Curragh Scoury	6	Sans Culotte	Rathbride, Curragh	Mr. Peat	5 gs., h, b, 3 gs.
Cannobie	bay	6	by The Falow Buck, out of Charming Kate, by Sir Hercules	started 6, won 1	won N. Devon Handicap	untried.	—	Church-end, Wiltshire	—	10 gs., h, b, 5 gs.
Chanite	chestnut	8	by Melbourn, out of Lady Lurewell, by Hornsea	started 8, won 2	won Yelport Handicap	untried.	—	Cawston, Rugby	W. Hemming	5 sovs, h, b, 2 sovs.
Chanicleer	grey	16	by The Emperor, dam by Economist	started 5, won 3	taken 8 prizes	47	—	Scarborough, &c.	Mr. H. Chambers	25 gs. (40 mares)
Charleston	bay	6	by Birdcatcher, out of Whim, by Drone	started 37, won 21	won Doncaster Cup	untried.	Sunbeam	Croft, Darlington	T. Winterringham	20 gs., h, b, 5 gs.
Chevalier d'Industrie	chestnut	5	by Sovereign, out of Mitwood, by Monarch	started 14, won 3	won the Gravatwice	untried.	—	Leabourne, Walsstone	Mr. Tweed	20 gs., h, b, 5 gs.
Chicken, The	bay	7	by Orlando, out of Industry, by Priam	started 14, won 3	won the Gravatwice	untried.	—	Theobald's Farm, Enfield	Mr. Gray	2 sovs., h, b, £2 10s.
Charet	brown	7	by Magpie, out of Cireo, by Skylark	started 56, won 18	won the Curragh Whip	untried.	—	Rathbrin, Tullamore	Mr. J. Webster	5 gs., h, b, 2 gs.
Colonist	bay	5	by Touchstone, out of Mountain Sylph, by Belshazzar	started 27, won 6	won G. Duke Michael	untried.	—	Alborton, Marishes, York	—	7 gs.
Coisterdale	brown	11	by Melbourn, out of Forget-me-not, by Helman Platoff	started 2, won 7	won Liverpool Cup	1	Shafto	Brownstown, The Curragh	Mr. Clancey	10 gs.
Confessor	bay	11	by Lanercost, dam by Tomboy	started 6, won 2	won Great Yorkshire Handicap	2	Blacksmith	Owaby, Brig	Mr. Ashton	6 gs., h, b, 3 gs.
Coningsby	bay	15	by Cowi, out of Fret Fly, by Mosquito	started 6, won 3	won the Criterion	untried.	—	Phyne, Carrick-on-Suir	—	5 gs., h, b, 2 gs.
Corchus	bay	7	by Venison, out of Ruby, by Rabens	started 17, won 4	won Beninck M. S.	66	—	The Curragh	Mr. L. Keegan	10 gs., h, b, 3 gs.
Cotherstone	bay	19	by Slane, out of Gala, by Galao	started 17, won 4	won Beninck M. S.	66	—	Hallford, Smlbury	Mr. Carter	10 gs. (20 mares)
Cowl	bay	17	by Touchstone, out of Emma, by Whisker	started 11, won 7	won the Derby	29	Glance	Alborton, Northampton	T. Wilson	10 gs., h, b, 3 gs.
			by Bay Middleton, out of Crucifix, by Priam	started 8, won 5	won Backenham Stake	29	Dervish	Newmarket	Messrs. Barrow	10 gs., h, b, 3 gs.

Crusader	brown ..	9	by Crozier, out of Summer Hill, by Whalebone started 8, won 3 royal plates	untried.	—	Summer Hill, Meath, Ireland	—	4 gs., h. b. 2 gs.
Cure, The	brown ..	18	by Physician, out of Morsel, by Mulatto	27	M. D.	Bushy, Hampton Court Mill End, Henley-on-Thames	H. Harvey	2 gs., h. b. 2 gs.
Dagobert	bay	9	by Ion, dam by Laugar	untried.	—	—	—	7 gs., h. b. 2 gs.
Daniel O'Rourke	chestnut	10	by Birdcatcher, out of Forget-me-not, by Het started 12, won 2 won the Derby	4	Gaspard	Stadmere, Malton	—	10 gs., h. b. 5 gs.
Dear-me!	bay	9	by Melbourne, out of Ennui, by Bay Middleton started 45, won 7 won £130 at Goodwood	untried.	—	Harwood, Bolton-le-Moors	Mr. Reathead	5 gs., h. b. 2½ gs.
De Clare	bay	7	by Touchstone, out of Miss Bova, by Catton	untried.	—	Cross Keys, York	Mr. Pearson	7 gs., h. b. 2½ gs.
Defiance	bay	11	by Old England, out of Vexation, by 1 outchbone started 54, won 173 won Northampton Stakes	4	—	Woolaton, Nottingham	Mr. Harrison	5 gs., h. b. £2 10s.
De Ruyter	bay	9	by Lanercost, out of Barbelte, by Sandbeck	untried.	—	Castle Acre, East Angles	H. Heppenstall ..	5 gs., h. b. 2 gs.
Dr. O'Toole	chestnut	8	by Birdcatcher, out of Dahlia, by New Fashion started 22, won 7 won £160 at Curragh ..	untried.	—	French Furze, Curragh Rawcliffe, York	—	5 sovs., h. b. 2 sovs.
Dr. Sangrado	chestnut	18	by Physician, out of Sweetbriar, by Langar	never appeared ..	—	Rawcliffe, York	Mr. Manning	7 gs., h. b. 2 gs.
Drayton	brown ..	2	by Mulcey, out of Prima Donna, by Southsayer never appeared ..	10	Bourton	Ovingbury, Wellingbro'	—	10 gs., h. b. 3 gs.
Drumour	chestnut	5	by Big Jerry or Weatherbit, out of Elspeth, by I. Birdcatcher ..	untried.	—	Boyhorpe, Chesterfield	H. Bird	10 gs., h. b. 5 gs.
EI Hakim	bay	5	by The Cure, out of Martin Cat, by M. Moloch started 13, won 3 won Ebor Hand'cap	untried.	—	Richmond, York	T. Lunn	5 gs., winners gratis
Ellington	brown ..	6	by the Flying Dutchman, out of Elterdale, by started 10, won 3 won the Derby	untried.	—	Wilkesden	Mr. Tilburn	10 gs.
Escape	bay	7	by Beverick, out of Slender, by Longwaist	untried.	—	Kineston, Lewes	T. Mann	5 gs., d. of winn'grat.
Ethelbert	chestnut	9	by Fauch a Ballagh, out of Espoir, by Liverpool started 13, won 3 won City & Suburban H. ..	untried.	—	Swalcliffe, York	Mr. Gulliver	20 gs., h. b. 5 gs.
Fallow Buck	bay	14	by Venison, out of Penary, by Emilius	never appeared ..	—	Rawcliffe, York	Mr. F. Martin	10 gs., (40 mares)
Fandango	bay	7	by Barnton, out of Casanette, by Don John	10	Electric	Neasham, Darlington	Mr. Cookson	12 gs., (40 mares)
Fazzoletto	bay	6	by Orlando, out of Canezu, by Melbourne	untried.	—	Lane Padlo, Ks. Sheffield	Mr. F. Croft	15 gs., (30 mares)
Filbert	brown ..	9	by Nutwith, out of Cecilia, by Touchstone	1	The Speaker	Halling, Strood, Kent	Mr. J. Parr	5 gs.
Filho	black ..	12	by Giovanni, out of Rosalie, by Maple	untried.	—	Newmarket	Messrs. Barrow ..	7 gs., h. b. 3½ gs.
Flateacher	bay	14	by Touchstone, out of Decoy, by Filho-da-Puta started 26, won 17 won 2,000 Gs. Stakes ..	45	Courtenay	Hambleton, Thirsk	Mr. W. Stebbing	5 sovs., h. b. 2 sovs.
Flying Buck	bay	9	by Venison, out of Vania, by Lottery	untried.	—	Shooforth, Wetherby	Mr. Groves	5 gs., h. b. 2½ gs.
Footool	bay	16	by The Saddler, out of Tredge, by Tramp	8	Oleaster	Hasketon, Fitchet	D. Richer	5 gs., h. b. 2½ gs.
Forssal	brown ..	9	by Sheik Anchor, out of Valencia, by Cervantes never appeared ..	untried.	—	Southlea, Fitchet	H. Howse	5 gs., h. b. 2 gs.
Frederick	chestnut	7	by Arby, out of Australia, by Langar	untried.	—	Shooforth, Wetherby	Mr. Groves	7 gs.
Fredrick	bay	10	by The Sea, out of Miss Cobden, by Stockport a ..	untried.	—	Cheltenham	Mr. Holman	9 gs.
Frogmore	bay	4	by Touchstone, out of Duchess of Kent, by Bel-never appeared ..	untried.	—	Brighton and Sussex	Mr. Megennis ..	£7 10s., h. b. £2 10s.
Gameboy	brown ..	17	by Tomboy, out of Lady Moore Carey, by Tramp never appeared ..	33	Trousscau	Turf Tavern, Doncaster	Mr. W. King	10 gs., h. b. 2 gs.
Gau-keeper	brown ..	8	by Birdcatcher, out of Swallow, by Lanercost started 54, won 10 won July Stakes	5	Abm	Maryborough, Ireland	—	£5, h. b. £2 10s.
Grecian	chestnut	11	by Epirus, out of Jenny Jumps, by Rococo	untried.	—	Theobald's, Stockwell	—	8 gs.
Harbinger	brown ..	10	by Touchstone, out of Cuckoo, by Ellis	untried.	—	Bellestown, Ireland	—	5 gs.
Harceus	chestnut	8	by Harkaway, out of Lady Lift, by Sir Hercules started 19, won 3 won Newmarket H.	untried.	—	Swalcliffe, Ranbury	Mr. Gulliver	£3 10s.
Hermat, The	brown ..	8	by Bay Middleton, out of Jenny Lind, by started 10, won 5 won 2,000 Gs. Stakes ..	untried.	—	Newmarket	Messrs. Barrow ..	10 sovs.
His Grace	bay	10	by Oakley, out of Alice, by Camel	untried.	—	Sandle Bridge, Knutsford	Mr. Bowden	3 gs.
Hobbe Noble	bay	10	by Pant loon, out of Phryne, by Touchstone	1	Mcryman	Cawston, Rugby	W. Henning	20 gs., (45 mares)
Honilly, Bro'	chestnut	5	by Supplies, out of Blue Devils, by Velocipedes started 6, won 3 won the Anglesey	untried.	—	Lyde, Hereford	—	5 gs., h. b. 2 gs.
Horn of Chase	chestnut	15	by Harkaway, out of Victoria, by Philip the Par- started 4, won 3 won the Anglesey	untried.	—	Tynago, Galway	—	5 sovs., h. b. £2 10s.
Hospitality	brown ..	6	by Malcoln, out of Eavy, by Perion	untried.	—	Lexburn, Sc.	Mr. Ridley	5 gs., h. b. 2 gs.
Hosparac	chestnut	8	by Helman Platoff, out of Infid Iny, by Voltare started 35, won 14 won £340 at York	untried.	—	Gillingwood, Richmond	Mr. Simp on	6 gs., h. b. 2 gs.
Harworth	chestnut	9	by Birdcatcher, out of Wasp, by M. Moloch	untried.	—	Keyworth, Derby	Mr. Deham	5 gs., h. b. 2½ gs.
Hymetus	brown ..	10	by Bay Middleton, out of Tre-wax, by Liverpool never appeared ..	2	Wheatland	Ollington, Bridgnorth	Mr. A. Worrall ..	5 gs.
Idas	bay	17	by Liverpool, out of Marpessa, by Muley	4	Evington Lass ..	Measham, Athertonstone	R. Noon	7 gs., h. b. 3 gs.

STALLIONS FOR THE SEASON 1859—(Continued).

Name.	Colour.	Age.	Pedigree.	Performances.	Principal Performance.	No. of winners out by.	Sire of	Standing at	Apply to	Price.
Idle Bay	chestnut	14	by Harkaway, out of Idle, by Sir Hercules...	started 9	—	6	Pretty Boy	Rawcliffe, York	Mr. F. Martin ..	15 gs. (40 mares)
Joe of Sot	chestnut	15	by Belmont Platford, out of Welfare, by Priam...	started 57, won 8	—	2	Borderer	Beverley	Mr. G. Robinson ..	10 gs.
Joe Lovell	bay	18	by Velociped, out of Cyprion, by Partizan ..	started 6, won 3	won Great York Stakes ..	12	Noisy	Alvediston, Wilts	—	10 gs., h. b. 5 gs.
John G. Gaunt	chestnut	21	by Taraxus, out of Atona, by Partizan	started 38, won 23	won Newmarket S. ..	23	Hungerford	Hambleton, Thirsk ..	Mr. W. Siebbing ..	5 sovs., h. b. 2 sovs.
Johnstown	bay	11	by Tearaway, out of Walf of Ardagh, by Napoleon ..	started 3	—	untried.	—	Moynath, Trim, Ireland ..	—	4 sovs., h. b. 2 sovs.
King Caradoc	black	11	by Prince Caradoc, out of Miss Julia Bennett ..	started 14, won 2	won £144 at Malton ..	untried.	—	Scarbro'	Mr. Stephenson ..	gratis, h. b. 2 gs.
King-maker	—	5	by the Baron, out of Victess (bred in France ..	started 18, won 15	won £50 at Newmarket ..	untried.	—	Drincholl's, Fenfold	Mr. A. Gray	5 gs., h. b. 3 sovs.
King of Frippes	chestnut	10	by Velociped, out of Mrs. Gill, by Victor ..	started 47, won 2	won the Port	untried.	—	Threobald's, York	Mr. Horsley	5 gs., h. b. 3 sovs.
King Tom	bay	10	by Venison, out of Queen Anne, by Shane ..	started 43, won 17	won Goodwood Cup ..	6	Gladiolus	Middle Park, Etlham ..	Mr. Benkiron	25 gs. (35 mares)
Knight of Avenel	chestnut	12	by Harkaway, out of Po-slonias, by Glencoe ..	started 6, won 3	ran second for Derby ..	untried.	—	Memmore, Bucks	Mr. Markham	25 gs. (30 mares)
Knight of Gwynne	chestnut	12	by the Doctor, out of Elbe Bonnet, by Touch ..	started 6, won 4	won the Port	2	Sir Walter Scott	Argylethorpe', Middleham ..	Mr. T. Dawson	10 gs., h. b. 2 gs.
Knight of St. George	bay	8	by Gilbert Gurney, out of Seawood, by Shane ..	started 13, won 5	won Newton St. Leger ..	5	Slattern	Water Tower, Rugby	Mr. Walker	5 gs., h. b. 2½ gs.
Knight of the Green	chestnut	15	by Bir catcher dam, by Hermon Platoff	started 17, won 5	won the St. Leger	untried.	—	Rawcliffe, York	Mr. F. Martin ..	10 gs.
Labrador	chestnut	10	by The Label, out of Miss Kitty Cockle, by ..	started 17, won 4	won Cleshire Stakes ..	untried.	—	Sawston, Cambridge	Mr. Towgood	10 sovs., h. b. 5 sovs.
Lambton	bay	9	by the Curé, out of Elphive, by Enfilus	started 25, won 10	won York County Plate ..	untried.	—	Bushbury, Wolter- hampton	Mr. Daly	6 gs., h. b. 3 gs.
Lambour	chestnut	5	or Loup-Grou, dam by Pantaloon	started 17, won 5	won the Molecomb	untried.	—	Ovmsby, Brig	Mr. J. Ashton ..	6 gs.
Lancelle	bay	9	by Touchstone, out of Cora, by Beislaazar ..	started 17, won 5	won the Molecomb	untried.	—	Wanford, Knutsford ..	Mr. Makin	8 gs., h. b. &c., 4 gs.
L'opold	chestnut	10	by Philogen, out of Marinella, by Southsayer ..	started 7, won 2	won Ascot Vase	1	Bastion	Willoughby, water ..	Mr. Hopkins	5 gs., h. b. 2 gs.
Li-el, The	brown	17	by Pantaloon, out of Pasquinade, by Camel ..	started 7, won 3	won Chester St. Leger ..	14	Truth	Leighton Buzzard ..	Mr. Markham ..	7 gs., h. b. 3 gs.
Little Harry	bay	11	by St. Luke, out of Sribah, by Number Nip ..	started 3, won 1	won the Kirwans	untried.	—	Stedmere, Malton	Mr. Watts	10 gs., h. b. 3 gs.
Longear	bay	9	by Hunslet, out of Miss Bows, by Cotton	started 21, won 13	won Stewards' Cup	4	Toxophilite	Auger-street, Dublin ..	Mr. Forshaw	5 sovs., h. b. £2 10s.
Lord Falconberg	bay	12	by Bidderer, out of Alice Hawthorne, by ..	started 19, won 1	won a Royal Plate	untried.	—	Knawley, Prescott	T. Forshaw	15 gs.
Lord of the Hills	brown	5	by Touchstone, out of Fair Helen, by Pantaloon ..	started 4, won 1	won £903 at Goodwood ..	untried.	—	Edinburgh	Mr. McAdam	6 gs.
Lord of the Isles	bay	7	by Touchstone, out of Fair Helen, by Pantaloon ..	started 10, won 4	won 2,000 gs. Stakes ..	untried.	—	Angel, Catterick	Mr. Bennison ..	6 gs., h. b. 2 gs.
Louisa	black	13	by Lanercost, out of Moobean, by Tomboy ..	started 6, won 2	received £15 th	6	Lambourne	Croft Darlington	T. Winteringham ..	2 gs.
M. D.	brown	5	by Surplice, out of Landis, by Langar	started 10, won 2	won the Clearwell	untried.	—	Redlands Reading	Mr. Ledard	20 gs.
Magister	chestnut	8	by the Curé, out of Theano, by Walsley	started 11, won 3	won the Nursery	untried.	—	Alasworth, Northleach ..	Mr. Haines	5 gs.
Maidenhead	chestnut	5	by Magnet, out of Lady Paramount, by The Earl ..	started 4, won 1	won £90 at Manchester ..	untried.	—	Mountstown, Meath	—	5 sovs., h. b. 3 sovs.
Marouder	chestnut	4	by Orlando, out of Dovesway, by Enfilus	started 8, won 2	won £75 at Kelso	untried.	—	Buckham, Uckfield	Mr. T. Brown	5 gs., h. b. £2 10s.
Mary Hill	chestnut	8	by Cosack, out of Barbara, by Plenipotentiary ..	started 6, won 2	won £100 at Newmarket ..	untried.	—	Stodrig, Kelso	—	5 gs., h. b. 2 gs.
Marys	chestnut	8	by Melbourne, out of Moverina, by Touchstone ..	started 4, won 1	won £220 at Newcastle ..	untried.	—	21, Bridge-street, South- wark	Mr. Hornly	5 gs., dams of winners gratis
Middlesex	chestnut	11	by Beiran, out of Mooliban, by Whisker	started 25, won 2	won July Stakes	untried.	—	Sterne, Driffield	Mr. Stockdale ..	5 gs., h. b. 2 gs.
Mildew	chestnut	12	by Melbourne, out of Evening Star, by Touchstone ..	started 21, won 10	won Newmarket St. Leger ..	2	Pan	Middle Park, Etlham ..	Mr. Benkiron	8 gs., h. b. 4 gs.
Minerva	chestnut	12	by St. Luke, out of Rembrandt, by Voltaire ..	started 21, won 10	ran and for 2,000 gs. ..	untried.	—	Burthley, Stamford	Mr. H. Rose	10 gs.
Miss Hamit	bay	13	an Arabian	started 21, won 10	won Ascot Vase	5	Plague Royal	Huffley, Ipswich	D. Richer	5 gs., h. b. 2½ gs.
Mr. Milner	brown	13	by Bay Middleton, out of Miss Milner, by Malek ..	started 2, won 1	won Molecomb S.	untried.	—	Rawcliffe, York	Mr. F. Martin ..	7 gs.
Mr. Milner	brown	13	by Bay Middleton, out of Miss Milner, by Malek ..	started 2, won 1	won Molecomb S.	untried.	—	Halleath, Lockerbie	Mr. R. Scott	2 gs.
Mr. Milner	brown	13	by Bay Middleton, out of Miss Milner, by Malek ..	started 2, won 1	won Molecomb S.	untried.	—	Newmarket	Messrs. Barrow ..	9 gs. (3 mares)
Mr. Milner	brown	13	by Bay Middleton, out of Miss Milner, by Malek ..	started 2, won 1	won Molecomb S.	untried.	—	Newmarket	—	7 gs., h. b. 3 gs.

Moorcock	brown	17	by Heron, dam by Young Phantom	started 8, won 4	won a Plate	untried.	6	Drogheda	Whitehall, under-Edge Dean's Hill, Stafford	S. Cole	7 gs, h, b, 3 gs.
Mountain Deer	bay	11	by Touchstone, out of Mountain Sybil, by Bel-shazzar	started 20, won 6	won the Criterion	untried.	6	Mr. Painter	Mr. Painter	Mr. Painter	15 gs. (40 mares)
Muscovite	bay	10	by Hetman Platoff, dam by Canel	started 10, won 2	won Cesarswitch	untried.		R. Harris	Euxton, Lancaster	R. Harris	10 gs, h, b, 3 gs.
Neasham	bay	11	by Napoleon, out of Sally Snobs, by Sandbeck	started 16, won 7	won Gt. Northern Hand	untried.		Mr. Blenkiron	Middle Park, York	Mr. Blenkiron	8 gs, h, b, 4 gs.
Newcourt	bay	16	by Sir Hercules, out of Sybil, by Spectre	started 10, won 8	won Hereford Stakes	untried.		T. Lunn	Richmond, Wiltshire	T. Lunn	8 gs, h, b, 3 gs.
Newminster	bay	11	by Touchstone, out of Beewing, by Dr. Syntax	started 10, won 2	won St. Leger	9	Cotswood	Lyde, Hereford	Mr. F. Martin	Mr. F. Martin	5 gs, h, b, 2 gs.
Newon-le-Wil-lows	brown	5	by Melbourne, out of Lapwing, by Bustard	started 19, won 8	won Kirwan Handicap	untried.		Mr. F. Martin	Ravcliffe, York	Mr. F. Martin	subs. (fall)
Nutcracker	brown	19	by Nutwith, out of Amina, by Sultan	started 19, won 6	won Drawing Room S.	untried.		Mr. Salmon	Limerick	Mr. Salmon	8 sovs, 2 sovs.
Nutwith	bay	19	by Tomboy, dam by Conus	started 7, won 3	won St. Leger	29	Cobnut	Stratford, London	Mr. H. Rose	Mr. H. Rose	5 gs, h, b, 3 gs.
Oneer Pasha	bay	7	by an Arab-pan-a-pure Seglavée Djedraene, never appeared	never appeared		untried.		Mr. Wilson	Burghley, Stamford	Mr. Wilson	20 gs.
Oulton	bay	7	by Melbourne, out of Alice Hawthorn, by Muley Moloch	started 11, won 7	won Queen's Vase	untried.		Mr. Hemming	Althorp, Northampton	Mr. Hemming	2 gs.
Paleroi	brown	7	by Touchstone, out of Capezon, by Melbourne	started 13, won 4	won £1800 at Newmarket	untried.		T. Forshaw	Knowsley, Prescott	T. Forshaw	7 gs, h, b, 2½ gs.
Papagano	chestnut	8	by Birdcatcher, out of Sisterio Wanota, by Simoom	started 2		untried.		J. Massie	Easby, Richmond	J. Massie	5 gs, h, b, 2 gs.
Pellon	chestnut	19	by Ion, out of Ma Mie, by Jerry	started 16, won 8	won Edinon Stakes	2	Castanette	Darebury	Mr. H. Rose	Mr. H. Rose	10 gs.
Plempy	bay	19	by Belmar, out of Lucet, by Beveler	started 6, won 2	won Gt. Duke Michael S.	17	Leopold	Burghley, Stamford	Mr. P. Snaith	Mr. P. Snaith	9 gs.
Pompey	bay	15	by Emilius, out of Variation, by Bustard	started 25, won 10	won Great York Hand. (2)	12	Nancy	Boston	Mr. P. Snaith	Mr. P. Snaith	9 gs.
Pottinger	bay	16	by Plenipotentiary, out of Enterprise, by Defence	started 22, won 2	won £80 at Newmarket	12	Lady Vernon	Howden, &c.	Mr. Sanderson	Mr. Sanderson	6 gs, h, b, 2 gs.
Poynton	bay	13	by Touchstone, out of Lady Stafford, by Conus	started 31, won 8	won Great York S.	11	Lustre	Crown & Thist'g, March	Mr. Hardbron	Mr. Hardbron	6 gs, h, b, 3 gs.
Prime Minister	brown	11	by Melbourne, out of Pantalona, by Pantaloon	started 31, won 8	won the Port	1	Penang	Crown & Thist'g, March	Mr. Mather	Mr. Mather	5 gs, h, b, 2½ gs.
Prizefighter	chestnut	16	by Tearaway, out of Decenton, by Eagle	never appeared		untried.		W. Hornshaw	Stand-house, St. Albans	W. Hornshaw	2 sovs.
Ratan	chestnut	8	by Slime, out of Prescave, by Emilius	started 27, won 4	won Goodwood Stakes	14	A Pony	Bushy, Hampton Court	Mr. Ayling	Mr. Ayling	5 gs, h, b, 3 gs.
Ratan	chestnut	18	by Bazzard, dam by Picon	started 7, won 3	won the Criterion	14	Remunerator	Alvediston, Wilts	Mr. Walker	Mr. Walker	5 gs, h, b, 2½ gs.
Rataplan	chestnut	9	by The Baron, out of Pochahontas, by Gleneoe	started 71, won 42	won 21 Royal Plates	untried.		Mr. Peat	Tekhill Castle Farm	Mr. Peat	5 gs, h, b, 3 gs.
Rattle	chestnut	9	by The Fallow Buck, out of The Hamble, by Camel	started 7		untried.		Mr. Ayling	Audler's Ash, Liss.	Mr. Ayling	8 gs.
Recovery Junior	chestnut	16	by Recovery, dam by Hampton	has carried a horse		untried.		D. Rieher	Hasketon, Ipswich	D. Rieher	2 gs.
Retriever	chestnut	23	by Recover, out of Taglion, by Whisker	started 53, won 24	won Goodwood Stakes	11	High Wycombe	Water Tower, Rugby	Mr. Walker	Mr. Walker	5 gs, h, b, 2½ gs.
Reynaldo	bay	3	by Kingston, out of Kirtle, by Sultan	started 3		untried.		Mr. Peat	Churchend, Wiltshire	Mr. Peat	5 gs, h, b, 3 gs.
Rifleman	bay	7	by Touchstone out of Camp Follower, by The C-lonel	started 16, won 8	won Great York S.	untried.		Mr. Ward	Sleluene, Malton	Mr. Ward	15 gs.
Rochester	black	13	by Chatham, out of Margravine, by Little John	started 17, won 5	won £275 at Newmarket	5	Killigrew	Fountain, Bedford	Mr. Ward	Mr. Ward	6 gs, h, b, 2½ gs.
Roland	bay	13	by The Saddler, out of Executrix, by Liverpool	started 15, won 2	won Wolverhampton S.	1	A Pony	Spotforth, Wetherby	Mr. Groves	Mr. Groves	5 gs, h, b, 2½ gs.
Ruby	bay	8	by Bay Middleton, out of Crown Jewell, by Ducier	started 9, won 1	won Althorp Park S.	1	High Wycombe	Spotforth, Wetherby	Mr. T. Robinson	Mr. T. Robinson	5 gs, h, b, 2½ gs.
Rushbrough	chestnut	12	by Tearaway, out of Cruiskeen, by Sir Hercules	started 25, won 4	ran a dead heat for St. Leg.	untried.		Mr. T. Dawson	Agrethorpe, Middleham	Mr. T. Dawson	10 gs, h, b, 5 gs.
Saraband	bay	7	by Cothersone, out of Sequitilla, by Sheet Anchor	started 47, won 8	won Doncaster 2 y.-old S	untried.		Mr. Harvey	Macclesfield	Mr. Harvey	5 gs, h, b, 2½ gs.
St. George	bay	18	by Ismael, out of Whinn, by Drone	ran well in Ireland	won the Chester Cup	13	Knight of Avon	Holcombe, Somerset	Mr. Lansworthy	Mr. Lansworthy	£2 10s.
St. Lawrence	brown	22	by Skylark or Lapwing, out of Helen, by Blacklock	started 58, won 23		1	Saucebox	Market Harborough	Mr. Burdett	Mr. Burdett	7 gs, h, b, 3 gs.
St. Martin	brown	24	by Acteon, out of Galena, by Walton	started 18, won 9	won Dunfrices Cup	22	Eryx	Bromyard	Mr. Grimshaw	Mr. Grimshaw	2 gs.
St. Michael	bay	10	by Delirium, out of Hope, by Muley Moloch	started 11, won 2	won Sefton Handicap	untried.		Mr. Hussey	Charney, Wantage	Mr. Hussey	5 gs, h, b, 2½ gs.
Sir John Barley-corn	brown	10	by Ismael, out of the Baron, out of Lovesilly, by Canel	started 4		untried.		Mr. Holman	Skirme, Henley-on-Thames	Mr. Holman	24 gs.
Sir Peter Laurie	bay	15	by The Saddler, out of Well-a-day, by Priam	winner of many steeple-chases		untried.		Mr. Eyke	Cheltenham	Mr. Holman	5 gs. (45 mares)
Sir Tatton Sykes	bay	19	by Sheet Anchor, dam by Margrave	started 15, won 4	won St. Leger	15	Fobolski	Stanton, Shiffnal	Mr. Barracl.	Mr. Barracl.	7 gs.
Strakol	brown	16	by Don John, out of Miss Lydia, by Walton	started 3, won 1	won £70 at Newton	2	Donna	Barney, Norfolk	Mr. Barracl.	Mr. Barracl.	4 sovs, h, b, 2 sovs.
Spanish Jack	brown	16	by Don John, out of Miss Lydia, by Walton	started 3, won 1	won £70 at Newton	2		Clay Hill, Kent	Mr. Schillo	Mr. Schillo	6 gs, h, b, 3 gs.

STALLIONS FOR THE SEASON, 1859—(Continued).

Name.	Colour.	Age.	Pedigree.	Performances.	Principal Performance.	No. of Winners out by.	Sire of	Standing at	Apply to	Price.
Spanner	bay	5	by Colchester, out of Polka, by Emilius, by Sironium, out of Thorn, by Barkway	started 5, won 10	took prize at Chester won 5 Royal Plates	untried.	—	Thirkley, Thirsk	Mr. Mansfield	5 ggs, h. b. 2 gs.
Sprig of Shille- lago	bay	7	by Colchester, out of Florence, by Velociques	started 10, won 12	won £135 at Chester won St. Leger	untried.	Mrs. Stowe	Beverley	Mr. Mansfield	7 ggs, h. b. 3 gs.
Stiedo	black	8	by The Baron, out of Pocahontas, by Glencoe	started 21, won 12	won St. Leger	1	Ferrona filly	Agzlethorp, Middleham	Mr. T. Dawson	5 ggs, h. b. 2 1/2 gs.
Stonwell	chestnut	10	by Touchstone, out of Gluznee, by Pantalon	started 2, won 1	won £160 at Doncaster	2	Stormsail	Kirby, Tadcaster	Mr. Scott	30 ggs. (30 mares)
Stonwell	bay	7	by Crescent, out of Madame Vestris, by Distingue	started 2, won 6	won Cambridgehire	untried.	—	Redwads, Reading	Mr. Ledard	10 ggs.
Sultan	chestnut	6	by Tear-out, out of Madame Vestris, by Distingue	started 19, won 4	won £15 at the Curragh	33	Roman Candle	Theobald's, Enfield	Mr. Gray	9 sovs, h. b. £1 10s.
Sunshaw	chestnut	17	by Touchstone, out of Crucifix, by Priam	started 16, won 9	won the Derby	untried.	—	Askerton, Enfield	Messrs. Weatherly	13 ggs. (40 mares)
Sunshaw	brown	17	by Gladiator, out of Lollypop, by Starck	started 24, won 23	won Queen's Vase	31	Muncemal	Dunbury, Shifnal	Mr. Eyle	10 ggs. (30 mares)
Swindon	brown	13	by Ion, out of Palmyra, by Sultan	started 11, won 8	won Graticwey Stakes	12	Leones	Royston, Diss	Mr. Sturgeon	10 ggs. (30 mares)
Tadnor	brown	13	by Ion, out of Palmyra, by Sultan	started 11, won 8	won Graticwey Stakes	12	Mayonaise	Theobald's, Enfield	Mr. A. Gray	25 sovs. (full)
Teddington	chestnut	11	by Orland, out of Miss Twickenham, by St. Giles	started 15, won 10	won the Derby	9	Alcoran	Theobald's, Enfield	Mr. Crawford	5 ggs, h. b. 2 1/2 gs.
Tempest	brown	6	by Melbourne, out of Mearne, by Touchstone	never appeared	—	untried.	—	Newton Purcell, Oxon.	Mr. P. Smith	30 ggs.
Theon	brown	17	by Emilius, out of Maria, by Whisker	started 6, won 5	won Duke Michael S.	17	—	Boston	Mr. Gray	10 ggs.
Teazer, The	bay	8	by Ion, out of Prairie Bird, by Gladiator	started 6, won 2	won a Cup at Chelmsford	untried.	—	Theobald's, Enfield	Mr. Gray	10 ggs.
Teazer, The	bay	6	by Melbourne, out of Agnes, by Pantalon	started 13, won 3	won a Cup at Chelmsford	untried.	—	Ardee, Louth, Ireland	C. Campbell	4 ggs, h. b. 2 sovs.
Terns	Bay	13	by Taurus, out of Clarissa, by Deuce	started 5, won 10	won Chesterfield Cup	10	Hanlet	Warfield, Berks	J. Pryke	8 ggs.
Ugly Buck, The	bay	18	by Venison, out of Monstrosity, by Pleistopentary	started 5, won 3	won 2,000 ggs. Stakes	20	Annonia	Berry Hill, Stoke-on-Trent	Mr. Parby	5 ggs, h. b. 2 1/2 gs.
Uncle Tom	black	7	by Coningham, dam by Bran	never appeared	—	untried.	—	Ardman, Cather	—	5 sovs, h. b. 2 sovs.
Vanderbeck	brown	9	by Bay Middleton, out of Barbelle, by Sandbeck	started 18, won 4	won Cheshire Stakes	untried.	—	Theobald's, Enfield	Mr. Gray	10 ggs.
Vanderburgh	brown	6	by Van Tromp, out of Miss Julia Bennett, by Mulatich	started 20, won 3	won Warwickshire H.	untried.	—	Willesden	Mr. Tilbourn	10 ggs, h. b. 5 gs.
Vandyke	bay	4	by The Flying Dutchman, out of Emante, by Lawcest	started 3, won 1	won Motisfont S.	untried.	—	Mamhead, Exeter	—	5 ggs, h. b. 3 gs.
Vaticum	bay	13	by Venison, out of Vat, by Lauger	started 27, won 11	won Newmarket S.	7	Valiant	Hambleton, Thirsk	Mr. Stebbing	5 sovs, h. b. 2 sovs.
Vedette	brown	5	by Volucien, dam by Birdcatcher	started 16, won 8	won 2,000 ggs. Stakes	untried.	—	Royston, Diss	G. Sturgeon	20 ggs. (35 mares)
Vengeance	bay	7	by Chanticleer, dam by The S. deller	started 21, won 7	won Cesarewitch	untried.	—	Hursbourne, Hants	Mr. Milton	10 ggs, h. b. 3 gs.
Vindes	bay	9	by Touchstone, out of Garland, by Langar	started 40, won 13	won Champagne S.	untried.	—	Newmarket	Mr. Buder	10 sovs.
Vobisgar	brown	12	by Voltair, out of Martha Lynn, by Mulatio	started 11, won 5	won the Derby	12	Vedette	Middlethorpe, York	Mr. Smallwood	40 ggs. (full)
Vobisgar	bay	7	by Huncid, out of Abaft, by Sheet Anch'r	started 1, won 1	won the Derby	untried.	—	Ashton, Lancaster	W. Robinson	3 gs.
Wardlow	roan	6	by Birdcatcher, out of Elphine, by Emilius	started 19, won 6	won St. Leger	untried.	—	Kirby, Tadcaster	Mr. Scott	10 ggs.
Wardlow	brown	17	by Sheet Anchor, out of Miss Letty, by Priam	started 8, won 3	won Four-year-old S.	31	Beadsman	Eashy, Richmond	Mr. Massey	25 ggs. (40 mares)
West Australian	bay	7	by Melbourne, out of Mowbray, by Touchstone	started 11, won 10	won the Derby	untried.	—	Kirby, Tadcaster	Mr. Scott	10 ggs. (30 mares)
Wild Dayrel	brown	7	by Ion, out of Ellen Middleton, by Bay Mid	started 4, won 3	won the Derby	untried.	—	Chilton, Hungerford	Mr. Rickaby	30 ggs. (40 mares)
Wild Huntsman	bay	8	by Harkway, out of Honey Dear, by Penipo	started 26, won 11	won Great Yorkshire S.	untried.	—	Edinburgh	Mr. McAdam	6 gs.
Windholm	brown	12	by Pantalon, out of Phryne, by Touchstone	started 6, won 1	won £74 at Reading	10	Arminius	Rassley, Hungerford	Mr. Dawson	15 gs.
Whidshelgratz	bay	11	by Jeremy Diddler, out of Medea, by Whisker	started 13, won 2	won Goodwood Stakes	2	Intiskillen	Castle Archdall, Ennis-killen	H. Heppenshall	5 ggs, h. b. 2 gs.
Wood-Pigeon	bay	17	by Velociques, out of Amiana, by Sultan	started 43, won 18	won Ascot Stakes	4	Turbit	Burghey, Stamford	Mr. H. Rose	15 gs.
Woodford	chestnut	12	by Chaldon, out of Clementina, by Acteon	started 47, won 10	won Ascot Cup	10	Greenwich Fair	Bodicot paddocks	W. Hase	12 gs.
Yellow Jack	chestnut	6	by Birdcatcher, out of Januata, by Liverpool	started 7, won 1	ran second 6 times	untried.	—	Newmarket	Messrs. Barrow	11 gs.

The Groom's Fee, if not included, varies from a Guinea to Half-a-Crown. We are not answerable for all the Performances of, or Stock out by, Irish Horses.

CALENDAR OF AGRICULTURE.

The sowing of all grain crops is now to be quickly finished—as oats, barley, lucerne, and flax. Sow grass-seeds on wheat and barley tilths, with light harrows, and a heavy roll. Sow vetches for a second succeeding crop. Top-dress young grains and grasses; and shut-up grass and hay grounds.

Plant potatoes in drills thirty inches apart, on lands well wrought, dunged, and limed. Sow mangel-wurzel, on lands similarly prepared, in the end of the month. Steep the seeds in suds or leys for forty-eight hours, and dry with quick-lime. Use half-rotten farmyard dung, and apply it very liberally. The two crops now mentioned require a very ample allowance. Begin the burning of pared lands, which should be pared during winter, or must be done quickly now: lay the turfs in heaps, and burn moderately, in order to avoid calcination.

Horse and hand-hoc all drilled crops—as wheat, barley, beans, peas, lucerne, and carrots, if ready. Burn, for manure, peats and all refuse substances into ashes, to be applied by the drop-drill.

Fold the sheep ewes, and lambs, on early vetches, winter barley, rye, and watered meadows; or cut the food, and give it to the animals in racks. Confine them over night in a fold, and allow two square

yards of space to each animal, and two nights in one place. Cutting the food may be the most economical method of feeding.

The long days will now require more food for all animals on a farm. Feed cows with steamed food, roots, and chaff; bullocks, with swedes and beet; and young stock, with a certain quantity of the same. Give the oldest calves some of the earliest green food, to teach them to live without milk: use also bruised cake, bruised linseed, and bean and barley meals.

Lambing will be finished this month. Put the oldest on clovers as they get strong. Cut turnips and beet into slices, and give them in troughs, mixed with oats and bruised oilcake. Spare no trouble or expense with young animals.

Fat and aged cattle must now be all sold from the winter stalls. Bacon hogs must be cleaned off; and the young farrows must go on for summer stores, and for early fattening next winter. The earliest lambs will now be for sale as fat.

Begin to plough turnip fallows and clay lands for wheat, at convenient times. Carry to the heaps in the fields all dung remaining about the homestead, and litter the yards afresh.

CALENDAR OF GARDENING.

Asparagus will now be rising, and must be cut so as to avoid injuring the crowns either by too close an incision, or by uselessly wounding the adjoining shoots. As the plants rise, they are thinned to stand three, and then six, inches apart, and even one foot, which will produce a very strong and durable plant, high in colour, full in flavour, and tender in its whole length.

Sow seakale on beds of well-prepared ground—three seeds, in a small circle of six inches diameter; the circles two feet apart; the rows may be single, at four feet distances; or, if double, two feet asunder, to form a bed. Sow lettuce, radish, corn, and small salading, twice or thrice. Sow peas—the Prussian and Scimitar—beans, any most approved sorts, twice; borecole, Scotch kale, and Brussels sprouts; broccoli for winter and spring. Sow, early and late in the month, cabbages and savoys, to supply successions; spinach, repeatedly; silver onions, very thickly, for drawing young; onions for bulbing, and leek, if not already sown; carrots, parsnips, and red-beet—all in the first days of the month.

Sow white and hardy red celery in warm leaf beds; nasturtiums and aromatic herbs.

Sow kidney beans on dry beds after the middle of the month.

Plant potatoes in showery weather on prepared beds.

Transplant lettuces, cabbages, cauliflowers, and seakale: place celery plants, to become stocky, upon beds of very rich soil, chiefly of reduced manure.

Dress all the beds with hoe and rake; earth-up and stiek peas; and attend to neat order.

Strawberry beds, or rows newly planted, must be liberally watered in dry weather.

Flowers in seedlings from the pots are thinned out: plant herbaecous varieties. Dutch-hoe and neatly rake the quarters. Sweep and roll walks in showery weather. Plant or renew box-edgings.

Guano in fine powder, one ounce to a gallon of soft water, is a most useful stimulant to succulent plants of many kinds.

REVIEW OF THE CORN TRADE DURING THE PAST MONTH.

The opening of the past month was very unlike March, and it was only for about one week that the rough drying winds prevailed, which, however, were very serviceable both to the tillage of the land and condition of the wheat thrashed, while several heavy falls of rain have been experienced, sufficient to encourage the hope of more, as the wells generally are low, and the ponds and reservoirs in many places insufficiently supplied. The sowing of Lent corn has proceeded most favourably, and where this was performed early, the young crops have come up very even, and look thriving. The early-autumn wheat, where the planting was thick, looks rather too luxuriant for a heavy crop of corn, and would be better if kept back in this uncertain climate; but, so far as appearances go, everything is full of promise, and fully a fortnight early; but the hay crop cannot be heavy without a good fall of rain. The breadth of wheat this year, by numerous reports, appears considerably diminished, the low prices so long ruling directing the attention of growers to an extended cultivation of malting barley and other spring corn. But it is worthy of note that, after an unusual importation, the stocks of foreign corn are not heavy, and that our principal dependence must now be on what remains in English farmers' hands as a security against any mishap. The favourable turn of prices which we anticipated with the opening of the new year has only in part been realized, which we think has been a good deal owing to the damp state in which the mild and humid winter reduced the samples; but, as the condition is now improved and stocks are getting into firmer hands, there seems no likelihood of a return to the lowest rate of Christmas, though the average now is only 40s. 1d. per qr. Very little change of value has ensued in the course of the month, the decline at the opening being about recovered at the close, the course of the averages only showing a difference of 4d. per qr. downwards. The stormy aspect of politics now seems blowing over, and markets must be left both here and abroad to find their level peaceably. There are, however, very few or none to meet the current rates obtaining here, and America, which not long ago was thought to have accumulated stores which eventually must find vent in the British market, has kept steadily rising, and some quantity of wheat in Liverpool and flour in London has been shipped to New York and other transatlantic ports. France also, which has been a constant source of apprehension, has lately shown an upward tendency in prices—the great emporium, Marseilles, complaining of light arrivals and used-up stocks; while Spain, Portugal, and Algeria continue to be importing countries at higher rates than realized here. The Council of State at Paris continue occupied with the question of the corn-laws with a view to their revision, and there now seems no chance of a return to the sliding-scale, which is

likely to be succeeded by a small fixed duty both on imports and exports. The long absence of a speculative spirit in this country has brought about the same state of things in Northern Europe, where the great stores were wont to be gathered; but these are now wanting, and should any disaster occur in those countries to the growing crops, the whole course of trade would be changed, and England, as far as her ability permitted, become an exporting country.

The following were the quotations in foreign ports on the most recent advices: The price of fine wheat in Paris was about 38s. 6d. per qr. At Nantes the best 62 lbs. per bushel red wheat was worth 38s. free on board; 60 lbs. white, 41s. 6d. The value at Bordeaux was 40s. per qr. The quotation for red Louvain wheat at Antwerp was 42s. per qr., 64 lbs. per bushel. At Amsterdam fine Polish wheat was still worth about 55s. per qr.; red at Rotterdam 46s.; first quality at Königsberg and Berlin 48s. to 49s.; fine high-mixed at Danzig 51s. per qr., and scarce red wheat at Petersburg 41s. At Odessa fine quality about 38s.; at Galatz 33s. 9d. per qr. The quotation at Algiers was 46s. 6d. At New York red Southern brought 50s. per 480 lbs., fine white Michigan 50s. 4d. per 480 lbs., and the best descriptions of flour were selling at equal to 48s. 7d. per sack, or 8s. 7d. per sack above the top quotations of town-made in London.

The first Monday of the month in London opened on a moderate supply of English and small arrival of foreign wheat. The samples on show from Kent and Essex were not numerous, the condition being but little improved. The better prospect of peas, and the prevalence of mild and fine summer-like weather for several days, made an unusually dull market. Some few fine lots were placed at only a little under the previous currency, but generally the quotations were reduced 1s. to 2s. per qr., and very little progress made. Kentish factors, being anxious to clear, would have accepted 2s. per qr. less, but could not find buyers. In foreign, literally nothing was doing. The country reports did not respond fully to these dull advices, Boston and Hull being quite as dear; many, though without activity in sales, did not lower prices, and the reduction at most was 1s. per qr., as at Leeds, Louth, Spalding, Stockton-on-Tees, Gloucester, and some other places. The Liverpool decline on Tuesday was 1d. per cental, without any subsequent change.

The second Monday had a fair supply of foreign wheat; the English arrival being much about the average. Kent sent up a fair supply of samples; Essex but very few. The reduction of the previous week was then confirmed, but without any improvement in the state of business, sales continuing very slow in English qualities, and the foreign trade entirely retail at unaltered prices.

The country reports were again less dull than those of London; several places, as Newcastle, Newark, Hull, Wolverhampton, Lynn, Gainsborough, and Manchester, noting a fair trade at previous rates. Liverpool was unaltered on Tuesday, the last market experiencing a good demand for red oaty American wheat for Ireland, at full prices; the week closing in London with a somewhat improved tone.

The third Monday had scarcely an average supply of millers' wheat, either of home growth or from abroad. The near counties rather fell off in the show of samples; and had it not been for the more confirmed pacific reports, in all probability there would have been a decided rise on the market. As it was, even with fine rains and growing weather, there was a better tone about the trade, fine white samples and choice heavy red bringing 1s. per qr. over the rates of that day se'nnight. In foreign also there was rather more doing, buyers paying full prices for quantities in retail. The country reports, following these advices, were generally improved, though the supplies were more liberal—an average of 1s. per qr. advance being established; Boston, Louth, and Gainsborough making the increase 1s. to 2s. per qr.; but Birmingham, Manchester, and Wolverhampton found the sales made with difficulty; and Liverpool and a few other places were only firm.

The fourth Monday had about the usual supplies of foreign and English wheat. The near counties sent up a fair quantity of samples, especially Essex, the bulk being in improved condition. Trade opened with some tone, but as the morning advanced there was less enquiry. Parcels of Kentish brought the previous rates; but at the close of the market very little was sold; and had it been forced, less money must have been taken. The middling sorts of foreign were easier to buy.

The four weeks' supplies in London have been 22,786 qrs. English, 27,125 qrs. foreign, against 18,886 qrs. English, 17,790 qrs. foreign, in March 1858.

The quantity exported has been small, viz., 344 qrs. wheat, 555 cwts. flour.

The imports for February into the United Kingdom were 226,239 qrs. wheat, 246,965 cwts. flour, against 263,552 qrs. wheat, 309,172 cwts. flour, in February 1858.

The last four weeks' imports into the principal ports of Great Britain, in wheat and flour, have been equal to 186,200 qrs. wheat.

The flour trade, with reduced arrivals, has generally been dull, town prices not having varied through the month, millers, notwithstanding the gradual decline in English, not being able to keep up their quality, from the damp state of the home-grown samples, without a large admixture of fine high-priced foreign. Norfolks have undergone but slight fluctuation, commencing on the first Monday with a small decline, which was recovered on the third Monday. The first quality French samples have been scarce; but the secondary sorts, notwithstanding some advance in France, have been difficult to quit, fair sorts being a difficult sale at 31s. to 32s. per sack; while the best sorts of American are entirely out of the market,

being worth considerably more at New York than in London. The barrels that arrive are inferior, and difficult to quit at any price, having much unsound wheat in their composition; but sound country flour has actually been shipped for New York. The imports into London for the four weeks were 60,532 sacks of country sorts, 2,293 barrels and 5,284 sacks foreign, against 76,098 sacks English, 26,704 barrels and 7,876 sacks foreign, in March 1858.

The barley trade has very little changed in the course of the month. The weather having become warmer, the demand for malting sorts has very much reduced, while the sharp competition between English and Scotch distillers having resulted in favour of the latter, has made distilling sorts difficult to place, or the small proportion of these in the foreign arrivals would have made a brisk trade for such. Low qualities from the Black Sea and Danube have been plentiful, and such as were sweet have gone off steadily at much the same rates; but those out of order were obliged to be sold cheaper, or sent to granary, as there are very many stale oats in store, about equally cheap. The rates in each successive market have so little varied, that it is unnecessary to particularize; but the last market was generally about 1s. per qr. cheaper. The quantities imported into London for the four weeks were 8,953 qrs. English and 40,471 qrs. foreign, against 12,577 qrs. English and 27,575 qrs. foreign, in March 1858. The months import's from abroad into the United Kingdom for all February were 136,727 qrs., against 99,578 qrs. in Feb. 1858.

The supplies of oats throughout the month have been extremely limited; but their relative dearness as compared with other grain, and the quantity still remaining in store, as the consequence of the gluts last autumn, have kept the markets dull, with rather a downward tendency for all but sweet ship corn. We cannot, however, help thinking, that as the season advances, the deficiency of the crop will be felt, and should the least appearance of drought be reported, the purchases in Russia for spring delivery here cannot fail of paying the importers, as good corn in quantity must be had, and Ireland and the near continental ports promise to send but little. Prices through the month have been remarkably even, closing pretty much the same as they commenced. The imports into London for the four weeks were 3,533 qrs. English, 9,953 qrs. Scotch, 10,875 qrs. from Ireland, and 34,267 qrs. from abroad, against 4,701 qrs. English, 4,756 qrs. Scotch, 21,830 qrs. Irish, and 24,750 qrs. foreign, in March 1858. The total foreign imports into the kingdom for February were 41,360 qrs., against 29,690 qrs. in February last year.

Beans have also come to hand sparingly; but the English crop, with the help of old stores, has held out much better than expected; still, with the season advancing, there has been a diminished consumption, and the low prices of maize and barley have kept prices down. The almost failure of the crop in Egypt, under ordinary circumstances, would have made them dear; but with France at hand, ready to supply us on advancing markets, there does not seem much chance of any great rise; though stocks must eventually be worked up very

close, and the retail trade at the season's end may pay holders. Without quoting any positive decline for the month, the tendency has been rather down. The imports into London for the four weeks have been 2,869 qrs. English and 2,978 qrs. foreign, against 3,769 qrs. English and 2,125 qrs. foreign in March 1858.

Boiling peas may almost be said to have been without a market for the whole season, its unusual mildness, as well as the low prices of rice and potatoes, having made the consumption almost unprecedentedly small, and the rates have continued under those for hog feed in consequence. Even these latter, since the decline of the seed demand, have been cheaper to sell, especially maples, which were out of proportion dear. Boilers not being a heavy stock, will, no doubt, now be worked off for horse food, while the high prices of tares for pigeons' may partly attract attention to their use. The imports into London for the four weeks were 869 qrs. English and 654 qrs. foreign, against 1,539 qrs. English and 100 qrs. foreign in March, 1858.

Linseed, with moderate imports and a free export trade, has well maintained its value without any quotable fluctuation; but its dearness has certainly lessened its use, and the last market was easier; but cakes, after somewhat giving way, have found a better sale, the high price of meal encouraging free purchases, and the stocks being very small. Prices of Linseed do not appear likely to reduce much, before large crops in Europe and the East Indies occur in the same season, as the use both here and abroad is so much more extended than formerly.

A very large amount of business of a consumptive character has obtained in Cloverseed of both kinds. The reports from France of a deficient crop turned out true; our own also was insufficient, and the quantities expected from America have been much below the mark. The stocks, therefore, at the end of the present session must be very small, and quite insufficient for speculative purposes. Prices through the month have kept up remarkably well, and holders having almost cleared themselves of new seed will not be likely to force off what remains on hand, with some consumptive trade still in prospect. The high price of white will, however, make it undesirable to hold over. Trefoil has been steady throughout; and tares have brought full prices: though now it is getting late, lots are to be had on rather easier terms. Canaryseed has somewhat recovered from its depression, and does not seem likely again to recede to the low rates at which it has been selling. Mustardseed only sells occasionally to needy buyers. Rapeseed has been firm. Hempseed, carraway, and coriander have scarcely changed in value.

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. 12, 1859	40 11	31 6	22 4	31 2	24 1	24 1	24 1	5				
Feb. 19, 1859	40 10	31 0	23 1	32 11	42 10	42 10	42 10	12 3				
Feb. 26, 1859	40 5	33 11	22 8	31 9	42 2	41 7						
March 5, 1859	40 5	34 0	23 0	33 11	42 2	40 6						
March 12, 1859	40 3	34 4	23 3	32 11	41 8	40 8						
March 19, 1859	40 1	34 4	23 9	30 4	41 3	40 4						
Aggregate average	40 6	34 0	23 0	32 0	41 11	41 2						
Same time last year	45 3	36 4	23 0	32 10	38 3	40 11						

PRICES OF SEEDS.

BRITISH SEEDS.

TREFOIL, new.....	19s. to 22s.
TARES, Winter, new, per bushel.....	—s. to —s.
MUSTARDSEED, per bush., new 12s. to 17s., brown 10s. to 12s.	
CORIANDER, per cwt.....	14s. to 16s.
CANARY, per qr.....	70s. to 74s.
LINSEED, per qr., sowing —s. to 64s., crushing 54s. to 58s.	
LINSEED CAKES, per ton.....	£9 10s. to £10 10s.
RAPESEED, per qr.....	68s. to 72s.
RAPE CAKE, per ton.....	£5 10s. to £6 0s.

HOP MARKET.

BOROUGH, MONDAY, March 28.—Our market during the past week has exhibited increased activity, and for the period of the year a large amount of business has been done. The prevailing scarcity of fine samples of Weald of Kents and Sussex has led to a further advance of from 3s. to 5s. per cwt., and the entire absence of choice East and Middle Kents and Farnhams renders their quotation only nominal.

Mid and East Kents.....	84s. to 100s. choice 147s.
Weald of Kents.....	64s. 72s. " 80s.
Sussex.....	60s. 68s. " 72s.

POTATO MARKETS.

SOUTHWARK WATERSIDE, MONDAY, March 28.

Since our last report, the arrivals both coastwise and from foreign ports have been more abundant; but owing to the mildness of the weather, and the great supply of vegetables, it has caused the trade to remain inactive. The following are this day's quotations—

York Regents.....	per ton 70s. to 105s.
Flukes.....	95s. to 105s.
Lincolnshire Regents.....	50s. to 90s.
Dunbar do.....	70s. to 90s.
Ditto Reds.....	60s. to 70s.
Perth, Forfar, & Fifeshire Regents.....	40s. to 55s.
Ditto Reds.....	35s. to 45s.
Ditto Rocks.....	40s. to 45s.
Foreign Whites.....	40s. to 60s.

PRICES OF BUTTER, CHEESE, HAMS, &c.

BUTTER, per cwt.:	a. s.	CHEESE, per cwt.:	a. s.
Friesland.....	120 130	Cheshire.....	60 80
Kiel.....	126 136	Cheddar.....	60 82
Dorset, new.....	120 128	Double Gloucester.....	56 70
Carlow.....	88 106	HAMS:	
Waterford.....	98 106	York.....	78 86
Cork.....	100 112	Westmoreland.....	78 86
Limerick.....	100 108	Irish.....	70 80
Silago.....	98 104	BACON: Wiltshire, dried 56 60	
FRESH, per dozen. 12s. 0d. to 16s. 0d.		Irish, green.....	48 58

WOOL MARKETS.

Per pack of 240lbs.

Fleeces—Southdown Hogs.....	£18 0to £18 10
Do. Half bred Hogs.....	17 10 18 10
Do. Kent.....	16 0 17 10
Do. Southdown Ewes and Wethers.....	16 10 17 10
Do. Leicester do.....	16 10 17 10
Sorts—Clothing, picklock.....	18 10 19 0
Do. Prime and picklock.....	17 10 18 0
Do. Choice.....	16 0 17 0
Do. Super.....	14 0 15 0
Do. Combing—Wether matching.....	19 10 20 0
Do. Picklock.....	16 10 17 10
Do. Common.....	14 0 15 0
Do. Hlog matching.....	22 10 23 10
Do. Picklock matching.....	17 0 18 0
Do. Super do.....	14 10 15 10

MANURES.

PRICES CURRENT OF GUANO, &c.

PERUVIAN GUANO, (per ton, for 30 tons).....	£12 0 0to £20 0 0
Do. Do. (under 30 tons).....	13 5 0 0 0 0
KOORIA MOORIA GUANO, (66 per cent. Phosphate and 1 per cent. Ammonia).....	5 5 0 5 15 0
ARTIFICIAL MANURES, &c.	
Nitrate Soda (per ton).....	£16 15 0to £17 10 0
Nitrate Potash or Saltpetre.....	29 0 0 30 0 0
Sulph. Ammonia.....	14 10 0 15 0 0
Muriate ditto.....	23 0 0 26 0 0
Superphosph. of Lime.....	5 10 0 6 0 0
Softs Ash, or Alkali.....	11 0 0 12 0 0
Gypsum.....	1 10 0 2 0 0
Colpélite.....	2 10 0 3 0 0
Sulph. of Copper or Roman Vitriol, for Wheat steep, 1st qual.....	£ s. d. 37 0 0to 39 0 0
Ditto, 2nd quality.....	24 0 0 28 0 0
Salt.....	1 0 0 1 5 0
Bones, Dust, per qr.....	1 0 0 1 2 0
Do. 3-inch Oil Vitriol, concentrated.....	0 19 0 0 19 0 0
per lb.....	0 0 1 0 0 0
Do. Brown.....	0 0 0 0 0 0

THE FARMER'S MAGAZINE.

APRIL 1859.

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| A 2 row Cup ditto | 3 10 0 |
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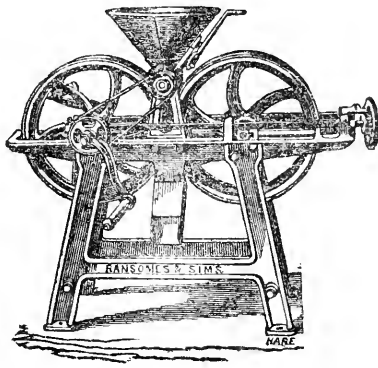
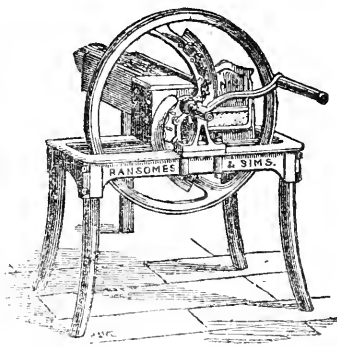
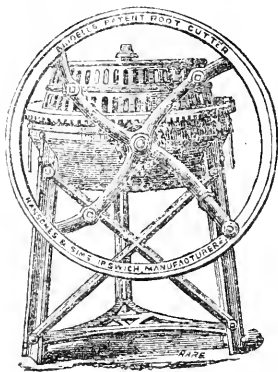
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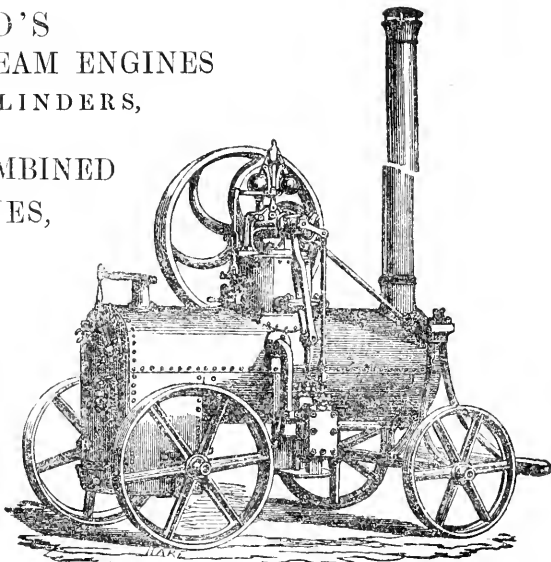
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6 lb. 30 " " " " " " " " " " " " " " " "	0 3 0
8 lb. 40 " " " " " " " " " " " " " " " "	0 4 0
10 lb. 50 " " " " " " " " " " " " " " " "	0 5 0
20 lb. 100 " " " " " " " " " " " " " " " "	0 10 0
30 lb. 150 " " " " " " " " " " " " " " " "	0 15 0
40 lb. 200 " " " " " " " " " " " " " " " "	1 0 0
50 lb. 250 " " " " " " " " " " " " " " " "	1 3 6
60 lb. 300 " " " " " " " " " " " " " " " "	1 7 6
80 lb. 400 " " " " " " " " " " " " " " " "	1 17 6
100 lb. 500 " " " " " " " " " " " " " " " "	2 5 0

Should any Flockmaster prefer boiling the Composition, it will be equally effective.

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"Scouton, near Hingham, Norfolk, April 16th, 1855.

"Dear Sir,—In answer to yours of the 4th inst, which would have been replied to before this had I been at home, I have much pleasure in bearing testimony to the efficacy of your in-

valuable 'Specific for the cure of Scab in Sheep.' The 600 Sheep were all dressed in August last with 84 gallons of the 'Non-Poisonous Specific,' that was so highly recommended at the Lincoln Show, and by their own dresser, the best attention being paid to the flock by my shepherd after dressing according to instructions left; but notwithstanding the Scab continues getting worse. In December I informed the 'Agent for the above Specific,' that the flock was not cured, and that it requires their immediate attention. The Agent informed me they should be at once seen to, but did not do so until five weeks afterwards, and in the mean time the Scab spread over the whole flock, that I never saw such a disgraceful sight in my life; and when the Dresser was sent over to inspect the Flock, he decided on not dressing them again, as one-third of the Sheep had lost half their wool. I then agreed with an experienced dresser in Norfolk to dress the flock, and when he saw the sheep he declined doing them, as they were so very bad, and the time of lambing so near. Being determined to have the Scab cured if possible, I wrote to you for a supply of your Specific, which I received the following day; and although the weather was most severe in February during the dressing, your Specific proved itself an invaluable remedy, for in three weeks the Sheep were quite cured; and I am happy to say the young lambs are doing remarkably well at present. In conclusion, I believe it to be the safest and best remedy now in use.

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"R. RENNY.

"To Mr. Thomas Bigg."

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No. 5, Vol. XV.]

MAY, 1859.

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PRICE TWO SHILLINGS.

DR. HASSALL
ON
THORLEY'S FOOD FOR CATTLE.
FROM THE "MARK LANE EXPRESS," 10th JAN., 1859.

74, WIMPOLE STREET, CAVENDISH SQUARE, 21st December, 1858.

HAVING, on more than one occasion, been requested to make an analysis of THORLEY'S WELL-KNOWN FOOD FOR CATTLE, and to express my opinion respecting it, I placed myself a short time since in communication with Mr. Thorley, desiring to be furnished with certain particulars relating to his Food. Mr. Thorley, who was previously a stranger to me, at once conducted me over his Manufactory, showed me all the ingredients employed, and also the process of manufacture of the article.

I took away with me samples of the food as well as of every ingredient entering into its composition. I have since carefully examined and tested these, and I have also compared the samples procured at the Manufactory with others obtained by myself from other sources.

I am, therefore, now in a position to express an authoritative opinion respecting the composition and properties of THORLEY'S FOOD FOR CATTLE. I would remark of it—

First. That the ingredients used are all of excellent quality, and are purchased without regard to expense.

Second. That the receipt or formula, according to which the Food is prepared, is an admirable one, no ingredient being selected on account of its cheapness, but those only being chosen which are best adapted to fulfil the objects intended.

Having regard, thus, to the composition of THORLEY'S FOOD FOR CATTLE, I find that it possesses the following properties in an eminent degree—it is highly nutritious and fattening—it is a tonic and gentle stimulant, aiding, when mixed with other descriptions of food, materially the digestive powers of an animal—a point of great consequence, since it is an undoubted fact that much of the nourishment contained in the ordinary food given to cattle is lost in consequence of the impaired or defective action of the digestive organs.

Comparing THORLEY'S FOOD FOR CATTLE with other Cattle Foods, with the composition of which I am acquainted, I unhesitatingly assert that it is infinitely superior to any others, at present known to me. In all those of the composition of which I have a knowledge, I have found ingredients to be present which have been added solely on account of their cheapness, that is for the purpose of adulteration, and to the exclusion of other more valuable, but more expensive, articles. In some of the Foods I have detected ingredients which are positively hurtful.

Comparing, also, the samples taken by me from the Manufactory with others procured from different sources, I found a perfect accordance in the composition of both series of samples.

Before bringing this Report to a conclusion, I would notice an objection sometimes urged against the use of Cattle Foods generally, namely, that the price at which they are sold exceeds considerably that of the materials from which they are prepared; this can be readily shown to be a very unreasonable objection. THORLEY'S FOOD FOR CATTLE is a compounded and manufactured article, upon the composition and preparation of which much care, labour, and expense have been and are bestowed. Moreover, the refuse materials resulting from the cleansing, grinding, &c., and which are an entire loss, amount to twenty per cent. To estimate, therefore, the value of such an article merely at the cost of the raw materials is both absurd and unjust.

Neither must the value of this, or any other Cattle Food, be determined by the exact amount of nourishment contained in them; although in the case of THORLEY'S FOOD this is very considerable, but the indirect effects resulting from its employment must be taken into consideration; that is, the effects of the article in improving the appetite, digestive powers, and general vigour of the Cattle fed upon it. By the improved condition of the digestive organs animals may be fed upon coarser and cheaper articles of food, and from which, without the aid of THORLEY'S FOOD, they would be unable to extract all the nourishment which such articles actually contain. I consider, then, that the use of THORLEY'S FOOD is attended, not with an additional, but with a considerable saving of expense.

I am glad, therefore, to be enabled to recommend—which I do strongly and conscientiously—THORLEY'S FOOD FOR CATTLE as a highly important and valuable compound for the feeding of all descriptions of Cattle.

Signed,

ARTHUR HILL HASSALL, M.D.,

Analyst of the Lancet Sanitary Commission; Author of the Reports of that Commission; of "Food and its Adulteration;" "Adulterations Detected;" &c., &c.

From Alfred Brown, Esq., Wandsworth, Surrey, Member of the Royal College of Surgeons, England; Licentiate of the Apothecaries' Company, London; Fellow of the Medical Society of London; late Demonstrator of Anatomy at the St. George's School of Medicine.

Wandsworth, Surrey, Dec. 11, 1858.

Sir,—I shall feel obliged by your sending me another cask of Thorley's Cattle Food. I have been making experiments with it upon one of my milch cows, and think it only fair that I should let you know the results. My cow, before I used the Food, was fed upon hay, wortzel, and water *ad libitum*, and upon this diet she yielded one gallon of milk per day, making two pounds of butter per week. She was five months gone with her second calf; when she had the Food I discontinued giving her the wortzel, and gave her a measure-full (about half-a-pint) of the Food with a peck of damp chaff night and morning; besides, she had as much good hay as she would eat. Upon this diet, in less than a week she doubled the quantity of milk and butter; and in order that I might be sure that this excellent result depended upon the Thorley's Food, I discontinued it, and returned to her former diet, and she speedily went back to the gallon of milk per day. After waiting about a fortnight, I again returned to the Thorley's Food, and in a few days she increased to two gallons of milk per day. This experiment I repeated several times, and with the same results. I have tried the Food upon other animals—horses, sheep, &c.—and with the most satisfactory results. I have also analysed the Food, and find that it contains nothing that would in any way injure the system or constitution of cattle. You are at liberty to make any use you please of this communication, and I am, Sir, yours, &c.,

To Mr. J. Thorley.

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ASSIGNMENTS.—The Policies are payable to the Registered Holders, whereby much expense and inconvenience is prevented.

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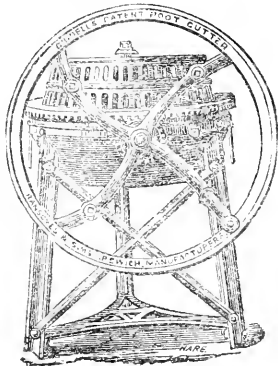
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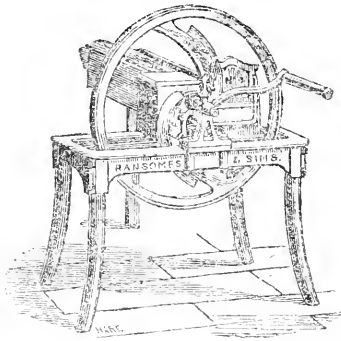
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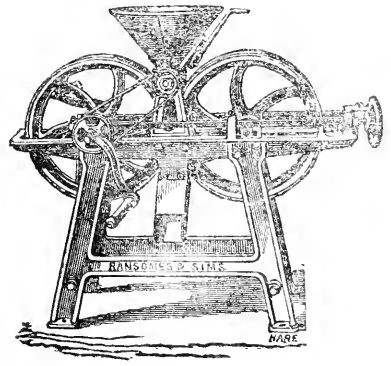
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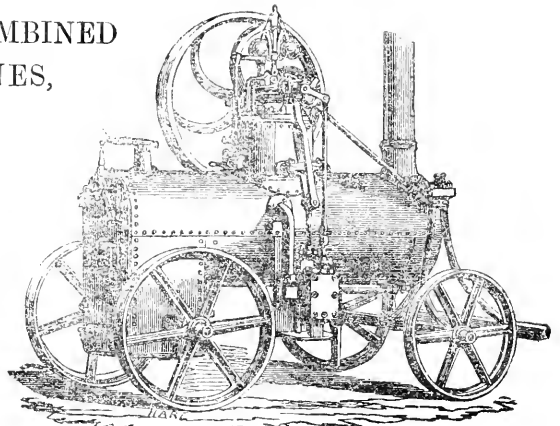
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THE FARMER'S MAGAZINE.

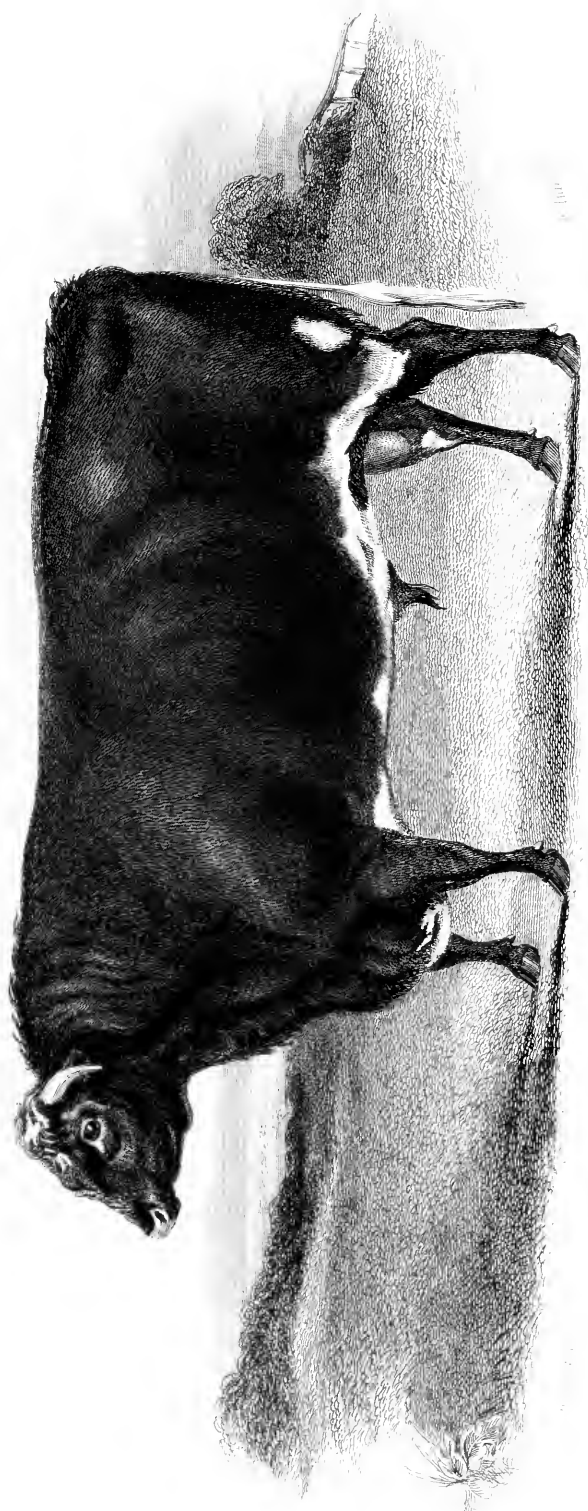
MAY, 1859.

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THE FARMER'S MAGAZINE.

MAY, 1859.

PLATE I.

CAPTAIN SPENCER, AND SUNBEAM.

ENGRAVED BY T. B. HUNT, FROM A PHOTOGRAPH BY BANNISTER, OF CARLISLE.

Although Captain Spencer is better known to the world by the triumphs of Sunbeam and Seagull at Biggar and elsewhere, he is gradually establishing a claim to rank among the best owners of English Shorthorns. At present his herd only numbers about fourteen, but four or five of them are plums which would hold their own anywhere. One of the earliest large purchases we remember his making, was at Mr. Grenfell's sale in 1857, when he gave 150 gs. for Lizzy a four-year-old cow, by Fourth Duke of York (10167), dam Louisa by Cramer (6907); and 60 gs. for her red calf, Sappho, by Prince Duke (13507), who was only twenty-three hours old at the time. At the Cobham sale again, he went in for her other daughter the elegant Leila, by Count Glos'ter (12650), and

the mysterious telegraph between him and Mr. Strafford ended by his being declared the purchaser for 170 gs. At Mr. Wetherell's sale, April 19, he appeared as the successful candidate for the beautiful heifer calf Bloom, by Lord Mayor (14828), out of Lucy at 105 gs.; and as Leila has come home with a bull calf by Marmaduke, and is going to Mr. Bolden's Third Grand Duke, there is no fear for the future of the Distinguon Herd. John Irvine, his greyhound trainer, and in short his factotum, looks after them, and we hope in due time to see his honest face beaming at the sight of the prize ribbons in a Royal Show Yard, as it has done so often already when the last Biggar Cup ties are ended.

PLATE II.

FIFTH DUKE OF OXFORD; A SHORTHORN BULL,

THE PROPERTY OF THE RIGHT HON. LORD FEVERSHAM.

Fifth Duke of Oxford, bred by the late Earl Ducie, and calved March 6th, 1853, is by Duke of Glo'ster (11382), dam Oxford the Eleventh, by the Fourth Duke of York (10167), out of Oxford the Sixth, by Second Duke of Northumberland (3646)—Oxford the Second, by Short Tail (2621)—Matchem Cow, by Matchem (2281), &c.

Duke of Glo'ster, also bred by Lord Ducie, was calved September 14th, 1850, and got by Grand Duke (10284), dam Duchess 59th, by Second Duke of Oxford (9046). At the memorable Tortworth sale, on the decease of Lord Ducie in the autumn of 1853, Duke of Glo'ster was sold to Colonel

Morris and Mr. Becar, to go to America, for six hundred and fifty guineas.

Oxford the Eleventh, bred by Mr. Bates, was calved August 25th, 1849, and sold to Lord Ducie at the Kirkleavington sale, in May, 1850, for a hundred and twenty-five guineas. On his Lordship's decease she was bought by Mr. Tanqueray for two hundred and fifty guineas; and again at the Hendon sale, in the spring of 1855, was transferred to Mr. Gunter for five hundred guineas—thus, curiously enough, doubling her price every time she was put up. Oxford the Eleventh died at Wetherby during last summer.

Nothing struck us more at Tortworth than the extraordinary prices given for the very young stock, bulls, and cow calves of a few weeks old. We have even now a vivid recollection of the prolonged *O—h's!* of admiration, and yet more genuine astonishment, to which the hammer occasionally fell. Lord Feversham in this keen contest secured only three lots, but these included "Gloucester," the Paris prize bull of 1855, for which his Lordship gave a hundred and twenty guineas, and "Fifth Duke of Oxford," booked to him at three hundred. They were both calves of a few months old at the time. A portrait of the former appeared in the Magazine in June, 1856, and we now proceed with the claims of that of his companion.

In 1855, Fifth Duke of Oxford took the first prize of £5, at the Cleveland Show, as the best two-year-old bull.

In 1856, at the Paris Universal Exhibition, he was awarded a bronze medal, which reads equal to a very high commendation. The over-feeding prohibition, however, was enforced on this occasion, and Lord Feversham's stock, amongst that of some other exhibitors, excluded from competition.

In the same year, at the Rotherham Meeting of the Yorkshire Society, Fifth Duke of Oxford took the second prize of £10 for bulls of any age, Mr. Ambler's famous Grand Turk being preferred to him.

In 1858, at the Chester Meeting of the Royal Agricultural Society, he took the first prize of £30 as the best Shorthorn bull, beating amongst others Mr. Barrowby's Marc Anthony, Mr. Wetherell's Statesman, Mr. Fawkes's Sir Edmund Lyons, and Sir Charles Tempest's Napoleon.

In the August following, at the Northallerton Meeting of the Yorkshire Society, he took the first prize of £25, again beating Statesman, Marc Anthony, and Napoleon.

We wrote thus of the Duke at the Chester Meeting: "The best bull was undoubtedly the best bred one in his class, coming direct from the Bates' blood, as preserved by Lord Ducie. But he was yet quite a contradiction to look at. Of immense size certainly, but very coarse in appearance, with a plain head, a drooping horn, and big joints, the Duke of Oxford owes his success almost entirely to his quality. This was pronounced to be wonderfully fine. Seldom was there a beast that handled so well, and this of itself proves his high descent. He is not, however, an animal to please the eye; while his dam, we believe, had the same ugly straight horn and mean head." Mr. Robert Smith in his *Journal* report says, "the immense substance of this bull, together with his fine touch, must have gone far to establish him in so high a position." Perhaps Mr. Davis has a little flattered him.

THE HERDS OF GREAT BRITAIN.

CHAPTER V.

CAPTAIN GUNTER'S HERD.

A very painful chord was struck at the Yorkshire Agricultural Meeting of '49, when hundreds of friends who expected to grasp him once more by the hand, and to enjoy the half-sportive, half-sarcastic lecture, on each prize beast, of "the old man eloquent" of Kirkleavington, learnt for the first time, that he had gone to his rest, and that their Shorthorn festival was on his funeral day. His heart was with horn and hoof to the last, and there was no "cruel Phyllis" to cross him in *that* love. Those who have strolled with him in his pastures, can recall how the cows and even the young heifers would lick his hand, and seem to listen to every gentle word and comment, as if they penetrated its import; and even when the last struggle was nigh, and he could wander amongst them no more, he reclined on some straw in the cow-house, that his eye might not lack its solace.

Now, that perhaps less prejudiced but not more clear-cutting brains are left to work their way up that channel of science, which he buoyed out, each year confirms the belief that he was not so very far wrong, when in speaking of one of his best Duchesses, he said to Lord Althorp,

"The destiny of Shorthorns depends on this calf; this slender thread of a calf."

Still, although he had got as far as (63) he had made but little figure with the Duchesses, when he moved from the Tyneside to Kirkleavington, whither Red Rose who had been bought from Mr. Hustler, accompanied him. She was three removes from Favourite on one side and two on the other, and from the union of her and the Earl (616) came second Hubback (1423). His idolatry for this bull did his herd no small harm; and it was only when he found that he had lost 28 calves in one year, solely through lack of constitution, that he began to cast about, and in vain applied to Mr. Whitaker for his famous Frederick. That gentleman took Second Hubback for a time, purely to oblige his friend; but as if to show the perverse whims of fortune, the stock of no other bull made such prices at his sale. Perhaps on no occasion was Mr. Bates so offended with any one as he was with poor old Coates, when in 1828, he met him with Mr. Whitaker and Colonel Powell of Pennsylvania, in the yard at Greenholme. His aim was to get him, as a great authority, to go and lay his hand, in the presence of that pioneer of our Shorthorns in America, solemnly on the bull, and speaking from the hoary depths of ex-

perience, to proclaim him quite equal to the First Hubback; but the author of the "Herd Book" was not a man to speak against his convictions, and not one step would he stir.

In the following year, Mr. Bates saw the merits of the Princess or St. Albans tribe (who had recovered the quality which Jupiter lost), so keenly at Mason's sale, that he determined, if possible, to get his new cross from it. At that time St. Albans, who went direct to Favourite and Hubback, missing the dreaded Punch, was about fifteen years old, and he had been let for three years into Northumberland. Mason had got him in a sly way at first for £20, through a butcher, whom he sent as his agent; and when Mr. Wood was at Chilton three years after, and only caught a glimpse of his head, he exclaimed "*Why there's my old Prince; he was bought to kill;*" and sure enough it was Prince, but canonized in life as "*St. Albans!*"

How to bring about his long-cherished combination of the Princess of Barmpton, and the Duchess of Ketton blood, was now the problem which puzzled the lord of Kirkleavington, and which Belvedere so happily solved. Oddly enough, this bull had been living only ten miles off him, and for two long years his friend Mr. Atkinson Greenwell had urged him to go and look at him. One day he did condescend to drive over, and strange as the coincidence may seem, the moment he in his turn only glanced at his head through a square hole, he knew that it was the blood he was seeking; and he said to himself, "*Thou art mine if money 'll buy thee.*" And buy him he did, then and there, for £50, which he drew in notes from his pocket, and permission to "*send cows to the bull while he lives.*" The man demurred when the money was paid, and said rather sorrowfully to a friend afterwards, "*I might as well have had a hundred from Tommy Bates; he was so very keen of him.*"

The Waterloo and Wild Eyes were fresh additions about the era of Belvedere, from whose cross with Red Rose 9th came Cambridge Rose 1st; and so well did it nick, that Belvedere was put on her in turn. At the sale, however, this tribe was reduced to Cambridge Rose 5th, and her two calves by Third Duke of York. The 6th is still to remain as a memento at Cobham, where she has so well kept up the line in female tail; while the 7th just took the opposite line in Mr. Bolden's herd. The great triumph of Belvedere was still to come from another cross with his own daughter, Duchess (34), who beat Necklace at York. She had broken her fore-leg, and Mr. Bates was within an ace of selling her to the Americans, but luckily Mr. Whitaker got him off it; and she lived to produce the Duke of Northumberland, a few months after. With the exception of this mighty roan, she never bred any but red and whites, and Mr. Bates was determined to try the effect of a third Belvedere cross with his prize yearling at Oxford, who was own sister to the Duke of Northumberland, if she had not been prematurely choked with a turnip. To the eye of a well-known authority on these matters, "*Duke*" looked a very delicate calf at five months; but his owner, strong in the faith of the double

Favourite cross in Comet, which he had here striven to emulate, drew himself proudly up, and said, "*Well! Sir, I have the greatest hopes of him.*" After all his honours, he came to no very glorious end, as he had been kept low for the purpose of being put on Cleveland Lad's stock, and he died fairly maw-bound from the effects of some mouldy hay; leaving the 2nd Duke of Oxford as the inheritor of his honours.

The Oxford tribe sprung from a cow by Matchem, supposed by St. Albans, whom Mr. Bates accidentally bought after Mason's sale. He did not admire his choice, and when she had bred a calf to Duke of Cleveland, who ripened into the Oxford premium cow, she was packed off to Darlington. Mr. Bates's lucky star was in the ascendant that market day, as no one would bid within £2 of the £11, which he had set on her, and she afterwards calved Cleveland Lad, Cleveland 2nd (the sire of Grand Duke), and Oxford 2nd, all to Short-tail by Belvedere. Her Oxford premium cow was deficient in girth and gaudy behind, and in fact her owner was so ashamed of her in that point, that when she was beaten by Bracelet at Berwick, he hung not "*a calf-skin*" but a horse rug "*on those recalcitrant limbs,*" and vowed he would show her no more. Failure as she might be, there was no mistake as to the cross between the Duke of Northumberland and her half-sister Oxford 2nd, resulting as it did in that fine bull, 2nd Duke of Oxford, who was put on the Duchess tribe, and got five out of the eight plums on the Kirkleavington day.

Mr. Bates had two very favourite maxims—one that he "*could find forty men fit to be a Premier, for one fit to judge Shorthorns;*" and the other that there was "*no place for Shorthorns, like the Valley of the Wharfe.*" The late Mr. Whitaker, and Mr. Fawkes, of Farnley, have proved this to the full; but it was left to Captain Gunter to found a second Kirkleavington on its banks, and to vow that eternal allegiance to the Duchesses and the Oxfords which their great founder had done. His Wetherby Grange estate is well adapted for its new colony, which moved there in the August of 1857, from Earl's Court near Kensington. It consists of 600 acres on both sides of the river, 400 of which are kept in grass. The house once belonged to "*Kit Wilson,*" the owner of Comus and the father of the Turf, and some of his horses were trained in the Park Woods, sacred, in the terms of the time-honoured toast, to "*The Bramham Moor and 25 couple,*" flank it on one side, and overhang the river as it steals along towards Thorp Arch; and the Captain was just returning in his pink, from "*the run of the season,*" as we entered the foldyard with his steward, Mr. Knowles.

It was at Tortworth that the latter confirmed the rich experience he had gained under Mr. Thomas Mason at Broughton, and it was thence that he gathered the germs of that herd which he has so ably helped to found for his new master. Tortworth, on August 24th 1853, was a veritable Bunker's Hill removed. England was pitted against America once more—the guineas of the old country against the "*almighty dollars*" of the new. Messrs. Morris and Bear bid by their agent; but Mr. Thorne

did his own business, in a cool Quaker-like-style, with which it was almost hopeless to cope. His first English purchase for Thorndale was a 14-guinea bull-calf at Captain Pelham's sale, which he afterwards sold for upwards of 300 gs. to the West of America. It is calculated that he laid out at least fifteen thousand in five years on Shorthorns; and he bought up fifty-two lots when the Morris and Becar confederacy was dissolved by the latter's untimely death, at prices which had hitherto only been read of by his countrymen, in the English prints.

Previous to the Tortworth sale, Captain Gunter had only a few Alderneys and ordinary Shorthorns, and he had not made up his mind as to whether he should buy on that day; but the bitter complaints of some Gloucestershire farmers, who shared his waggon, as to the American's getting Duchess (59) fired him into action at last. He accordingly bid 200 guineas for the twentieth lot, Duchess (64), but it was hardly taken, and his 400 gs. was soon left in the rear by the Transatlantic rivals. He did not touch the 700-guinea Duchess (66), but Duchess (67), the fifteen months heifer by Usurer out of Duchess (59) (the highest priced female at the Kirkleavington sale), fell to his nod for 350 guineas, and then Duchess (70) by Duke of Gloucester (11,382), out of Duchess (66), followed suit for 310 gs. She was only a trifle over six weeks, and the Americans had no idea of leaving her; but as one of them said afterwards, it was "the way in which that other bidder said 'and ten guineas,' almost before my bidding was out of my mouth," that made him falter and give in. It was with these two, and Duchess (69) by 4th Duke of York, whom he afterwards bought privately at nine months for 500 gs., from Mr. Tanqueray, that Captain Gunter commenced his herd. Duchess (67) was sent at a 25-guinea fee to 4th Duke of Oxford, and Duchess (69) to Mr. Tanqueray's Duke of Cambridge, who was afterwards so famed at Fawsley, and Duchess (72) and Archduke were the respective results. His next purchase was the 6th Duke of Oxford, at Hendon, for 200 gs.; and his dam Oxford 11th for 500 gs. more, when she was just four years old. He had originally intended to have bought the Duke of Cambridge, but Mr. Strafford's sand ran out, in favour of the Fawsley baronet, who, strange to say, had *his* eye rather on the 6th Duke of Oxford. Lord Feversham had shown his opinion of 5th Duke of Oxford by giving 300 gs. for him as a five month's calf at Tortworth, and the judges twice over last year, at Chester and Northallerton, confirmed his Lordship's dashing decision, *in Banco*.

The farm-buildings at Wetherby are on the right-hand side on the top of the hill, as you cross the bridge in the direction of Bramham Moor. In Mr. Wilson's time, they were used as a kennel; but their primitive character is fast disappearing, under the hand of the stone-mason. At present twelve female Duchesses, three Duchess bulls, and two Oxford bulls are housed there, but two of the latter were let. It is in fact entirely a herd for letting, and not for selling. Captain Gunter candidly says that a thousand guineas would not tempt him to sell one of his cows at all in England, or

abroad without a guarantee; and as the tribe are remarkably prolific, we may expect to see the numbers stretch away into an almost infinitesimal series. It cannot be said of us that we

"Lisped in numbers, and the numbers came,"

and having been plunged into utter despair at first, there was no hope for it but to commence with Duchess (67), and to ask to have her and her progeny out by her side. And out they came accordingly, into the field where the Wetherby Show is held, preceded by the old cow, whose head and waxy horn at once told her descent. Her oldest daughter Duchess (72), is a roan, and the first calf Captain Gunter ever bred; and her bull-calf Archduke 2nd, by 6th Duke of Oxford, is let to Mr. Langston, M.P. The white Duchess (75), by the same bull, out of Duchess (67), was third in the array, and the handsomest of the three. In her general style, her beautiful breast, and rich coat, she reminds us not a little of Stanley Rose. Then her sisters the twins (78) and (79) came struggling out with the herd boys. The roan had an especially fine coat, and a very fawn-like head; but, perhaps, in all its points, the white was the neater of the two. The old cow has made good use of her time, as, in addition to this quartet, she has lost a bull-calf and is in-calf again. And so having traced the progress of the first Tortworth bid, we went gaily on to the second, and Duchess (70) marched out to bear her witness. She retains all the original colour of the Duchesses (for there never was a white one before Duchess (50), and has the same beautiful expressive head, and nice hair, but her hind-quarters are not quite in keeping with her fine shoulders.

The doctrine of chances was never so strangely exemplified as in her grandam Duchess (55), who was bought by Earl Ducie, when six years old, as a doubtful breeder at the Kirkleavington sale. Mr. Bates had been wont to crab her dam, because she was by Norfolk, for whom Mr. Fawkes had given the then great sum of 120 gs. at Mr. Whitaker's sale. His inconsistency was all the more striking, as he had himself purchased Norfolk's dam Nonpareil for 103 gs. there, and when he came out such a crack bull, with one of his usual impulses, he sent off Duchess (33) and five others to him forthwith. The Messrs. Booth and Torr had a strong notion of going as high as 300 gs. jointly for Duchess (55); but the prospect of her breeding seemed so very problematical, that they let her pass them at 105 gs., almost without a regret. In the following year, she lost her bull-calf to Usurer, as she fell ill of the local epidemic from which she had escaped scathless her first year, and which caused his lordship to lose no less than sixty calves. They were slunk away in a painless manner, as if under the effect of an irritant poison, and a less lion-hearted man than the Earl would have thrown up the cards in despair. Before his lordship bought this cow, she had bred Mr. Bolden's first thousand-guinea Grand Duke; and Duchess (64), who was resold at Tortworth for 600 gs., then in-calf of 2nd Grand Duke, who also brought Mr. Bolden a thousand. This double dam and grandam wreath seemed enough for one cow; but she proved at the Kirkleavington sale to

be five months gone in calf with Duchess (66), who also crossed the Atlantic with 700 gs. on her head—a sum never before attained for a female. Duchess (66) remained at Hendon for a considerable time, and calved a heifer to the Duke of Gloucester, for whom Captain Gunter offered 500 gs. in vain; and she had not only twin heifers to the same bull next year in America, whither he departed at her side, but has bred regularly ever since.

But we must hark back. Duchess (70) was accompanied by her two calves—the red and white (73), and the roan (77). Both are by 6th Duke of Oxford, and the elder one, which wore the first prize ribbons at Wetherby, last autumn, had the more substance, and the younger the more elegance of the twain. On the whole we preferred the latter, and it needed only a sight of her to prove that there was no degeneration in the Duchesses, and that there could be no mistake between mellowness and looseness.

And then we got among the Duchess (69) tribe, and as the old cow had calved her fourth that morning, we waited, in due course, on her; and her Duchess (70), a thirteen-months heifer, came out first to do the family honours. She is wonderfully good over the loins, and looks a milker even now. Her dam is very great in this respect, and they had to milk her for some time before she calved. She was lying down after the labour of the day, and hence, though we could not fully judge of her fine length, there was enough to catch the eye in the gentle grandeur of that head, which was specially modelled for Mr. Brandreth Gibbs's testimonial. In quality she was quite equal to the rest of her tribe, but on a larger scale altogether.

We asked in vain for Oxford 11th, but she was struck with lightning in the park last July, and died soon after of apoplexy. She had bred six bulls, one of them Lord Feversham's Royal prize winner, and she was in calf to her son (6th Duke of Oxford) when she died. Of her three bull calves in Captain Gunter's hands, only one, Grand Duke of Oxford, by 2nd Grand Duke, has come to maturity: and it was with him that Prince Albert dipped into the Bates blood in 1857, and Colonel Kingscote in 1858. One of her two by Duke of Cambridge was born dead; and the other, Duke of Oxford, met with a most singular end at Earl's Court. A rat had got into his trough, and frightened him so that he ran out of the shed, and in trying to jump the rail into his paddock he fell on his head, and fairly splintered his horn into his brain. This bull-breeding propensity does not run in her son 6th Duke of Oxford's veins, as hitherto ninety per cent. at least of his get have been heifers. We had scarcely emerged from the presence of Duchess (69), when he appeared, and it was not difficult to guess from whence all that richness of hair had come to the stock. He was a perfect Esau at his birth, and in this respect he is perhaps superior to his brother, but, unlike him, he has never been shown. The first three of his stock were born in Canada West, and one of them won the first prize at Toronto.

And now having got rid of the night-mare numbers, which might well make us one of those

“ Who dreads to speak of 98,
Who trembles at the name—”

we got once more among the heifers; and Fair Maid of Wetherby, by The Buck, out of Mr. Combe's Flirt, by Puritan, and Moss Rose, were the fresh introductions. The former of these two was commended at Northallerton, and the latter was second in the same class to Windsor's splendid daughter, Queen of the Isles, who beat Nectarine Blossom, Great Mogul, Fifth Duke of Oxford, Royal Butterfly, Queen of Trumps, Rose of Athelstane, Maid of Athelstane, and, in short, every winning animal in the yard, for the special £20 prize. Such a defeat is far better worth recording than scores of lesser victories. Many have differed as to the merits of Captain Gunter's two; but we decidedly go for the roan Moss Rose, who is the thicker, though perhaps not so level, as her companion. Her shoulders and head are perfection, and she has a proud style of showing herself, which is some points in her favour; and we have seldom seen a greater coquette in this way. Her style and quality all comes from Sixth Duke of Oxford, as her dam Red Rose is a very mean-looking cow, but a wonderful milker. The Duchess of Oxford, a thick square beast, by Fourth Duke of Oxford, and purchased at Mr. Sainsbury's sale, followed her; and there were some historical recollections connected with her Badminton brother. He not only won the £100 gold medal at Paris, for the best animal of English breed, beating Mr. Stratton's white Smithfield gold medallist of '56; but he was so toothsome in death, that the French committee awarded the roast beef, and, we believe, the soup prize to his remains; whilst a Highlander, also from Badminton, was victorious in the boiled beef *post mortem*. We only saw one of the Grand Duke of Oxford's get, and that was a pretty-looking bull-calf, Earl of Oxford, with all the hereditary Duchess marks, and then we were summoned to a levée of eight calves in the barn. Red Blossom, sister to Moss Rose, soon caught the eye; but although she is a better toucher than her sister, she has not the same substance and grandeur. There were also our old friends the twins, and Mr. Knowles soon composed a tableaux of these two venerable aunts with their neat dark roan niece, Duchess (80), between them. Then there was Modesty, and Ada, a daughter of Acorn, by Handel, a fine but leggy cow, who was drawn up on parade at the barn-door as we came out. Her dam, Apple, was sold for the Emperor of the French's dairy, and gained, it was said, the honour of having her milk reserved for the heir to the throne. With her this herd of full fifty head came to a close, and we did not care to adjourn through the pouring rain to the pigs for an afterpiece. Hence we contented ourselves with hearing that in 1853 those styes of Ducie and Wiley blood made £400 in prices and prizes in one year, and that there were eleven medals among them; and on the morrow we went our way once more, in search of fresh herds and pastures new.

CHAPTER VI.

THE TOWNELEY HERD.

A weary wait of two hours, on a wet day, at Todmorden station, with nothing but the chimneys of a dull little manufacturing town to gaze at, is not a cheery reminiscence in any man's life; and never was railway-whistle so welcome as that which told us that we were once more on our way towards Towneley. The route lies among wild gulleys and hills, clothed to their summits with fir and heather; but a valley at last opened to the right, and till the countless chimneys of Burnley (which have no notion of consuming their own smoke, and play Old Harry with fleeces in consequence) began to rear themselves in the murky distance, we were under the delusion that for the remainder of the day, at the least, we had exchanged mules and spinning-jennies for sheep and shorthorns.

The Towneley domains, which have a private station of their own, extend right down to the town, and share with it in the discomforts of one of the wettest and rawest climates in the whole of Great Britain. Pendle Hill, whose fame has long been preserved in the not very smooth-running couplet—

"Pendle Hill, Pennykaunt, and Little Ingelborough,
Are the largest of the hills, if you search England thorough."
rises guardian-like over the town; and a long avenue from the front-door of the hall points right away, past the gamekeeper's cottage, to another range of grouse-hills on the north. The Colonel's home-farm consists of five hundred acres, chiefly grass. It is about one of the last "bowers" in which a veritable butterfly would think of being born. The land is on a cold blue clay subsoil, and the Government draining has done but little for it. Harvests do not "laugh and sing" there, as corn cannot be got to ripen on it, one year in six; and mangel wurzels will have nothing to do with it; and hence nearly all the root-food and straw have to be purchased from Ormskirk. The herd has had a fearful battle to fight, in order to compete with the rich grazing counties, and but for the undaunted energy and science of the bailiff, Mr. Joseph Culshaw, backed up by the most liberal and spirited of masters, it could never have stood its ground, and brought so many great rivals low in their turn.

Mr. Culshaw was bred and born at Broughton, and used to run about and help his stepfather, who was herdsman at Mr., now Sir Charles, Tempest's, before he could even milk or fasten up a cow. His peeps at the different herds on the banks of the Wharfe had gradually inoculated him with a burning taste for the thing. He was never weary of telling Bob Gill, the farmer, that they ought to have something beyond mere dairy cows at Broughton Hall; and when Sir Charles bought Verbena and her daughter Vestris, and he was sent with the latter to the best bull Mr. Whitaker had at Greenholme, his future destiny was clear. No ambassador to a Peace Congress had a higher sense of his responsibility than "little Joe" that day. The cow lay down about twenty times in the last three miles, and the season was off her

when she did get there; but those toils and woes were forgotten when Mr. Whitaker, admiring the lad's enthusiasm, showed him all over his herd. He returned home repeating "*April Daisy*," "*Whiteface*," "*Pretty-face*," "*Nonpareil*," and so on to himself, to beguile the road, and at last ventured to speak up to Sir Charles, who promised that he would go over and see them, and take him again. The visit never came off; and the appointed day dawned bitterly on the lad, when after lying awake all night, he received a message to the effect that Sir Charles and his party had changed their minds. However, Bell by Bertram was purchased on the Broughton account, at Mr. Whitaker's sale; and it was under Mr. Thomas Mason, who soon afterwards came as agent, that the future Towneley herdsman gleaned his chief experience. Twenty-four years of his life were thus spent; then followed a year and a-half with Mr. Ambler; and in 1849 he came to Towneley, and, working on the good material Messrs. Eastwood and Strafford had previously collected for him, he soon found himself at the head of a herd which was destined to play no second part in the annals of Shorthorns.

The germs of it were some ten or twelve cows and bulls, which Mr. Eastwood handed over to Colonel Towneley. Among them were Ruby, the last he bred; Gem, a great local winner, by Harlsonia; Bessy, the dam of Frederick, who had four calves within one year of coming to Towneley, and then twins again; and also Gipsy, and Buttercup. The latter had bred Horatio by Hamlet the year before, and she then calved Butterfly, who played second to Ruby's first, twice over, at Exeter and Windsor. Colonel Towneley won with Ruby, as well as Duke of Lancaster (both of them by Lax's Duke), in his first year, at the Yorkshire Society; and it was at a meeting of the same society that her calf Ruby IV. gave Booth's Queen of the May (who is, we are assured, not "slightly down in one hip") the first of the only two defeats she ever sustained. This celebrated cow also bred Richard Cœur de Lion (whom we were requested to abbreviate into plain "Dick"). They also had another cow named Ruby, who was purchased at Lord Craven's, and won the Smithfield Gold Medal. She was a rich red roan, very like Booth's Hope, and her daughter, Jenny Lind, is now in Mr. Grundy's hands. In addition to the above, came Cressida, for 110 gs., at Mr. Parkinson's sale, where Lord Ducie went as high as 105 gs. for her; and then the small but select herd which Mr. Strafford purchased from Mr. Bannerman, who had them from the late Mr. John Booth, of Killerby. Among the latter were Alice, Beauty, and Mantle, in calf of Beauty's own brother Valiant. A hundred guineas were also well laid out at Kirkleavington on Duchess (54), and she proved in calf of The Duchess of Athol, who went with her half brother, 2nd Duke of Athol, to America, for 500 guineas, and from this sale early in '53, the revival of Shorthorn prices undoubtedly dates.

Our first introduction, on reaching Towneley, was to Vestris III., who won the head prize in the cow class at the Paris Universal Show, when she was

only two years and three months old, and had calved but two months before. Mr. Douglas's Rose of Summer was her principal opponent, and in the same year she was second to Victoria at Salisbury, with Moss Rose and Nectarine Blossom in her wake. She has had three living calves, and was just within twelve days of calving to Baron Hopewell. There is very rich quality of flesh and hair in her, and she has plenty of bosom and substance to fill the eye, but perhaps her hips are a little too prominent, and she might have been longer in the quarters. Pride, who stood near her, was very close on calving to Frederick. She was purchased at the sale of Mr. Grenfell's herd, and came there from her breeder Lord Ducie. These two stood at the lodge, and a drive of about half mile up the avenue brought us to some farm buildings on the left, which are termed Jacob's Barn, not from any Scriptural connection, but from a farmer of that name who rented it. Foremost among the ten who were housed there was the patriarchess of the herd, Butterfly, by Booth's Jeweller out of Buttercup. She was the first to show, and, with the exception of a free martin, she was the first female Col. Towneley ever bred. She still retains her fine gay appearance, but the calf-bed has protruded so much, that she has been obliged to lie low, with her head on a boarded frame, in order to keep it in its place. Her fore-quarters are beautiful, and the rump, which has got somewhat swelled and disfigured by perpetually rubbing against the wall in her new position, serves as a foil for them. The renowned Master Butterfly is the second of her five calves, and Royal Butterfly the last; and at present she is in calf to Butterfly's Nephew. Her public career has been, as the theatres have it, one blaze of triumph. Among her thirty prizes, she won all the female ones at the Royal Society, and confirmed the yearling heifer one at Thirsk; and she had the honour of beating Booth's Windsor and Bridesmaid for the Irish Agricultural Challenge Cup the time she finally won it at Armagh. It must be, however, stated, in justice to this pair, that when they went to Blackburne, and won the Towneley Challenge Cups, they had beaten the Colonel's herd (which were not in the Cup competition) for the Society's medals. She was also among the four at Sheffield, which won Mr. Bright's the silversmiths' prize for the best lot at the Yorkshire Society, and the time-piece in the dining-room at the hall is the record of that triumph. Two of her Irish cups form an important feature in the Towneley plate chest, to which, among others, Roan Duchess 2nd has contributed a Dublin Challenge Cup of £120 value, and Beauty's Butterfly that Durham Cup, which was given by Lord Adolphus Vane last autumn.

Three heifer calves, to wit, Vestris 5th, the white Precious Stone, and Butterfly's Decorum, all by Master Butterfly 4th, who was sold about a year since to the Emperor of the French, were turned out next, and a very nice trio they made. Precious Stone had a beautiful long top, and is as level as a die along it; Vestris 5th was very neat and good; and Butterfly's Decorum is the thickest of the lot, with a wonderful chest, great in the fore flank and remarkably smart in the head. A red bull-calf, Precursor, by the same bull out of one of

Lord Ducie's Duke of Glo'ster cows, shows well for the cross, but still we should have liked a little more length in the quarters. The bull-boxes then discharged their tenants in succession, to wit, the gay Master Proud-fellow, Butterfly's Nephew, a young bull with wonderful width of breast and back, and Master Butterfly 5th, the youngest bull-calf Master Butterfly has left in England. The latter is a very stylish red, with a rare forehead, and well represents his sire. He is out of Cameo, a half-sister to Butterfly, and 400 gs. was refused for him when a yearling. He took the first prize at the Wharfedale Agricultural Society; but as he lost eleven months in age, he has not been shown as a yearling. Royal Butterfly, own brother to Master Butterfly, holds his court in the central barn, from which he marched out, every inch a king. He is very like his renowned brother, but rather thicker in flesh and richer in his roan. We have seldom seen the favourite cylinder simile so completely typified, and a plumb line rests level on every part of him. He comes to Cullshaw's call like a lamb, and his head is seen in perfection as he lifts it, and bestows upon him the most affectionate of salutes. His dam had held this barn as the post of honour till about a month before, when the frame became absolutely necessary. Royal Butterfly was shown at Chester, but was so unwell with purging as to be obliged to leave the yard. Another fortnight, however, saw him take the head prize at Northallerton, and he is now in rude health, and ready to meet all comers at Warwick.

We should like to have brought back Master Butterfly to the barn from which he marched forth in successive years to Lincoln, Carlisle, and Chelmsford, to vanquish John O'Groat, Grand Turk, and Fifth Duke of Oxford; but the wish was vain, and we could only dwell in memory on that symmetrical form, which knew little or no change, when it was shipped at the East India Docks, from what it was, when he was seen taking his breakfast of rich new milk as a winning calf at Lincoln.

He knew no check to his victories either in England, Ireland, or Paris; and such was his luck, that when disease came among the cattle in the French show-yard, he missed it entirely. Mr. Strafford negotiated his purchase for Mr. Bostock in the Chelmsford Show Yard, and he was taken off to the shippers at once. He went to Mr. Ware, of Geelong, in Australia, and was exhibited soon after his arrival at half-a-crown a-head for the benefit of its Agricultural Society. Nothing could be more docile during his long voyage out, and while the passengers fed him with biscuits, it was quite a diversion among the sailors to see him answer to his name like a dog, and take so very kindly to chewing tobacco. Unhappily, the man who went out in charge of him died, and he has shown some little temper since. The papers very early made him play in the farce of "Twice Killed," and when he rancorously persisted in living, they plunged him into "a very delicate state of health." His former guardian was hard of belief, but really as report followed report, he might have almost been tempted to exclaim to him in an agony across the Pacific, "*Och hone! why did you*

die?" All we know is, that he saw the happy New Year in, and that on the last day of January he was rather low in condition, but in full vigour and spirits; and that out of the eighty-five cows which were put to him in his second season, seventy-nine had already calved. His owner bought several with the B. brand, which, from the immense care Mr. John Bolden—who took over Mussulman, and other choice specimens of the Bates, Booth, Cradock, and Lax blood—bestowed on breeding, has long been synonymous with excellence in the New World. On a muster, two years since, of these B.'s and their progeny, they numbered about nine hundred. All the females, with the exception of one hundred and sixty, were spayed; and these were again reduced by culling one hundred, to the five dozen which Mr. Ware reserved for a cross with his Master Butterfly. The rest of the aforesaid eighty-five were made up by ten from Mr. Ware's brother, and fifteen from Ferry Creek station.

With such Australian gossip we beguiled our walk past the front of the Hall, which lies in a hollow under Saga Bank, to the head-quarters of the herd—about a good bowshot beyond. A Chester prize sow by "Old Joe" was one of the first objects that caught our eye there; and if she or any of her present progeny ever appear at Bakerstreet, with their bill of fare over their heads, we shall enter a protest with the stewards if coals is not one of the items; for more inveterate crunchers of that mineral we can never hope to meet. This yard itself has gradually risen from being an old timber one into its present dignity. Twelve new loose boxes have been built, and others are contemplated, so as to completely encircle it. They are all as comfortable as thought and money can make them. The troughs are let into the wall; the corners are all levelled, and while the ventilation is managed through the door and from above, the draught all comes from below. We began with Butterfly V., out of Butterfly III., who has every appearance of sustaining the family charter, and then Roan Duchess II. marched forth. She gets a strong touch of the Duchess horn, is still as even as a heifer, and displays to perfection that wonderful back which tells of her descent from Kirkleavington. All the Royal and Yorkshire prizes fell to her in succession; and such are her milking qualities, that she gave sixteen quarts after her first calving. So far she has had three calves, and she is in calf again to Royal Butterfly. Her dam, Roan Duchess, out of Red Duchess by Cleveland Lad, was bred by Mr. Wetherell, and was bought at his sale by Mr. Eastwood, in 1850. She was afterwards sold to Kentucky, in calf to Frederick; and the produce, a bull-calf, is named Towneley, and wears a silver ring in his nose as a token of his high lineage.

From her we passed on to Rose of Towneley, by the Squire (a half-brother to Frederick) out of Roseleaf, who goes back to the Barmpton Rose tribe, and was sold to the French Government. They had only one more by him, which found a purchaser in Mr. Thorne, of New York, for 400 guineas—so that Frederick does not seem to have monopolized all the family virtue. Rose of Towneley herself is so level and straight behind, that

she forms a complete parallelogram, thick and compact as needs be, and with rare length from the huggins; but perhaps her handling might be better. Beauty's Butterfly (the Smithfield candidate) stood third, and never did heifer lay it on more level everywhere. She began once as if for calving; but it was a false alarm. There is no superfluity of bosom; but it was delightful to get her foreshortened, and catch the fine sweep of the crops and that half-acre of back. Anon we came to the Chester ten, through whom Booth's Queen of the Isles swept so proudly; and out they came in pairs; beginning with the very gay Frederick's Rosa, and the very thick Venillia's Butterfly, the last of the pledges that Master Butterfly left to his birthplace. Alice Butterfly and Young Barmpton Rose, by "Dick," made a second couplet; and, like the two former, each of them has had a calf. "Dick" was doubly represented, in the next box, by Emma and Pearl; both thick-fleshed and near the ground, and each the dam of a bull-calf. Emma has been put to Royal Butterfly, and she took our fancy more than any up to that point; or even Evadne by Frederick, and Violante by Valiant, out of Roan Duchess. However, we veered round from "Dick" to Frederick, when we caught a sight of his two daughters, Diadem and Fidelity. The latter is very good; but still we always expect to see Diadem keep her pride of place. This beautiful strawberry roan has not that wondrous wealth which enchains the eye in Queen of the Isles; but she wears the exact Towneley type of fine, well-sustained length and substance, with that undeniable back which came in with Frederick. Then we looked at the rather small, but neat Bracelet, a three-year-old heifer by him, out of Pearly, sister to Ringlet (who was bought by Mr. Douglas for 500 guineas at two years old); and near her stood one of the produce of these ten young mothers, to wit, Rose of Lancaster, out of Young Barmpton Rose, and a grand-daughter of Rosemary, who won the first prize at Paris for yearling heifers. The former is the best of the two, and looks like a "Follow-me" sort of lady when show-days come round.

The young bull calf Bowbearer was still being nursed by his dam Frederick's Victoria, who was not three-and-twenty months when he was calved, and the little fellow speaks for himself as to the milking properties of the Frederick blood. He is by Baron Hopewell (by Hopewell out of Baroness, by Baron Warlaby), whom Col. Towneley has bought, as a new cross for the heifers by Master Butterfly out of Frederick's cows. So far they have used him sparingly; but Bowbearer, who has a great deal of the Hopewell about him in the sweet countenance, and slightly upright horns, as well as two other bull calves, out of the Barmpton Rose tribe, furnish every encouragement to proceed.

Anon we adjourned to the Frederick side of the house, and found Field Mate, by him out of Vestris III., full of quality and hair, but rather low in condition. Before her son, Gold Medal by Jasper (half brother to Butterfly), came on to parade, we asked after Victoria, the queen of the dozen wreaths for flesh and figure, and found that she had been slaughtered in November. She

had bone foul in one foot, and displacement of the calf-bred to boot, and Col. Towneley accordingly issued his warrant, and gave her away to his labourers. She had been very much reduced since the Birmingham and Baker-street trips, with a view to her calving, which took place on May 23; but still her fat alone sold for £9. Her first calf was by Frederick; and her second, Gold Medal, has been sold for a long sum to Mr. Atkinson, of Bywell, in Northumberland, who has bought several other specimens of the herd.

We at last reached Frederick, who was the first bull that Col. Towneley ever bred, and like Jasper he was a twin, but neither of the twin sisters bred. Through his progenitors, Duke and Bessy, he unites Mr. Lax's and the Barmpton Rose blood, and by putting him on Butterfly they got a second cross of the latter. Nearly all the principal winners in the herd, Master Butterfly, Roan Duchess II., Blanche VI., Ringlet, Frederica II., &c., are by him, and he can thus boast of more prizes, even in these fierce days of competition, than any bull on record. He was never shown himself, but was used by the Colonel's tenants for three years, and they soon began to see that he had left them something better than their neighbours. Cows never come to any of the bulls, but the Colonel has given no less than twenty-three bull calves for the use of his tenants; and a cow by Gay-lad, with only one cross in her, bore striking testimony, as she strolled about the yard, to the value of such a loan. All applications to hire him or to send cows to him by different parties have been refused, although some of them have been tempting enough. He generally gets them strawberry roan, like himself, and nearly equal in sex; and all the heifers, with two exceptions, have sustained that milking property for which his own dam Bessy was so remarkable. He is now ten years old, and as straight as a line in spite of it. His quarters

are long and neat; but we did not admire his head so much as some do, and thought the outline of it rather too straight, though the eye gives it a very blood-like character.

At present the herd consists of about fifty head, and from twenty-five to thirty calves are bred every year to repair the gaps, which are left by extensive sales. Such is its prolific character, since Mr. Culshaw discovered the philosopher's stone, which enables him to combine fat and fertility, that in one season, when Master Butterfly departed for Mr. Strafford's £1,260 cheque, and the same gentleman also gave 1,000 guineas for three heifers—Butterfly II., Miss Buttercup, and Pearlletto—on behalf of Mr. Thorne—no less than £6,200 worth was sold, and the herd knew no reduction in numbers with the new year.

In 1858 the Emperor of the French was a customer for two cows, a bull, and a bull calf; and this year they have sold four bulls, and let two. Col. Towneley has exhibited ten years at the "Royal," and got his maiden prize at Norwich, as second to Mr. B. Wilson in the yearling heifer class. Since then his seconds and H. C.'s have been legion, and his first Royal prizes have amounted to sixteen, the largest number ever won by one herd in the same time; and that in the teeth of training competition very different to what it was in the quiet old days. Every heifer or cow prize has been claimed, save when Vestris calved a dead calf a month before its time, and thus forfeited her second prize. Cycles of barrenness (we only speak in a prize-winning sense) generally follow those of profusion, and last year his luck came to a check; but if *Gladiolus* be any omen, we shall not have to wait long before we see him "come again" on what has proved such a Field of the Cloth of Gold, and be foremost among the best once more.

TEMPERATURE.

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

A few April nights, with a temperature below the freezing point of water, naturally enough reminds the gardener and the agriculturist of its results on their crops.* The gardener is, perhaps, most affected by its influence, and is therefore more wont to ponder over the injury it inflicts. His domain is tenanted by too many natives of warmer climates than our own, to render him secure from the effects of considerable and rapid transitions in the temperature of the atmosphere. The agriculturist, however, is very materially interested in such transitions: they largely influence,

* The thermometer, which stood at 22 degs. early in the morning of April 1, was not lower than 53° on the night of the 6th; it descended to 28° on that of the 16th; was not lower than 45° on the 23rd, but was at 26° on that of the 22nd.

not only the condition of his live stock, but the prosperity of his crops. Let us see how this kind of knowledge has gradually promoted the profitable growth of one of our great spring crops: the result may prompt us to farther and equally beneficial inquiries. Barley was formerly supposed to be incapable of bearing the low temperature of our winter: it was, in the olden time, invariably a spring-sown crop. Tusser, writing nearly three centuries since, advised his brother-farmers of 1553 "to sow barley in March, April, and May; the later in sand, and the sooner in clay." His reasons, however, for the advice would hardly be satisfactory to a skilful modern farmer. He adds:

"Who soweth his barley too soon, or in rain,
Of oats and of thistles shall have to complain."
A century after Tusser's time, John Worlidge,

in 1669, advised the farmers of his day (*System of Agriculture*), that "Some sow barley in March some in April, others not until May." There are, in fact, many agriculturists now alive, who will remember that, in their boyhood, no one thought of sowing barley until March or April. This dread of exposing barley to a low temperature was a natural conclusion of our forefathers. They well knew it was the native of a warmer climate than ours. It was cultivated, they learnt from the best authority, in Palestine, so early as the year 1491 A.C. (*Exodus ix.* 31). They were aware that the Romans imported it from the shores of Africa and Spain. Barley will not, however, succeed in other than temperate climates. It will grow indeed under the equator, but only at such elevations above the level of the sea as compensate for the effects of latitude: even at 3,000 or 4,000 feet it is there not worth cultivating. Humboldt noted that on the great Himalayan chain it succeeds as high as 14,707 feet, and another variety, called Ooa, even much higher; and in the Tibetan Highlands, wheat succeeds extremely well up to 12,022 feet. The fear of exposing barley to a low temperature has, however, long since ceased. We are all aware that in some districts it has become almost as much a winter crop as wheat, and that the quality of seed produced from early-sown barley is very superior. The Northern farmers, too, have found that the barley grown in the South of England is the best for seed; that so far from the crop it produces being more injured by the cold of our more northern spring nights, it in fact ripens earlier than if the barley ripened in the North is employed for seed.

Owing to barley being capable of maturing its seeds in ninety days, it can be grown as far North as 70 degs.; for, in Lapland, during their short summers the average temperature is greater than during the same periods in portions of Scotland. It will not generally ripen in a lower mean temperature than 56 degs. In our island the height above the sea at which it may be successfully cultivated extends from about 1,000 feet in the South to 800 feet in the Eastern side of Scotland, and to 600 feet on its Western, but not much above the level of the sea in the North. The creeping as it were of the barley fields up the sides of our hills has been steady, but gradual; it is now indeed successfully cultivated in portions of our island at elevations which our forefathers would have deemed impossible.

It is evident indeed that our barley crops are not an exception to the general rule that plants are benefited by being exposed to a lower temperature during the night than that of the day; nay, that such a variation is almost essential to their prosperity. The remark is not confined to our native produc-

tions. The tea plant of China is exposed to, and is at least uninjured by, very severe frosts. The vines of the wine-producing countries bear a similar low temperature with advantage. The most flourishing vineyards of some districts of France are those with a northern aspect. The same remark very commonly applies to our own woods.

There is, then, little doubt but that a periodical lowering of the temperature, by causing *rest* to the plant, promotes its vigour; just as exposure to considerable and long-continued heat by over-exciting, finally deadens the energies and reduces the vigour both of plants and animals.

It is difficult for the farmer to prove these things by an easily-accomplished experiment. Here the gardener possesses a considerable advantage: his trials can be readily made under cover, secure from the many disturbing occurrences of the field. Some very useful experiments in this way have recently been recorded by Dr. Lindley (*Gardener's Chronicle*, 1859, p. 312): they were made in the Chiswick Garden of the Horticultural Society. Certain plants were placed for several weeks in a stove with a high night-temperature, supposed to average 69 degs. Their rate of growth both by day and night was carefully recorded. The results were as follows, the lengths attained by the plants being given in inches:

	By Night.	By Day.
Fig	9'60	9'92
Willow	19'08	21'55
Passion flower..	36'20	35'85
Vine.....	34'15	34'45
	99'03	101'77

So that in high temperature they grew as fast by night as in the day. But when these and other plants were grown in the open air exposed to our low night-temperature, the results obtained were very different. This is clearly enough shown in the following table of their growth:

	By Night.	By Day.
Fig	1'63	6'80
Willow	3'77	9'94
Hop.....	42'02	100'53
Vine.....	2'34	4'20
Scarlet runner..	23'11	97'72
Jerusalem arti- choke	8'23	22'25
Gourd	21'23	48'05
	102'33	289'49

This experiment was repeated with similar results. Thus we see, as Dr. Lindley adds, that plants exposed to natural circumstances only made one inch of growth by night, while they made three by day; but that, on the contrary, under bad artificial treatment they grew equally day and night. If, indeed, we consider a little what the natural habits of

plants really are, we find that, like animal, they *must* have their constant periods of repose. Winter to them is an annual night, as to ourselves is a period of daily rest. We cannot with impunity break in upon these natural habits. When we attempt it, we see vines yielding watery wood and colourless fruit; cucumbers emaciated and barren. "We have shown," remarks a practical gardener, Mr. W. P. Ayres, in his work on the cucumber, "that the cucumber will sustain no injury at a temperature of 55 degs. during the night, and we are certain the plants will be more vigorous and continue longer in a bearing state in a low than if a high night-temperature was maintained."

Similar observations to these were long since made by T. A. Knight, the celebrated President of the Horticultural Society. These indeed were the kind of researches in which Knight showed himself so much in advance of the commonly entertained notions of his day.

He told the fellows of the Horticultural Society, when addressing them "on the ill effects of excessive heat in forcing-houses during the night,"—"Being fully sensible of the comforts of a warm bed on a cold night, and of fresh air on a hot day, the gardener generally treats his plants as he would wish to be treated himself: and consequently, though the aggregate temperature of his house be nearly what it ought to be, its temperature during the night, relatively to that of the day, is always too high. The consequences of this excess of heat during the night are, I have reason to believe, in all cases highly injurious to the fruit trees of temperate climates, and not at all beneficial to those of tropical climates, for the temperature of these is, in many instances, low during the night. In Jamaica, and other mountainous islands of the West Indies, the air upon the mountains becomes, soon after sunset, chilled and condensed, and, in consequence of its superior gravity, descends, and displaces the warm air of the valleys. Yet the sugar-canes are so far from being injured by this sudden decrease of temperature, that the sugars of Jamaica take a higher price in the market than those of the less elevated islands, of which the temperature of the day and night is subject to much less variation."

The effect of temperature on vegetation has also engaged the attention of several continental philosophers. Humboldt has many interesting notices of this kind dispersed through his valuable works. De Candolle had watched the influence of temperature in promoting or retarding the growth of indigenous plants. He had traced their presence from the sea-shore to considerable elevations, from high to lower mean temperatures. He too, in common with the English farmers, was well aware of the

effect of elevation in compensating for latitude in the growth of vegetables. He remarked that when plants, not suited by their nature to support an excess of either heat or cold, are found to grow in different latitudes, it is always at such heights as that the effect of elevation compensates that of the latitude. The *Saxifraga greenlandica* he found growing on the summit of the Pyrenees, at an elevation of from 2,500 to 3,278 yards above the sea. The Spanish chestnut, which only grows on the low lands of the north, flourishes on the hills of the south of France, and at still greater elevations on the Appennines and on Mount Etna.

Cultivated plants are under a like influence as to elevation. They can only be successfully grown at such heights as correspond in temperature to that of the district to which they belong. As a general rule, it may be, perhaps, considered that a degree of latitude affects the mean temperature nearly in the same proportion as 180 or 200 yards in the elevation. This rule is, however, modified by various local circumstances. De Candolle tested, by this rule, the growth of some of the cultivated crops of the French farmers. He found that the highest spot at which maize (or Indian corn) is grown in France, is at the village Lescan, in the department of the Pyrenees, at an elevation of about 1,000 yards above the sea. Now, if we take our departure from that point, which is the forty-third degree of latitude, and proceed five degrees upon the same meridian line, we come to the neighbourhood of Mans, and to the south of the departments of Ille and Vilaine, which are precisely the northernmost points where maize is used for a crop.

The vines of Vela are perhaps the highest vineyards in France; the elevation of the town of Pay is computed at 632 yards, and the vineyards that belong to it go up to about 800. Now, if setting out from that point, which is a little beyond forty-five degrees of latitude, you take four degrees to the north upon the same meridian, you come to between Rheims and Epernay; that is to say, very close upon the northernmost limit at which the vine forms a branch of husbandry. With regard to the olive tree, the local peculiarities of the countries where it grows are such as to make investigations of this kind very intricate: it is generally cultivated in parts protected on the north by some vast range of mountains, where the mean temperature is consequently higher than it would otherwise be. When it is not sheltered by any range of mountains, the northernmost point in Europe at which we find the olive is Ancona, in 43° 37' of latitude. In respect to the other points of view, its positions have been measured in several parts of Roussillon, Languedoc, Provence, and Italy; and

these have been always nearly at an elevation of 400 yards above the level of the sea; which ought to indicate that the olive might grow two degrees more to the north of Ancona. Now, if we take two degrees towards the north from that point on the same meridian, we come to about Lake de Harde and the neighbourhood of Como, which are just the northernmost points at which the olive is cultivated. The fig-tree, which goes farther to the north than the olive, and not so far as the vine, preserves a corresponding gradation in regard to the elevations at which it will grow; but we can hardly determine any precise limit for a tree over which aspect has more power than the degree of positive heat. The same may be observed in regard to the walnut-tree, which reaches a little higher, both in latitude and elevation above the sea, than the vine.

We can hardly avoid, then, the conclusion that there is something considerable yet to be accomplished, with regard to the examination of the effects of temperature upon our field crops. The power of plants to withstand wide ranges of temperature is certainly more considerable than we

are apt to believe; and this power, there is reason to conclude, may be materially aided by artificial means. For instance, the Brassica tribe, in common with other plants, growing on *salted* ground, become frozen much less readily than on the adjoining soil to which salt has not been applied; and it has been remarked in Scotland that salt has the effect of hastening the ripening of wheat. It was in his essay on the Climate of the British Isles in its effect on cultivation, that Mr. B. Simpson had occasion to remark (*Jour. Royal Ag. Soc.*, vol. ii. p. 652), that where it is necessary to grow wheat toward the limit of its growth, either in elevation or latitude, salt should always be used as part of the manure. "This," he adds, "my father has proved, during a long course of years, to cause it to ripen on an average fully a week before wheat, in the manure for which salt had formed no part." These facts are surely worthy of a more extended examination; and other cheap saline dressings might, perhaps, either with or without the admixture of common salt, have still more value in aiding our crops to withstand the effects of our ever-varying temperature.

SPRING RESORTS OF PRUDENT FARMERS.

It is at this precise season of the year that considerable anxiety and no little real difficulty arises as to the disposition of the winter stock, till "Doctor Green" is ready to take charge of them. The turnips for the most part are done; the mangolds are wasting a pace, and as everything is now supplied with them, they cannot last very long; besides, some must be kept for the large stock of pigs now abounding on every farm: these must be moved from the land; it must be cleared. The barley and oats, &c., must be sown, and the earlier these are got in the better; so that every prudent farmer is watchful to have a good resort of some kind at this period, so that his sheep stock shall not suffer any privation or inconvenience, but be kept on ever thriving and prospering.

What, then, are his chief resorts? The farmer on the customary rotations, known as the four or five course shift, will have his grass seeds laid in, or reserved for this emergency. These, with a moderate portion of linseed-cake, will suffice for three or four weeks, and if eked out by an occasional supply of swedes or mangolds thrown upon them, they will not only last the longer, but the transition to the stock from one kind of food to the other—from turnips to grass—will not be sensibly felt. This, generally speaking, is the great resort for this order of husbandry, and makes such farms nearly equal in pleasant occupation and ready efficiency to farms having a large breadth of natural grass pasturage. On these latter farms these grass pastures are usually laid in for the like purposes, and with the like beneficial

results. We know of no better or more profitable appropriation of either grass seeds or grass land than this, at this season; in fact, it is the best possible course for the flock itself, which is thereby led on almost imperceptibly into the green pastures and the nutritive summer food without noticeable effect. Who amongst us has not had to deplore occasionally, when all our prudent contrivances and well-meant reserves have been totally frustrated by untoward seasons—I say who amongst us has not had to deplore the loss of sheep stock from causes over which we could exercise but little or no control? Perhaps we have been compelled to stint them in their allowance of very indifferent food; the consequence, a falling off in condition and impaired health. Anon, a flush of grass or flourishing grass-seeds succeeds; the animals are weak, scouring supervenes, and much loss too often is the result. To prevent this, a free supply of linseed-cake and corn, with such attractive dry food as they could be induced to feed upon, should be given; and, after all, should this prove ineffectual, it is to no purpose to persist: some change must be sought for, however difficult of attainment. The weakest might be selected and placed on dry food for a day or two, or sent to weed the bean crop or the fallow lands—any course rather than continue them on over-luxuriant pasturage.

But there are various minor resorts which prudent farmers provide for the particular time. A plot of rye will be found on one farm, a few acres of winter tares will be found on another, a plot of lucerne on another,

or a plot of sainfoin or of chicory; nay, on many farms in some districts we find large breadths of rye, or of tares, or of sainfoin respectively, which occupy the precise relative position of the grass and grass-seeds as above. These are truly prudential provisions: no farmer ought to rest content without adopting some one or more of them. The rye is of quick and early growth, ready to take the first fall of lambs, and provide good milk for the ewe flock; it is also very productive, and will depasture a large amount of stock, upon which they will thrive well; and as it is generally sown on land intended for a fallow, it can be eaten off in full time for readily adopting that course, and generally good crops of common turnips are produced after this system. Winter tares "are common course of husbandry" in many clay districts, and also occupy a similar position as a reserve for early spring food, and with great and good effect; and the feeding is continued during the greater part of the summer, or till the land is required for the purpose of breaking up for the late summer and autumn fallow for wheat. These crops carry abundant flocks of sheep, which do well upon them, and prepare it admirably for the future wheat crop. The lucerne and chicory crops are of more confined application; neither will admit of depasturage, but must be mown and carried to the stock. In this way they will sustain a very large amount of stock of all kinds; and both are early-growing plants, and well worth culture for early spring food. For horses they constitute a very desirable early and lasting food, as they may be mown repeatedly during the summer and autumn; and one good characteristic is that, when a plant is once obtained, its renewal need not occur in less than from five to seven years. Sainfoin is of similar character—an abiding plant of great value in light lands of chalk and gravelly character, but not of much value in clay and sandy districts. In the former districts it takes the place of the seed crops generally, and with equal benefit; carrying a large amount of sheep stock, and more so when profusely manured by the spreading of straw and the consumption of turnips upon it, which is often the practice. Trefoils, white clovers, and Italian ryegrass are also much approved for these reserves, on suitable soils—the former for light chalks, gravels, and sandy soils; the latter for

all soils of a loamy character—and yields abundantly. It is a matter of necessary acquisition in every farmer's business to have some such reserve, or otherwise he is compelled to take the market, and generally at a great sacrifice. It is seldom that the grazier is prepared to lay in his summer stock before the grass is sufficiently forward to take it; and then he will buy very cautiously, and at a cheap rate, if at all. Dealers and speculators frequently buy up spring keeping to take this very advantage; it enables them to hold a large quantity of stock, to be put into the market at the most desirable part of the season. Farmers and breeders should not be driven to these shifts. Their business should be to estimate closely the number of stock of each kind they can conveniently winter without resort to the preserves reserved for an inclement winter or untoward spring.

I have particularly pointed out reserves of grass seeds, &c.; but, after all, the farmer's chief dependence must be upon his winter-food, and some of that he must retain for these times. Corn, cake, hay, and straw, are all good helps; but it is to the root crop that he must look for his chief dependence. That invaluable root, the mangel-wurzel, is just adapted for this purpose, and when properly harvested it will keep better than any other root; and unlike most others, it improves in value up to the month of May. It will grow also upon any well-cultivated soil, and with artificial aid (and nothing better than superphosphate) produce good crops. This root is my chief resort; in fact, I should not now know how to do without it. It constitutes the mainstay of my farm stock for many weeks in the spring; and I keep a good reserve for pigs, &c., up to Midsummer. Its great constituent, *water*, is now its great preservative; whereas carrots, turnips, &c., having less water in their composition, soon heat and rot, or become tainted food. My practice is to eke out my pasturage of all kinds by leading daily a portion of "mangolds" into each field, and throw them down for the stock to consume as they please. All kinds of stock will eat them, even if grass abounds; and they will improve faster with a supply than without, which proves their nutritive value at this season. I trust more will be grown this year than heretofore, large as the breadth is.

THE STEAM-PLOUGH ON THE FLEMISH FARM OF THE PRINCE CONSORT.

Having been invited by Mr. Fowler to be present at the working of his steam-plough on the Flemish farm of His Royal Highness Prince Albert at Windsor, we went thither on the 29th of last month. Upon arrival, we found the plough working under a disadvantage, the land being a stiff clay, very rough, lying on the slope of a rising ground, and having previously been stirred with the grubber, so that altogether it was impossible to make clean and slightly work. The land was also being manured with farm-yard dung before the plough, which was thereby greatly impeded by the lumps choking the

shares, rendering frequent stoppages necessary to clear it away. In other respects, the machine worked with great ease and regularity, finishing off the "*skewlings*"* in a workmanlike manner. This, we conceive, is the most difficult part of the work for a steam-plough; but we saw several such corners that were finished as well as could have been done by the common plough. The

* This is a provincial (Norfolk) term derived from the word *skew*, oblique, and indicates those angular or irregular portions of a field remaining after the square has been ploughed.

rest of the field, which was more level, had been already ploughed to the depth of from six to eight inches, and exhibited a very clean and regular furrow slice. A small portion of it had been subsoiled, with Cotgreave's plough, to the depth of twelve inches; but the steward, Mr. Bremner, did not consider it desirable to bring so much of the cold subsoil to the surface so late in the spring, the land being intended for mangel wurzel or swedes—we could not learn which. There were three ploughs attached to the machine, and Mr. Greig, the superintendent in the absence of Mr. Fowler, estimated the quantity of land turned over by them per day of ten hours, at eight acres, which, on such a soil, may be considered equal to the work of ten pairs of horses and the common ploughs. The cost is 8s. per acre.

The grubber was at work at the same time, and performed its part exceedingly well. It had five tines, and went to the depth of twelve inches, bringing to the surface the couch grass and other weeds. This operation, we think, ought to have been performed long enough (instead of immediately) before the ploughing, to allow of these being collected and burned, instead of being turned in again by the plough. A part of the field was left unfinished, we presume to be so cleaned before being finally ploughed.

We went over two other fields that had recently been ploughed by the same machine, each of which exhibited a clean and regular furrow slice; nor did we perceive in them any breaks, or returned portions of the land. The whole ploughing is necessarily "on the flat," without any intervening furrows; and whether it can be considered that these ventilators of the corn field are compensated for by the land saved, remains to be seen.

The recent alterations made by the patentee in the apparatus have greatly facilitated the working. The direct application of the power to the ploughs, by which

the length of the working rope, and consequently the danger of breakage, are so much reduced, is a manifest improvement upon the original plan, in which the rope embraced the whole area of the field, or that portion of it taken at one working.

With regard to the economic part of the question of steam-ploughing as at present practised, we consider the direct saving of expense, as between it and the common plough, unimportant; and were there no other source of profit, we should say that it would not be sufficiently great to render it desirable to substitute it for horse-power, or to disturb for it the present arrangements of the farm. The great advantage is to be found in the economy of time, and the rapidity with which the work can be performed; and still more in the increased production consequent on deep culture and timely sowing, both of which may be secured by it. The system, however, is yet in its infancy, and does but just demonstrate the practicability of applying the power of steam to the cultivation of the soil. We look for a much greater development of it, thus applied, approaching nearer to that it has attained in other great departments of industry; and its economic properties must be more fully worked out before the general body of agriculturists will be induced to adopt so important a change in their mode of conducting their business. *Steam must reign alone*, if at all, and cannot, with advantage, be associated with animal or manual power, except as subordinate agents, of which, when it has attained its maturity of growth, it will require only homoeopathic doses. Our machinists will do well to consider this, and to direct their attention to an extended application of steam-power to all the operations of husbandry, which alone can render it a truly economic agent, and to which we assuredly believe it is destined ultimately to attain.

THE IMPLEMENT JUDGES AT CHESTER, AND THEIR AWARD ON THE PORTABLE THRASHING MACHINES.

SIR,—On account of many remarks made, I venture to trouble you with the following, as I wish to be set right with the public, having acted for some years as a judge for the Royal Agricultural Society, and hoping that what I have done has been for the mutual benefit of all classes belonging to it. I cannot, then, allow bad motives to be imputed to me, without speaking.

“CLASS IX.—FOR THE BEST PORTABLE COMBINED THRASHING MACHINE, THAT WILL BEST PREPARE THE CORN FOR MARKET.”

On carefully examining the Judges' Report of the Chester trials of the above-named machines, I cannot understand the decisions arrived at. I fear I am very stupid; but I will take the judges' figures on the points of perfection, and the headings used for some time by

previous judges, and which fully report on the points most worthy of consideration.

OLD STYLE, AS UNDER.

	Clean thrashed.	Clean shaken.	Cavins free from Corn.	Chaff free from Corn.	Corn unbroken.	Straw unbroken.	Total.
	100	70	70	50	50	20	
Clayton & Co.—							
Wheat	90	63	49	45	45	20	
Barley	80	56	76	40	45	..	
	170	119	105	85	99	20	539
Hornsby—							
Wheat	90	63	63	50	45	..	
Barley	90	63	63	40	40	..	
	180	126	126	90	85	..	617

It is thus shown that, on these points, Hornsby is a clear winner by 38 points; while in the Judges' Report, with their new and additional points, they put Clayton

& Co.'s machine 19 points only over Hornsby. And how are those points gained? Why, by making Clayton & Co.'s *clean dressing* 21 points over Hornsby; while at the same time, in the dressing of wheat and barley, Clayton & Co. are 14 points below the standard of excellence, proving that their machine was not perfect—only better than Hornsby's.

And how, may I ask, were those points gained (viz., for clean dressing)? Why, because Messrs. Clayton did not thrash so clean as Hornsby by 10 points; his shaking was not so good by 7 points; and with cavings free from corn, Hornsby was 21 points ahead. Hornsby was 5 points the better on chaff free from corn. In the injury of corn, on wheat, they are equal; on barley, Hornsby loses 5 points: but, remember, he thrashed it cleaner than Clayton by 10 points; consequently, there was more chance of breakage. But for the finish: 100 stands for excellency of workmanship, which is given to Hornsby, while Messrs. Clayton are 18 below that standard.

Hornsby clearly loses on account of power required; and why was it required? Because he thrashed cleaner by 10 points; and those 10 points were on the barley trial: but both were under the number denoting excellence. Hornsby's shaking was cleaner by 7 points, and those points were the cleaner shaking of the barley; his *CAVINGS* were cleaner by *TWENTY-ONE POINTS*; and his chaff by five points: on which account, his riddles had more work to do, and the whole machine had to carry the weight of nearly all the corn put into it into the sacks, which Messrs. Clayton did not do; and thus, the cleaner dressing of Messrs. Clayton's machine, but, remember, not fit for market, but better than Hornsby's—evidently proving that all the corn had to be again dressed for market. And then Hornsby wins, as his cavings and chaff were cleaner by *TWENTY-SIX POINTS*, and would require less riddling, one parcel of chaff being free from corn.

But I now go further, and say the judges could not lawfully give Hornsby the prize. The power he required exceeded 8 horse power. But on this rule they do not act, but sum up all their points in page 336 of the *Journal*, and say:

"Consequently, we awarded the prize of 15 sovereigns to Messrs. Clayton & Co."

As they totally overlooked the rule for the prize, I say they gave a wrong decision on their points, if points—and, mind, improved points—are to be the true standards of excellence; and by their own figures they show that the extra power which destroys Hornsby on their points, was caused by the superiority of the work done. The horse-power for barley is not given, but on the wheat is, for Clayton & Co. 5.34, and for Hornsby 8.38.

After all these figures and summing-up in page 333 of the *Journal*, we read, at the end of the table of Class IX., the following remarks on Messrs. Clayton's machine:

"Everything worked in *harmony*—worked *remarkably steady*. Slides slipped, causing the riddles to choke. In barley-dressing the riddle altered too fast for the hopper."

Who has ever read such remarks? "Everything in harmony!" I suppose, harmonious concord of three-parts of the machine going wrong.

All machines that have previously choked have been turned aside.

As *one* judge is annoyed by remarks made on one bad point in a machine, I have written the above to show that I was right in my opinion on that point—an opinion given after the machines had returned to their stands for at least an hour, and after the trials of four selected machines for second trials (which trials are not given account of, and in which Messrs. Clayton's machine did not choke); and when I was quite at liberty to say, on being asked privately, "What do you think of this work?" (meaning the cavings, and which I had seen before), I answered, "I should not like to give a prize for such one part of work; but, not knowing all the other points, I cannot, of course, say which is the best machine." But it was on that point that Hornsby won by 21.

I write with no rancour. I only wish to put myself right, after unfair and uncalled-for remarks, publicly expressed; and it has gone forth that I (steward-elect of the Society last year, and now a steward), with Mr. Hornsby, interrupted the judges. And how? Merely because, in private conversation, I made a remark, which Mr. Hornsby repeated to a judge; and, as I have said before, after the trials had been concluded for at least an hour, the machines gone to their stands, and *no judges near us*.

Having been a judge myself, and, I hope, not a useless one, and having had many remarks made to me by disappointed exhibitors, still, I believe, not one of those exhibitors would refuse again having their implements tested by me. If the judge had spoken to the stewards at once, all could have been set right, and ill feelings have been done away. If Mr. Shackell had named to me what had passed (for I sat next him at the dinner, and he knows what I did there for him), all ill feelings (if he had them then, which I doubt) would have been allayed. And I am sure we parted as friends, and as men mutually endeavouring to promote the interests of the Royal Agricultural Society of England.

To conclude, I am a friend to all parties who are endeavouring to bring forward good implements. I have tampered with no one, and am sorry that an ill feeling has arisen, and that a judge should come forward and make such remarks as Mr. Shackell has thought proper to do. It is the first ill feeling brought forward during the Society's duration of 20 years; and it passes my comprehension.

I will now sum up as follows, and say—If Mr. Shackell was interrupted, why did he not appeal to the stewards? and why delay his complaints until March last past? I will say no more, but that "Practice with science" is a good motto—understood in words, but not carried out by all.

I am, Sir, yours truly,

H. B. CALDWELL.

Lackham House, Chippenham, Wilts,
April 18th

"THE BEECHEN TREE."

SIR,—There are few things of more importance to horticulture and agriculture than hedges and fences; besides their services as dividing property, they act as a shelter to all crops which they enclose. In short, we must all have fences of some kind or other, for the vineyard mentioned in holy writ, that was to have "the hedge thereof broken down," gives unquestionably the idea of utter ruin to that very desirable piece of property.

Common sense, in these days of "express speed," and intelligence transmitted at the rate that the lightning travels, is of very little avail; and in our haste to cultivate the unemployed moor and unprofitable waste, we shall certainly have to hedge in, in hot haste, as a preliminary to all further improvement.

The quickset hedge of honest hawthorn has long held sway in this department, and has every chance of being a troublesome tenant to get rid of; and it will be no easy task to get up a case against such a plant, seeing it has done such service to the trade.

The size of an unpruned thorn tree, full grown, may be taken at one-tenth of the size of the beech tree, where the latter finds a favourable soil. The thorn is decidedly a slow-growing plant, becoming eventually a stunted-looking small tree, coming into leaf early, and remaining in full foliage till late in the autumn; these are its chief characteristics. But its strength lies in its prickles; and were it not for this armour, it would doubtless have passed into the same disrepute in agriculture that its confere the thistle has done.

Deciduous trees like the thorn are always objectionable as hedge plants, since their sheltering properties are always least just at the time when their services are most needed; and if we could get holly trees to grow quickly, they would set the matter quite at rest as to what plants we should make our hedges of.

The yew, were it not poisonous to cattle, would be an equally great boon to the farmer as a hedge plant; but with all its beauty it is but of slow growth, and for 100 years or more is but a small tree. The thorn, the holly, and the yew are all costly if planted when they are over three feet in height; consequently they are planted very young; and two rows of posts and rails, chartered for the occasion, have to take charge of their childhood, and a good supply of manure to their roots adds no small item of expense to their culture. It is far otherwise with the "beechen tree." It can be planted full-size at once for a hedge; for you can purchase at most nurseries beech plants five or six feet high, and that at a very moderate price considering the importance of the plant when got of the proper hedge size. I have seen a tall beech hedge planted in two rows, one line sloping to the east at an angle of 45 degrees, and the other to the west, and both tied here and there to keep them close. This hedge was full grown

the day it was planted; and twenty years afterwards, when I saw it last, it was a fine beech hedge, forming a beautiful object, a substantial fence, and an excellent shelter both in summer and winter; for the old adage is, that the beech is the wisest tree, for keeping its old coat till it sees how the new one suits it. In this respect it is quite an exception to deciduous trees, which, when in good health, drop their leaves one and all when ripe, and the footstalk shows a clean scar, as if the separation of this organ from the tree had little to do with winter's cold, but obeyed a law that gave it leave to go in peace when it had perfected its labours.

The beech tree, therefore, recommends itself to us on the score of economy as well as on that of speed; for it is cheap in the first instance, and requires no paling to make it a fence; thereby lessening the outlay, and acting immediately as a hedge, it allows cultivation to proceed under its protection. But the great advantage of beech hedges is that they can give shelter to any desirable height, and still can be kept at the height of a man if preferred. Their yellowish-brown colour in winter is decidedly pleasing; and I have seen some beautiful shapes clipped in single plants, standing above the hedge, as stars, globes, pyramids, and the like. And where beech hedges are used as shelter to a nice farmhouse, or villa residence, a little taste on the part of the owner or occupier in this way is certainly praiseworthy: where a thing is useful and essentially necessary it may with good reason be respected, and even made ornamental.

Mr. Rivers, of Sawbridgeworth, had a beech hedge as a back to one of his orchard-houses; and in this way he imitated the climate of the south of France, and produced the fruits of such a climate successfully without fire heat, simply by a glass roof and boarded ends and front. To invalids such a house would be a very great luxury.

To horticulture and agriculture high hedges, with proportionate enclosures of land, so as to secure shelter without the overshadowing which unpruned trees always give, would warm the climate by many degrees; and thus give early crops, and half-house the live stock in foul or cold weather.

I would gladly have given the prices at which I have been purchasing beech plants; but this is not an advertisement, and I have no interest whatever in selling any man's goods; but it is really very provoking to see people planting, at great cost, a string of tiny thorn plants, and waiting patiently for years till they grow into a hedge-row, when they might have a full-grown, strong beechen hedge at once, for the same money as the plants, pales, and manure represent.

ALEX. FORSYTH.

13, Islington-square, Salford,
Manchester, Feb. 19, 1859.

THE PROGRESS OF AGRICULTURE AND THE COUNTRY MEMBERS.

The chairman of the Central Club must have felt himself in rather a difficult position when the members met to consider "The Progress of Agriculture"—certainly as open-handed a thesis as the wildest of talkers could have wished to address himself to. As a natural consequence of such liberty of action, every man rode his own favourite hobby, and the progress of agriculture came, in turn, to depend upon thrashing corn by the flail—the application of town-sewage—the selling by weight instead of measure—the diseases of the turnip crop—and the pedigrees of English gentlemen. In fact, the magnitude of the question was generally too much for the meeting, and the discussion we fear will read as one of the least edifying the society has yet commanded.

Fortunately, the introducer of the subject came better prepared. Mr. Robert Smith's opening paper is indeed remarkably comprehensive, touching as it does on almost everything that has at any time tended to the development of the art. He is content not merely with a retrospective view of how agriculture has fared in our own country, but brings Cato, Varro, and Virgil alongside of Bakewell, Ellman, and Francis Duke of Bedford, as the best of all good company. As a review of what has been gradually accomplished, Mr. Smith has supplied the Club with a very interesting address. We are ourselves, however, inclined to regard the present progress of agriculture as a question rather of prospective than of retrospective consideration. We look, indeed, on the *general* advancement of the art as of comparatively very recent date. Such men as those referred to in Mr. Smith's paper, especially those living towards the close of the last or the commencement of the present century, no doubt did much towards putting English agriculture on an improved footing. They supplied us, as it were, with the fundamental principles of the pursuit; but it was not until long after that these came to be commonly taken up. The establishment of the Royal Agricultural Society was determined on at a very happy time; and from this we may fairly date the real progression of the business. The one great secret of this has been the increased facilities of communication and transit—in a word the use of steam. Without railway accommodation, the English Society, like the Board of Agriculture, might have fallen through. It undoubtedly could never have made such meetings it has now year after year continued to climax. The very Farmers' Club, but for this powerful ally, would have had no monthly *réunions*. The farmers would have heard the news and kept to the ways of their own parish; while a few wealthy amateurs might have still amused themselves with experiments, that few others would understand, and fewer still attempt.

In thoroughly coming over the lesson thus brought

by post and parcel home to his door, it was perhaps as well to leave the man a little to himself, and see what he could make of it. Now there is no possible question but that during the twenty years' cycle in which we have been achieving such decisive progress, agriculture and agriculturists have been left very much to themselves. It has become rather a pride and boast to say the Legislature, or the Government, does nothing for us. In fact, no man enjoys so thorough a seigneur as the honourable gentleman who represents the agricultural interest. There is really nothing now for him to do. We accept the price of wheat at whatever it may happen to be, and go on refining our shorthorns and amending our steam-ploughs without any necessity for formal protection or encouragement. Notwithstanding this, we are inclined to think that the further progress of farming may be greatly facilitated by a little more attention in high places. Let us take Mr. Smith's own catalogue of public questions, that call for consideration and adjustment:—The weights and measures by which agricultural produce is sold; the establishment of a better system of taking the corn averages; a re-consideration of the malt tax; agricultural statistics; the adjustment of the game laws, so as to substitute "winged game" for the four-footed trespassers; a better understanding of the law of customs and covenants, as regards the quitting of a farm; an extension of the Government draining loan; and lastly, the preparation of a new and complete Ordnance map, upon a large and comprehensive scale, under the direction of the Government.

Now what is likely to come of all or any of these at the rate which we have lately been going? Does the honourable member for the agricultural interest take a really active part in forwarding any of them? The merchants, and especially the farmers, have for the last year or two been declaring more emphatically than ever that they require some uniformity of system for the sale of corn. The honourable member for the agricultural interest does not trouble himself in the least about such a matter. Most probably he will take care not to be present when such a question comes on. Or, the corn averages should really be more carefully taken. The honourable member's friends, the farmers, have been telling him so almost ever since he has been in the House. But he keeps their secret wonderfully well, and never mentions a word of it to any one else. He has even struck the malt-tax paragraph out of his address; and as to the game laws, farm covenants, or Ordnance maps, he must be a very sanguine rural elector indeed, who expects his representative ever to say anything about such things as these. As a rule, in fact, it is all the other way. It is rather low to talk too much about your own business, and the county member never talks about it at all. Mr. Caird may have something to impress about the price of guano;

Mr. M'Cann, if he likes, may take up the Weights and Measures' movement; and Mr. Bright may declaim against the injustice of the Game Laws. The honourable member for the agricultural interest is perfectly indifferent to what they may say. What is the price of manures, the sale of corn, or the damage done by rabbits and hares to him or his constituents?

It would certainly seem to be little or nothing. But is this quite fair? What can be the use of farmers continually meeting and considering points they desire to have adjusted, if no attention is paid to them by those whose first duty it is to see their supporters righted? The progress of agriculture will come in many ways to something like a dead lock, until the agriculturists themselves are a little more demonstratively represented. The Royal Agricultural Society may do its work, and the Central Farmers' Club its share of it; but to do any good the work must not stop here. There are many matters more than ripe for a settlement. The most energetic even gradually tire of considering them; and it is simply a point now as to who should go on with them. We say unhesitatingly that the members for rural districts should evince far more readiness to do so than they latterly have done. Only let a

townsman have a grievance, and mark how anxious his honourable friend is to help him out of it. Unfortunately we do not meet with so many volunteers.

Would it be impertinent or out of place to put a few such home questions as those we have referred to at this election? Depend upon it, the farmers have worked and will work comparatively in vain, unless they can bring their efforts a little more to a focus. Do not let them be too delicate or indifferent as to impressing the wants of their own order just where and when they may do so with some effect. The interests of landlord and tenant are in the main identical; and there is not a subject we have here touched on but either of them may go fairly into. A farmer of long experience and much authority, as well as being the agent of a county member, assures us these matters must be looked to and amended, or we shall have no proper agricultural progress. What Mr. Smith said at the club, those who hear or read him aright may say at the hustings. If the farmers do not care to go into Parliament, at least let them find somebody who will say a word now and then for them. There are three or four important points that have now only to be pushed in the House. Let our care be to push only a good man up to the door.

LONDON, OR CENTRAL FARMERS' CLUB.

THE PROGRESS OF AGRICULTURE.

The usual Monthly Meeting of the Members took place on Monday evening, April 4, at the Club-house, Blackfriars.

Mr. Thomas, of Bletsoe, was in the chair, supported by Messrs. W. Bennett, C. T. James, H. Trothewy, Robert Smith, S. Skelton, James Thomas, G. Wilsheer, J. B. Spearing, T. E. Pawlett, J. Tyler, E. Little, James Wood, J. G. King, J. Howard, B. P. Shearer, F. Dyball, C. J. Brickwell, L. A. Coussmaker, J. Cressingham, J. Wood (Croydon), M. Reynolds, Norman Taylor, W. Cheffins, H. Shotter, E. B. Acton, J. Parkinson, W. Eye, G. Whistler, D. Christie, R. Palgrave, G. Russell, P. F. Pell, E. B. Waite, E. Tattersall, S. Sidney, J. M. Lansdell, &c., &c.

The subject for discussion—"The Progress of Agriculture," was introduced by Mr. R. Smith, of Emmett's Grange, South Molton, Devon.

After a few introductory remarks from the Chairman,

Mr. SMITH said: Gentlemen,—When we speak of "the progress of agriculture," I feel that every link in the chain of agricultural events forms a theme in itself, alike expressive of the progress which the "art," the "manufacture," and the "commerce" of agriculture have made during many past centuries, and down to the present time. Indeed, the subject grows upon me, when I reflect that our island was once a "common waste," and that the industry of man has redeemed it from century to century as population increased. Thus agriculture has been fostered from the earliest dates, and we live in a century in which the art has made a degree of progress hitherto unprecedented. Within the last few years, this

subject has been treated by the late Philip Pusey, to whom English agriculture stands much indebted, in a paper in which he reviewed a period of eight years preceding the year 1850. Mr. Wren Hoskyns has given us a most valuable "Retrospect of English Agriculture during the fifteen years preceding 1856," before the Society of Arts. In April, 1858, a third paper appeared, written by a member of this Club, of which paper I will only say that it is fully worthy of its author. Such records having preceded the introduction of this evening's discussion, I find it no easy task to bring before you a subject which shall be clothed in novelties or embrace new matter. But I have one advantage on my side, namely, the full benefit of your fortified minds to aid me in discussion, and thus simplify my mission to that of introducing the subject to your notice. With a view to varying my subject, and marking the interesting progress that has been made from time to time, I will take as a starting point a brief glance at our early history.—The progress of British agriculture has long been a leading subject in the history of our island, and has been dilated upon alike by the historian, the politician, and the poet. It is common ground for every citizen; it is a nation's question, involving the supply of food for an increasing population upon a given space of land—an island. Indeed, the first want of man is food, and his natural resource for it must be the ground. Hence the tillers of the soil share no small responsibility in the general weal of our national progress. Agriculture is the parent of manufactures and commerce; hence it is not only the most

useful of arts, but that which requires the greatest number of operators. The early invention of tillage would be coeval with the discovery of the uses of the cereal grasses, and may thus be considered as the grand step in the invention of ancient husbandry, and the most important as leading to the establishment of property in territorial surface. The early practice of agriculture was confined to men of humble station, who pursued it as a matter of business for daily livelihood. In the last century the occupation became more extended, and it has been engaged in by men of rank and capital, together with some other amateur practitioners, as a matter of taste and recreation. — It is both curious and interesting to refer to some early writers upon agricultural affairs, who, be it remembered, lived in the days of seclusion; but nevertheless they had their wits about them. In the time of the Romans, we find Cato recommending a farm and situation “where there are plenty of artificers and good water; which has a fortified town in its neighbourhood; is near to the sea, or a navigable river, or where the roads are easy and good.” To these requisites Varro adds—“a proper market for buying and selling; security from thieves and robbers; and boundaries planted with useful hedgerow-trees.” The arable land preferred by Columella is the “fat and free, as producing the greatest crops and requiring the least culture.” Again: the occupation preferred by Cato is that of “pasture, meadow, and watered grass-land, as yielding produce at least expense.” When speaking of plantations and buildings, Cato recommends men “to plant in their youth, but not to build till somewhat advanced in years.” Another author says—“Take care in the making of your buildings that they are equal to the farm, and the farm equal to the buildings.” On the arrival of the Anglo-Saxons, this island, according to Fleury's history, abounded in numerous flocks and herds, which these conquerors seized and pastured for their own use. The rent of land in those times was established by law, and not by the owners of the land! Very little is known of the implements or operators of husbandry during that period.—In the thirteenth and fourteenth centuries agriculture rallied to a considerable extent, and was carried on with vigour. Sir John Fortescue, in a work in praise of the English laws, mentions the progress that had been made in the enclosure of lands, the planting of hedges and hedgerow-trees, before the end of the fourteenth century. During the greater part of the fifteenth century England was engaged in civil wars, and agriculture as well as other arts declined. Soon after the beginning of the sixteenth century agriculture partook of the general improvement which followed the art of printing, the revival of literature, and the more settled authority of Government. The first English treatise on husbandry now appeared, being written by Sir A. Fitzherbert; and it contains directions for draining, clearing, and enclosing a farm. Landlords are therein advised to grant leases to farmers who will surround their farms by hedges and improve the lands. We have then a short information “for a yonge gentylman that intends to thryve;” and a prologue for the

wives' occupation. Among other things, the wife is to “make her husband and herself some clothes;” and she may have the “lockes of the shepe, either to make blanketts and coverlettes, or both. Further, it is recorded that “it is the wives' occupation to ynowne all manner of cornes, to make malt, to go or ride to market, to sell all manner of cornes,” and faithfully to bring back the money to her “lord and master.” The seventeenth century is distinguished by some important improvements in agriculture, among which are the introduction of clovers and turnips in England. That the agriculture and general prosperity of this country have been greatly benefited by the Revolution of 1688 is an undisputed fact. But the general progress of agriculture in Britain from the Revolution to the eighteenth century was by no means so considerable as from the great exportation of corn we should be led to imagine. The gradual advance in the price of land-produce soon after the year 1760, occasioned by the increase of population, and of wealth derived from manufactures and commerce, gave a powerful stimulus to rural industry, augmented agricultural capital in a greater degree, and called forth a more skilful and enterprising race of cultivators.—A brief glance at a few of the early practices, before the eighteenth century, may be interesting, and possibly useful, as showing that, even in early times, many good principles were laid down by the husbandman of old. The modern rush for “things new” certainly creates a lively interest, and leads men on to enterprises that their forefathers thought not of; but have we not unfrequently estimated too lightly ancient practices, and especially those that relate to provincial warnings? Amongst the earliest subjects that claimed attention may be mentioned those of draining, irrigation, the effect of climate, the trying of experiments, and so on. With regard to draining, I find, on referring to some old authors, that in the time of the Romans, Cato gives directions for draining wet-bottomed sands: “To make drains four feet deep; to lay them with stones; and if these cannot be got, to lay them with willow rods.” Columella directs “that the drains be deep, and narrow at the bottom.” Pliny says that “flint or stones may be used to form the water-way, filling the excavation to within eighteen inches of the top.” Of irrigation, Cato says, “as much as in your power, make water-meadows.” Of climate, an early author writes: “Whoever would be perfect in this science, must be well acquainted with soils and plants; and must not be ignorant of the various climates, that so he may know what is agreeable, and what is repugnant, to each.” Varro writes: “The ancient husbandmen, by making experiments, have established many maxims; their posterity, for the most part, imitate them.” This saying is referred to by Pliny, who says that “there were sent to Augustus, by his factor, nearly 400 stalks, all from one grain; and to Nero 340 stalks.” He says: “I have seen the soil of this field, which when dry the stoutest oxen cannot plough; after rain, I have seen it opened up by a share, drawn by a wretched ass on the one side and an old woman on the other.”—Among the leading features of practical agriculture during the

eighteenth century, we may enumerate the gradual introduction of a better system of cropping, since the publication of "Tull's Husbandry," and other useful works from 1700 to 1750; the improvement of live-stock, by Bakewell and others, about 1760; the drill-system of growing turnips; the use of lime and marl in agriculture; the tapping of springs; the revival of the art of irrigation, by Boswell; and the publication of the Bath Agricultural Society's papers, in 1780. The introduction of the Swedish turnip, about 1790; and of spring wheat, about 1795; and the reports of the Board of Agriculture about this time, also contribute to increase the products of agriculture—as the enclosing of common fields, lands, and wastes, and the improvement of mosses and marshes contributed to the produce and salubrity of the general surface of the country. The progress of the taste for agriculture about this time is shown by the great number of agricultural societies that were formed; one or more as a beginning in almost every county. Amongst these the Bath and West of England Society, established in 1777, holds the first rank. We are indebted to this society for the "Bath Papers," of which sixteen volumes were printed; they were the first agricultural periodicals of England, and were the precursors of the "Journal of the Royal Agricultural Society." The establishment of the Board of Agriculture, in 1793, was looked forward to with considerable interest, and ought to have commenced a new era in the history of the agriculture and rural economy of England at that date; but the country was evidently not prepared for so bold and comprehensive an undertaking, and it consequently effected little beyond the publication of the "County Surveys;" still it may be said to have raised the "art of agriculture" amongst the higher classes.—This brief, and yet I fear too lengthened, sketch of the early ages, brings us down to the 19th century. The more modern improvements date from this period; still it had been the early province of such men as Jethro Tull, Arthur Young, Marshall, Sir John Sinclair, Lord Somerville, the late Duke of Bedford, Mr. Coke, Sir Humphrey Davy, Bakewell, Loudon, Cully, Cline, Collins, Blakie, Parkinson, and others, to enlighten the path of agriculture before the nineteenth century. These and other good men, true patrons of the art, laid down principles which have rarely been excelled by the modern improver. A field of enterprise was now opened up, and "men of many grades" became interested in the more popular occupation of cultivating and enclosing the broad acres of our island, which had so long required this stimulus. The late Lord Leicester and the late Duke of Bedford did much towards making agriculture a popular pursuit. This was accomplished by their festive gatherings at the Holkham and Woburn meetings. These animated and descriptive gatherings went far to enlighten the many visitors who assembled from distant counties. These, on returning home, propounded the advances that had been made, which ultimately resulted in the establishment of local societies for the exhibition of native produce, and the discussion of their future prospects. Then followed the suggestion that a National

Society should be formed, for the collection and display of the English breeds of live-stock in a prepared state for the shambles of the metropolitan purveyors. The resources of our English breeds of fat stock had not hitherto been developed; and it was suggested that such a gathering of business-men and breeders at a national exhibition in London must be productive of good, and gradually lead to the diffusion of improved ideas amongst the general body of breeders and agriculturists. Then followed the establishment of the Smithfield Club, in 1798—about sixty years ago. To show the early popularity of this new society, I may mention that in 1800, his Majesty George III. was an exhibitor. In 1806 the Duke of York gained a prize, and of late years the Prince Consort has obtained many prizes with Devon cattle. Experiments in the qualities of vegetable food were instituted, and an exhibition of rude implements now formed an adjunct to the Club's display of fat animals. To this successful institution, English agriculture has been mainly indebted. It promoted the gathering of influential men, breeders of live-stock and others, who were eminent for their literary attainments; the one finding practical matter, and the other diffusing it to an advancing class of men; for the sons of agriculture had made a start. It is to this institution that we stand indebted for the parentage of the Royal Agricultural Society. The enrolment of this Society was first mooted at the Smithfield Club Dinner, on the 11th of December, 1837. In this the late President of the Club (Earl Spencer), the late Henry Handley, the late William Shaw (Editor of the *Mark Lane Express*), and the present President, His Grace the Duke of Richmond, took the most prominent part. This society has now held its twentieth anniversary for the exhibition of our English breeds of live stock, has collected and tested thousands of implements, has published about forty journals of English agriculture; and not only has it collected information, but it has been the source from which practical and scientific knowledge has been disseminated by every channel, through the length and breadth of the English counties. From the formation of this justly national society, English agriculture derives its modern type. Before this period of our history, who ever heard of a steam thrashing-machine, a reaping machine, or a steam plough? How many parts of England had never seen specimens of our established herds and flocks? What breeders anticipated a foreign trade for their produce? Who had manured his lands with portable manures from a guano bag, the produce of foreign birds? Who had thought of reducing a hard, bony substance to a soluble food for the immediate use of the root crops? or, lastly, who had anticipated the publication of such an agricultural work as the *Journal* of this society? These are results, of which we as Englishmen have a right to be proud. But in the field of our progress we have had another handmaid at work for us—I mean the press and agricultural literature of the present day. Such men as the late Philip Pusey, Wm. Shaw, Loudon, Sir John Sebright, Bayldon, Youatt, Young, Marshall did good service in this department. Amongst the other names familiar to

our ear are those of Professor Liebig, Way, Nesbit, Voelcker, Lawes, Gilbert, Thos. Dyke Acland, Thompson, Johnson, Morton, &c. In former ages but few books were written upon agricultural subjects. The first "Farmers' Journal" was published in 1808. This old and methodical paper, assisted by occasional agricultural pamphlets, formed the agricultural press and literature of the age. Such was the drug in the reading market, the distaste for new inroads, and the aversion to theorists, that this one journal had but a limited circulation. Moreover, owing to the state of the roads in those days, and the lack of post-office facilities, it is doubtful if the farmer always obtained the journal when he expected it. I will not enumerate the periodicals and newspapers which are now circulated amongst the agricultural community, except by way of illustration. I would ask who in this room would now relinquish his paper? Who, indeed, could keep pace with the progress of agriculture without the "Mark-lane Express," "Bell's Weekly Messenger," and other journals now directly devoted to the cause of agriculture? What member would now yield to the suppression of this club's monthly reports? On the contrary, are they not treasured up as records of passing events? These are gratifying results; but how have they been brought about? True it is that the Smithfield Club and the Royal Agricultural Society have been mainly instrumental in the development of the art of agriculture; but what could practically have been done without the aid of steam and railways? Steam and railways have conveyed our specimens of live stock and implements, our exhibitors, and also the inquiring public, to the national gatherings: they have conveyed our corn to market, and brought back portable manures: they have deposited our supplies of fat cattle and sheep at the best markets, free from loss of weight, and have brought in return ready cash within a few hours. This is a mighty change from the old and dreary time, when animals walked slowly to market, wasting the food of the consumer and the profit of the grazier. These new aids shorten the space of time required for certain operations, produce certainty of transit, and thus not only increase the food of the people, but materially aid in equalizing supplies and prices. In fact, if far removed from railways, we may be said to be deprived of the chief facility for our onward course; for they are daily spreading the intercourse between mind and mind, and are creating new markets and new demands for knowledge. With a view to illustration, if indeed it be wanting, I may mention the occasion of this evening's gathering. I have myself travelled 230 miles by railway to be present at this meeting. How many miles have the members of the club collectively travelled within a few hours? Even the thought of the old "coaching days" makes one shiver.—It may be interesting to mark the important progress in agricultural mechanics as another branch of industry, called forth by, and ministering to progress in agriculture. In the time of the Romans, Pliny tells us, "the corn being spread over the area of a threshing floor (a circular space of from forty to fifty feet in diameter) in the open air, a foot or

two thick, it was threshed or beaten out by the hoofs of cattle or horses driven round it, or by dragging a machine over it." Again, we are told by the same authority, "corn was cleansed or winnowed by throwing it from one part of the floor to the other." This ancient picture presents a marked contrast to our present practices of thrashing, dressing, and sacking corn at one operation, and leaving it in a fit state for market. Indeed, it is to steam power that we are so much indebted for the magical progress that has been made; and it is to steam power that we have yet to look for a much further development of the art of agriculture. Mr. Mechi has happily chosen this subject for a paper to be read at our next meeting, and I will not anticipate his remarks, which will no doubt be very interesting.—In the early part of the present century, English agriculture had warm and justly-eminent patrons, and none more eminent or patriotic than the cultivators of our established breeds of live stock. It is to such men as the late Earl Spencer, Lord Ducie, Bakewell, Quartly, Stubbins, Bennett, Buckley, Burgess, Ellman, Chapman, Price, Booth, Whittaker, and others, that we are indebted for the production of our best breeds of live stock. With a view to show how great is our debt of gratitude to these men, I may observe that our beautiful breeds of cattle, sheep, and horses have alike been cultivated from indigenous animals. If we examine the history of the sheep, we shall find that he has ever been an inhabitant of every clime, from Iceland to the regions of the torrid zone. Our English breeds were chiefly of a horned class; for instance, the Dorset, Exmoor, Norfolk, Yorkshire, Wiltshire, Shropshire, Welsh, Scotch white face, and Scotch black face, all had horns. Several of these breeds, which inhabit the yet uncultivated wastes, still remain, and are designated "horned sheep." I have said that Britain in the earliest periods of her history resembled all other countries under similar circumstances. There was nothing but bleak hills, undrained plains, and wild commons; but in the course of time, desolation gave way to husbandry, and with it came a corresponding improvement in our breeds of live stock. Thus it is that the old and unprofitable animals have given way or been transformed into the established breeds of the present day. We have had as an element those beautiful principles, which are laid down by Nature's laws, of the animal and vegetable kingdom to instruct us. These embrace a standard which man cannot alter; neither can be understand the object, without great scientific research and practical observation of the varied elements which compose the whole. It devolves, therefore, upon the husbandman to watch the laws of nature, and to found his plans upon Nature's dictates. The principles of these laws, worked out by proper rules, govern and direct the successful practice of the art of agriculture. I may best illustrate these remarks by mentioning a few of the principles recognized in our practice. First, there is the maxim that it is to the principle of steam that we must look for deep cultivation. Warmth is one of Nature's laws: hence "the principle of warmth" is good: "warmth is an equivalent to food." Animals consume or burn

away carbon in their lungs, and waste heat. Vegetables store up the means of warmth. But every vegetable requires its own particular mineral food; and if this be deficient, the plant sickens. Vegetables also need fresh air: they imbibe food by their leaves. Each vegetable has its own "heat mark," below which it stands still. The drier the soil in winter, the warmer. A rough surface causes heat to radiate, and therefore keeps down temperature; therefore moisture is retained in summer by roughening the surface of the land. And in mechanics there are certain laws as to the balance of action and reaction; as the relation between power used and space travelled over and time consumed, the connection between speed and resistance or friction; from which laws there is no escape. We may sum up thus: Our Creator has given us nature to subdue. In the struggle with nature we learn our strength and our weakness. We find our strength increased by every effort; but the further we advance the more certainly do we know that there is something which cannot be done. In a word: the first condition for mastering nature in detail is to understand her general laws, and to submit to them. These laws then become living principles of science, and bear fruit in consistent practice. Formerly the handicraft of the husbandman was looked upon as the standard of success, without which he could not be classed as a "practical man." If he ventured to read or to act upon new designs, he was at once branded with the stigma of a doomed man. This state of things reminds me of an anecdote. A certain farmer, in the good old days, decided upon giving up his farm to the elder son. To effect this it was thought best to see "The Lord" in person. Accordingly "father and son" set out for the "Hall." Then came the familiar story—

"The soil I now hold, on your honour's estate,
Is the same that my grandfathers tilled."

This over, it was found a good opportunity for reviewing the farm. The dialogue ran thus: "You see, my Lord, we have all ploughed the 'Barn Close' for years, until 'tis tired out, worn out, and grassed o'er. We have been thinking, my Lord, that as we have all mowed the 'top Woodfield' for years and years, and it grows nothing but weeds, your Lordship would let this ere boy of mine change the system a bit, so as to let the 'Barn Close' lay down, now it has grassed o'er, and plough up the 'top Woodfield' that won't grow grass." His Lordship, not quite seeing the drift of the argument, summoned his agent from "Chambers" to the country, who proceeded to view the fields; subsequently agreeing that as the fields represented the story told, and the good old man could have no interest in placing his son in a false position, the change should be allowed. The ride was prolonged and all went well until the London agent dived into matters "purely agricultural," by remonstrating with the son as to his not taking "two white crops" in succession, saying this he could not allow. The old boy at once came to the rescue, and quaintly replied, "Quite right, your honour, quite right; there's nothing like a change. It has always been our custom to sow wheat, and then black oats between it and the barley; and I wish the boy to do the

same." Whereupon the agent apologized, and agreed that the black oat crop between was an excellent thought, and evidently constituted what he had heard so much about, viz., "the alternate husbandry!" (laughter). Such was the state of things when the "handicraft" of the husbandman was looked upon as the only standard of success. Happily for the increasing population of the present day, this handicraft state of things is passing away, and we have in exchange not only the modern practices of the art, but the free discussion of all subjects which relate to the "progress of agriculture." More especially is this the case at the Central Farmers' Club. In reviewing this auxiliary I feel bound to give praise where praise is due. The happy formation of this Club on the 28th June, 1843, at once announced a new era in the annals of our agriculture, inasmuch as our very excellent and intelligent friend, Mr. Baker, of Writtle, was invited at the outset to introduce the subject of "Artificial Manures," for the free discussion of the members. Since that period this interesting topic has been discussed ten different times, and there have been up to this date no less than one hundred and ten subjects discussed by the members, each of them relating to agriculture. The question of "Tenant Right" has been before the members ten times. The agricultural labourer and his education seven times; and draining and root crops five times each. The important subjects of geology, diseases of cattle, agricultural statistics, agricultural machinery, waste lands, food of cattle, farm leases, sewage manures, the breaking-up of grass land, carts and waggons, deep cultivation, the influence of science, the rotation of crops, weights and measures, allotment system, and the education of the farmer's son, have also shared the attention of the Club. This is a result which may be written upon the broad pages of our history, in the book of agricultural progress. Well may it be asked, "What should we now do without this Club?" What would the five hundred members think if their Bridge-street sessions were terminated, and the Club disbanded? Let us rejoice that "union is strength;" let each contribute to the cause by introducing new members—only one—and our strength will be increased twofold. I have noticed that this Club has now discussed some hundred and ten subjects relating to English agriculture, none of which have convinced me so much of our growing position as the one recently introduced by Mr. Bond, upon education. That gentleman has well reminded us of the necessity of keeping pace with the times; and that it is to man's mental powers that we have to look for the future advancement of agriculture. The sons of agriculture must have an improved education, an education that will now grapple with advancing science. Formerly the mere routine practices of the year were sufficient to make a farmer's son a "practical man," and the country schoolmaster was an ample teacher for the age. But now, thanks to advanced education and scientific men, we live in an age of progress, and have yet a new era before us. And if this be a truism, then I may ask, who shall hold his own without steadily embracing the improved facilities for education that are daily being

opened up? The great point to be kept in view in the farmer's education is not to cram knowledge into the boy's head, but how to give him a good strong head; and I must add also, how to keep his heart warm. It is true that a great deal of scientific knowledge is required for a perfect theory of agriculture. But is it necessary for perfect practice? Is scientific training in early years the best means of preparing the man for the exercise of sound judgment? A perfect mastery of our own noble language is essential to express our own ideas clearly, and to understand those of others. It is generally understood that the best way to acquire a knowledge of our mother-tongue is to learn another language, ancient or modern. The great principles of mathematical knowledge lie at the root of all sound mechanics, and prepare the mind for accurate calculation, for winnowing out the real point at issue, and blowing away the chaff. I have it on the authority of a schoolmaster, whose success in recent examinations is well known, that such an education as I have referred to is appreciated by no class more decidedly than by the leading yeomanry. I may also call the attention of this Club to the fact that one of the first steps towards the improvement of the general education of England was taken at the council of an agricultural society, and is recorded in the fifth vol., page 431, of the Bath and West of England Society's Journal, to this effect: At a meeting of the Council, held at Taunton on the 28th of March, 1857, it was resolved unanimously, "That the Council fully assent to the opinion that skill in business generally is best acquired by practice, and that the best preparation for practical life is a good general education; that the co-operation of some independent examiners, with a local committee, appears well calculated to secure confidence in the results of the examinations." On these two resolutions were founded the measures for university local examinations now adopted in all parts of England. The spirit of commerce or gain urged men to an examination of substances which by their application will enable the farmer to raise larger crops, and continue their culture, without exhausting the soil to the prejudice of succeeding ones. This search for extraneous matters seems to have been pursued as an art, for science at the time had not extended her researches in this direction; though as early as about 1600 many substances now used as manure were mentioned as enriching the ground, to wit, the dung of oxen, sheep, or pigeon; sea-kelp, sea-tangle, and other sea-weeds, for arable and pasture land; and the dregs of beer and ale, brine of the strength of 1 of salt to 18 or 20 of water, the soot of chimneys, and the refuse from the refining of petre. Shavings of horn are mentioned as making productive a most unfruitful plot of ground; as also waste soap-ashes, malt-dust, and oat-husks. We may remark that Virgil even says he has seen husbandmen wet their seed with nitre and the lees of oil, that the grain might be larger. Gypsum was used as manure in 1770, and crushed bones in 1775. Now, in the foregoing we recognize many of our manuring principles; but these were not generally known and used, or, when used, they were only applied as specific substances without any but fanciful ideas re-

specting their mode of fertilizing, and their use was therefore empirical. It was reserved for the science of chemistry to point out the connection between these fertilizers and their produce, to discern the presence in the two of certain elements which were the true cause of their manuring qualities, and thence to teach us that wherever the same principles could be found we might rely upon a similarly happy result from their employment. In 1790 a professorship of agriculture was founded at Edinburgh, the Highland Society having been instituted in 1784. The Board of Agriculture was established in 1794. The Royal Agricultural Society was instituted in 1838. A professorship of agriculture was founded at Oxford in 1840. In 1840 the College of Chemistry and Agriculture was founded at Kennington by Messrs. Nesbit. In the laboratories of this establishment these sciences, with geology and botany, have been illustrated, and their application has been set forth by Mr. Nesbit's lectures and publications. In 1842 a college was founded at Cirencester, which received a charter under the name of the Royal Agricultural College, to which Professor Way, and afterwards Professor Voelcker, were attached; and there also the application of the sciences to agriculture has been taught. To Sir Humphrey Davy agricultural chemistry is much indebted, from whose time till that of Liebig no chemist applied himself to the application of chemical principles to the growth of vegetables and to organic processes. Liebig gave the greatest scientific stimulus to agriculture by suggesting the use of vitriol or other acids to render the phosphates soluble, and therefore more quickly available for the nourishment of the plant, which result was immediately acknowledged from its first trials in 1840 and 1841; the effect of this solubility being to bring the turnip quickly past the fly. About 1840 guano was first introduced into England. It has, undoubtedly, been a great boon to agriculturists; for, besides a large amount of nitrogen (the active principle of horn, soot, and other ammoniacal manures), it contains phosphate of lime, a manuring principle of bones, some being in a soluble state, and having therefore the properties of dissolved phosphates. Coprolites were discovered to be manure about the same time (that is, about 1840); and, though their phosphate of lime is in a condition unadapted for solution by natural causes, by reducing them to a fine powder and treatment with acid it is dissolved. Thus we have opened up to us an amount of mineral manure of vast extent, the discovery of which has, happily, been simultaneous with that of a process necessary for its proper utilization. It is to deeper cultivation and the improvement of our waste lands that we have now to look for the extension of our acreage produce. The earliest records of substantial enclosures date from the earliest period of the reign of George the Third, in 1760. The passing of more than three thousand bills of enclosure in a reign of sixty years is a proof how rapidly the cultivation of new land proceeded in that period; and, while the rent-roll of proprietors has been doubled, tripled, and quadrupled by this cause, the condition of the tenantry and of the labouring classes has been ameliorated in a proportionate degree. England exported

corn up to the end of the eighteenth century ; but this period was about the turning-point—a sort of pivot-period, when exports and imports nearly balanced each other. The enclosure of land now begins to mark the consumption of a gradually-increasing population and trade. A committee of the House of Commons, which sat in 1797, computed the total quantity of land enclosed during that century at about four millions of acres. We have in “ Spackman’s Analysis of the Occupations of the People ” a complete record of the progress of inclosure from the commencement of the present century to the year 1840, viz.—

From 1800 to 1810	1,657,980 acres
From 1810 to 1820	1,410,930 „
Total	3,068,910 „

Thus, during the first twenty years, the inclosures amounted to upwards of three millions of acres. But, while these twenty years present to our view the phenomenon of immense inclosure, it must be stated that this took place under the stimulant of the highest range of prices for food ever known, except in cases of famine. At the close of the war in 1815, the average price of wheat had been during the preceding fifteen years 8s. 9d. per quarter, and during the succeeding five years it was 78s. 4d. From 1820 the whole scene changed, and the most trying period commenced, the causes of which are now apparent. Three million acres of moderate land had been taken in hand, and a metallic currency was resorted to. The inclosure from the year 1820 to 1830 only reached 340,380 acres, thus gradually bringing round the natural remedy for the over doses of inclosure which the war had prescribed. From 1830 to 1840 only 236,070 acres were inclosed, showing that supply and demand had not yet righted themselves. Thus during the forty years we have an addition of three and a-half millions of acres to the cultivated lands, against an increase of upwards of 8,000,000 in the population. By the census of 1801 the population of Great Britain was shown to be 10,472,048 ; in the year 1841 it had increased to 18,664,761. Spackman then tells us that in the year 1800 we had under cultivation 42,000,000 of acres, which produced food for ten and a-half millions of people. The General Inclosure Act was passed in 1835. The fourteenth report, which has just been presented to parliament, gives the following figures—

Applications for inclosures since the passing of the act	809
Exchanges	1,697
Partitions, &c.	161
Total	2,667

Of this number 316 have taken place in the last year.	
Acreage of inclosures confirmed	281,949
Ditto ditto in progress.....	208,687
Total	490,636

Or in round numbers half a million of acres. These returns embrace a period of five years, which were included in the last decennial period from 1830 to 1840, but I have no power of separating them. It is estimated that

there are still 15,000,000 acres of waste lands capable of improvement, 6,000,000 of which would make arable land, and the remainder improved pasture ; but as the high prices from 1800 to 1820 caused the inclosure of land to an extent never equalled, so in the proportion to the decline in prices, inclosure has also declined. Still, applications for assistance to drain and improve waste land continue to be made ; and the English yeoman will, as he ever has done, adopt whatever improvements can be suggested by experience, as rent-paying practices. A national report of the waste lands of England and their capabilities would be an interesting and valuable document at this stage of our progress. Be it remembered that our population is increasing beyond a thousand per day, while the acreage of our island remains the same ; and that there is a certain limit to the high farming of richly-cultivated lands.—Amongst the many and varied practices that have aided the progress of agriculture may be mentioned the practical results of chemistry and artificial manures. These have enabled the farmer to quadruple his green crops, to place the right manure in the right place, and to economize the cost of production. The art of draining is another marked improvement of the age, which dates its further development from the “ Government loans ” for this purpose, which loans were the result of early private practice, acting on public opinion. The improvement in draining-tools and in draining-tiles has contributed to the success that has been attained, and is rapidly progressing ; for without this auxiliary, upon certain soils cultivation is simply useless. The growing knowledge of atmospheric influences has had its share in the work, and gone far to arouse the dormant intellect upon points relating to geographical position, the geography of plants, the influence of light and heat, seasons, winds, &c. The enclosing and improvement of waste land has also formed a prominent feature ; and the improvement of local and farm roads is a link in the chain of progress. The attention which has been directed to the education of the labouring classes, the improvement of their cottages, and the allotment system has not been without effect, each of these being an evident requirement for the improved class of men who are daily being called in to request to perform the altered cultivation upon the farm. In effect the occupation of the man who thrashed the barn-floor for the natural term of the winter months, is gone. His son succeeds him as an engineer, or the director of a steam-engine ! The improvement in farm buildings is another requisite for the times, and has been liberally carried out for enterprising tenants. The “ rotation of crops ” has of necessity received much attention, alike in the field, in the laboratory, and in the discussions of this club. The practical issue is this : the four-course shift was invented and adopted for the purpose of improving the land ; this has been done to a heavy amount, and it now requires correction, by the introduction of another corn crop, extending the four to a five-field course. The Scotch system is that of the six-field course—roots, white straw crop, seeds, white crop, beans, and white crop. The extension of root and other green crops since the introduction of artificial manures has con-

tributed to the increase and excellence of our live stock, in a truly marvellous degree—a profitable result. Agricultural statistics have been the subject of many attempts; but although we have had many interesting statements with regard to agricultural produce, the movement has not been received very graciously. Time alone can show how far an altered taste may lead to different results in future years.—Irrigation is a practice which, although chiefly confined to the western counties, has deserved well of the farmer. It has done its part in the production of green food in early spring, and abundance of hay at shear time, at a nominal outlay. This practice is well worthy the attention of proprietors and tenants of hilly districts, “where the plough cannot penetrate,” but “the rippling stream can flow.” At the request of Mr. T. Dyke Acland, a paper “On Water Meadows as suitable for Wales and other mountain districts” was prepared by Mr. T. Barker, of Pusey (agent on the Pusey Estates), for the last Journal of the Bath and West of England Society. I mention this because the paper is not only well worthy the attention of all “hill farmers,” but is about to be reprinted for general use, especially for the principality of Wales and the Westmoreland Lake districts. The grass lands of England have also received some attention of late, but by no means in an even ratio with the favoured arable lands. There is indeed, a nice point of distinction to be drawn on this head. Can we improve moderate grass land by top-dressing to a profit? or are they such as would pay best for cultivation? Local circumstances can alone decide, climate being the ruling power. As regards the tenure of land, the question of an equitable arrangement for ensuring good cultivation versus loss of time and capital, when tenants are changing farms, has been freely and fully discussed of late, and discussion is happily resulting in a better understanding of the necessity for such an arrangement. Progress will effect much in this way; and although we may be met in the outset by opposition and by surprise that there should be such a term as “tenant right,” equity and improved culture will ultimately become the universal practice. In fact, the principle is being acted upon in present lettings, to a considerable extent. The subject of “agricultural customs and covenants” has been fully before the council of the Bath and West of England Society, and the result will shortly appear in the Society’s forthcoming Journal. Deep culture by the aid of steam-power is yet in its infancy; but, as a consequence of progressive art, it will ultimately do much for agriculture, by deepening the tillage earth of countless acres which cannot be profitably moved by any other power. This leads me to the remark that there is yet wanting a better comparative knowledge of the several powers engaged in agriculture, such as steam, horse, water, and manual power. On the subject of “horse power,” we have an excellent report in the last Journal of the Royal Agricultural Society, by Mr. Morton. It should be well read, and weighed against the present papers that are being daily written upon steam-power, lest our zeal for “things new” should carry us out of our depth—or we might say below our

depth. As regards manual labour, we are daily seeing it supplanted by mechanical aid. From my present acquaintance with water power in a hilly country, I can strongly recommend it to all who have the power of water within reach of the farmstead. The enormous additional weight of green food that has been produced of late has rendered practicable the maintenance of larger herds of cattle, increased flocks of sheep, &c., and thus supplied an additional weight of *animal* food for the growing wants of the people, and the increasing *foreign* trade in English animals; while the fact that the price of meat keeps up, while corn has fallen, has happily falsified some doleful forebodings. The practical value of these increased products is best illustrated by a quotation from Mr. Middleton’s work. He observes, “that every acre would support its man, on *vegetable* food;” but, says he, “only let him change his diet to one meal per day of *animal* food, and he will require the produce of four acres.” In connection with root crops may be mentioned the intrinsic value of mangold-wurtzel. It is being cultivated to an enormous extent, and has happily come to the rescue of many a farm where the Swedish turnip has become less hardy than in former years, or, more properly speaking, less inclined to flourish on the same soil, once in four years, under the four-course system of husbandry. Autumnal culture has stood the test of experience, and remains as a valuable saving in the cost of clean farming; but as respects light lands, the practice is yet a doubtful one. This class of remarks might be carried on for an hour: there are indeed so many plans for every branch of our art, that I had better conclude by referring members to the pages of the Royal Agricultural Society’s Journal, and those of the Bath and West of England Society’s Journal, as records of all that is good and worth recording. The extension of commerce and manufactures has proved a valuable adjunct to the increase and consumption of agricultural produce. More raw materials, as flax, wool, &c., are required, manures from foreign lands are exchanged for goods, and we must not omit the precious metal, and its abundance to this country, whereby all things agricultural have shared in the golden harvest so unexpectedly supplied. The ultimate results of the gold discoveries it would be unsafe to predict; suffice it to say that the effects of the increase of gold require the serious forethought of the statesman. Amongst the facilities that have recently been afforded to agriculture, we may mention the Government Drainage Act, the Inclosure Act, the New Poor Law Act, and the Tithe Commutation Act. The advantages afforded by the Fire Insurance offices, the Drainage, Building, Hail, and Cattle Insurance offices, have each in their way helped along the well-being of those that are prominently interested in them.—Thus far, I have given a glowing account of the “progress of agriculture” from the early ages to the present time. But what shall I say of our disappointment and misfortunes? We have, in truth, had our vicissitudes and losses by the diseases of our live stock, wet harvests, failure in our root crops, and low prices for our cereal produce, while the cost of

manual labour has (from various causes) increased. Again, it must be mentioned that the English farmer has to depend upon his own exertions, and cannot look to Government grants or Government assistance. He has no statistics or history of his art; he has no adjustment of his weights or measures, no board of agriculture, no minister or representative in the State. But yet he has held his ground, and continues to feed the people. The future of our agriculture is full of interest. There are subjects before us well worthy of consideration. Amongst them is a growing desire to treat agricultural pursuits upon "commercial principles." From this cause the occupation will become commercial, small farms will have to succumb to large ones, talent and capital will reap their reward; education will progress, the tenure of land and security for unexhausted improvements will become matters of fact, as commercial transactions. The project of steam-power has been boldly launched, and the ingenuity of man is now at work to adapt it for general employment; but this is yet a venture, and has an eminence to surmount that will require the talent of an age. The Royal and West of England Agricultural Societies have each offered a liberal prize for an Essay "on Steam Cultivation." These prizes may bring out an amount of talent that may aid the movement; but the "plant" as yet produced is far too costly for general adoption. There is yet considerable room for perfecting our breeds of live stock, that they may become more generally developed in "every district, and the right animals be cultivated in the right place." The economical consumption of their food, early maturity, and a better knowledge of their diseases, are alike essential to our future good. The extension of draining is another very important element; and it would be well if the Government grants were extended upon a liberal basis. The waste lands of England are again waiting for improvement, and offer an inviting field for enterprise in juxtaposition to that of emigration to "a land we know not of." Artificial manures are yet in their infancy; it being no uncommon thing to realize and consume a crop of roots before they are paid for, thus commercially-improving the farm by manures and sheep to the full benefit of every one, at little cost to the farmer. The improvement of grass-land is indeed a national subject, and must follow the advances of the arable lands. A series of experiments upon grass-lands, conducted under the management of an agricultural society, would elicit much practical information as to the results of different manures, the soil and situation being well considered. Amongst other public questions, there yet remains for consideration an adjustment of the "weights and measures" by which agricultural produce is sold; the establishment of a better system of taking the corn averages; a reconsideration of the malt tax, agricultural statistics, the adjustment of the game laws, so as to substitute "winged game" for the four-footed trespassers; a better understanding of the law of "customs and covenants," as regards the quitting of a farm; an extension of the Government draining loan; and lastly, the preparation of a new and complete "Ord-

nance map," upon a large and comprehensive scale, under the direction of the Government (cheers.)

Mr. E. B. ACROB (the Temple) was not surprised to find so large an audience; and was greatly indebted to Mr. Smith for bringing on the question of agricultural progress, as he has fairly exhausted every topic. He (Mr. AcroB) was old enough to remember the time when in the western counties scarcely a neighbour looked over his neighbour's hedge, and the sheep were so bad from starvation on the hills, that, instead of fulfilling the old nursery rhyme of "bringing their tails behind them," they were in fear of losing them altogether, from being bred in-and-in, instead of being renewed by the good services of Messrs. Jonas Webb, Ellman, and Bennett's high-bred stock; but during the last twenty years a wonderful change had come over the scene, owing to the happy union of practice with science. So long as the corn laws existed the question of agricultural improvements were not much mooted, and for this reason—the then existing fluctuating duty operated as a premium on the growth of corn in this country, to the exclusion of foreign produce, and farmers went on doing very well in their usual jog-trot way. But the gradual advance in the price of land derived from manufactures and commerce gave a powerful impetus to rural pursuits; gentlemen turned farmers with the hope of making money, augmenting agricultural capital, and calling forth a more enterprising race of cultivators, and an economy of labour by means of machinery, which laid the foundation of that success which had placed us in the proud position we now occupied in the eyes of foreign nations. They had also now a tenant-right, giving the tenant a compensation for unexhausted improvements before the conclusion of the tenancy, over and above those of common husbandry covenants; as also remedies for enforcing the taking or payment of farm fixtures, either by the landlord or the money-tenant, subsequently embodied in the Landlord and Tenant's Act of the 14 & 15 *Vict.* c. 25; so much so, that tenant-right agreements were fast superseding the old obsolete ridiculous set of covenants which incumbered old farm leases, and which seemed as if they were framed in the days of the patriarchs of old.

Mr. W. BENNETT (Cambridge) said that the lecture to which they had listened from Mr. Smith was, in his judgment, calculated to be of great service to the country. It enabled them to look back all the way they had travelled for 40 or 50 years, to note what they might have done well and usefully, what they had done ill, and in what they might mend matters for the future. Mr. Smith had mentioned the fact of the introduction of the Swedish turnip about 60 years, and he (Mr. Bennett) recollected that when he was a boy everybody was turning his attention to its culture. It was lamentable to think, however, that the swede had lost much of its merits in many parts of the kingdom. In his neighbourhood, for instance, it had been so extensive a failure during the last few years, that they had begun to question much whether or not agriculture was to be promoted by the continuance of its growth. The matter was one of vast moment, inasmuch as everybody knew

that a large portion of human food had been produced by using Swede turnips in stall feeding and the feeding of sheep. It had now become a grave question amongst many intelligent farmers whether they must not abandon the swede, and substitute for it the mangold or kohlrabi; and a next-door neighbour of his had been spirited enough to expend £25 in purchasing a single cwt. of kohlrabi this year, so satisfied was he, after five or six successive years' failure, that swedes were not to be grown profitably on his farm. He had determined, therefore, upon substituting kohlrabi or mangold wurtzel almost exclusively. There was no doubt that farmers must look to their fallow crop largely to produce meat and to pay their rents. Every one who knew anything of farming must know that if they did not make the stock pay the rent of the farm they would do badly; and that if they did not manage on the four-course system of husbandry to make the fallow crop produce something considerable, they would not be able to look their landlords pleasantly in the face. So far as his own experience went of the value of kohlrabi, he had found it a very excellent substitute for the swede turnip, more especially after a green crop. He had not only grown a portion of his fallow crop with kohlrabi instead of swedes, but, wherever tares, Italian grass, or other green crop had been grown to be taken off green, he had found that to transplant kohlrabi in July had produced an excellent crop—in fact, the most valuable upon the farm, and most useful for sheep, especially in the spring of the year. His ewes and lambs had been living upon it for six weeks past, and that with the very best results. Among other improvements, then, which he thought they would have to adopt was this—of substituting other crops for swede turnips. On some soils the failure of swedes was very extensive; they “rotted at the core,” and when they might naturally be expected to go on and produce a good crop, they drooped and died, however high the cultivation. There was one point in reference to which he could not quite agree with Mr. Smith. His friend was a little too much disposed to put down what had been termed “thrashing with two sticks,” and he (Mr. Bennett) must take the liberty of questioning the prudence of his friends when they seemed inclined to go too fast, although he might be considered one of the “old school” for so doing. He did not mind a reproach of that sort, however, provided he could only come at the truth. (Hear, hear.) Now he did not mean to say that the thrashing machine was not a valuable implement of husbandry, or that the steam-engine was not an important substitute for horses; but he had yet to learn that, invariably and at all times, either was superior to thrashing with “two sticks.” He had this year thrashed barley both with the machine and with hand labour. In one of his own men, indeed, he possessed a better machine than he had ever yet seen constructed of iron. That man had earned his 15s. a-week regularly throughout the whole winter; sometimes as much as 17s. 6d. in thrashing barley; and he did the work infinitely better than the best thrashing machine. He believed that the thrashing of barley by hand was cheaper and better than the thrashing of it by steam;

and the superiority of the former practice was especially observable in the winter months, when labour was plentiful. He had himself invariably got the work performed in that way for 2s. a quarter. In such matters it became them while they “prove all things,” to “hold fast that which was good.” (Hear, hear.) Let them not repudiate all the ideas of their grandfathers, as if they were a set of fools. (Laughter.) No such thing; many of them were as intelligent as any of themselves. (Hear, hear.) It was often assumed that under-draining was never thought of until recently. But was that the fact? Why his own father obtained a prize for under-draining forty-five years ago. They must not put down everything that was good to the account of the present generation; there were men who knew something about agriculture before we came into existence; and as regarded the thrashing of oats and barley he certainly considered that it was done more cheaply and satisfactorily by manual labour than by steam, more especially in the winter. (Hear, hear.) With respect to root crops, it was of the highest moment that they should endeavour to find either some substitute for swedes or some mode of stopping their decay. (Hear, hear.) In his opinion, it would be worthy of the Royal Agricultural Society of England to try and discover why a root which once answered so well in this country was no longer to be depended upon. He had observed that the failure was less on a soil with a chalk bottom than anywhere else. For example: In the neighbourhood of Luton, where there was a chalky subsoil, the failure was not so great as where the soil had a gravelly foundation. Speaking generally, he agreed with Mr. Smith that there was no country in the world where agriculturists had made such progress as was seen in England, both with regard to stock and with regard to the cultivation of the soil. It was very common for persons who lived in large towns to speak of English farmers as if they had done nothing in the way of improvement; but no one would say that, who duly considered what a large and increasing population they had succeeded in feeding. (Hear, hear.)

Mr. SPEARING (Moulsford, Wallingford) wished to corroborate what had fallen from Mr. Bennett with regard to the thrashing of barley. He had two steam engines, which he did not let out, and he found it more profitable to thrash by hand than to employ those engines for such a purpose.

Mr. H. TRETHERY (Silsoe) thought the discussion ought not to be narrowed to a consideration of the comparative merits of thrashing by steam and thrashing by hand. (Hear, hear.) The subject was, in fact, a most comprehensive one; and Mr. Smith must have felt that, when he proceeded to prepare his introduction. He would not follow that gentleman by tracing the progress of agriculture from the earliest period, but would offer one or two remarks bearing on its recent development. He thought they owed a great deal to legal enactments, and more particularly to the Tithe Commutation Act. Those who knew what farming was before that Act was passed must be aware that before that time it was impossible to improve land. However good the intentions might be, however strong might be the desire to improve the cul-

tivation of the soil, improvement could not be effected, because the larger the crop grown the more the farmer had to pay. If land which produced only ten bushels an acre were made to produce forty, he had to pay a tenth of the increase—no power could prevent it; and hence the passing of the Tithe Commutation Act removed one of the greatest obstructions that ever stood in the way of the progress of agriculture. (Hear, hear). As regarded the poor-law, it was unnecessary for him to remind them of the disadvantages which pressed upon agriculture under the old state of things, and of the benefits which resulted from the alteration that took place a few years ago. The sciences also had come to their aid, and in particular they had derived great assistance from chemistry, geology, and botany. In short, they were now enjoying advantages which were not dreamt of fifty years ago. What the next fifty years would produce it was impossible to say, but there was reason to hope that they would be marked by progressive improvement.

The Rev. T. C. JAMES said the history of agriculture was in some degree the history of the world; the three first men in the world being a gardener, a ploughman, and a grazier. "Progress" being now the farmer's watchword, "Onwards!" his motto, the cultivation of the mind and the acquisition of knowledge were manifestly as essential to farmers as to any other class of society (Hear, hear). This was the more evident from the artificial state in which agriculture now was. It was artificial because of the extended use of complicated machinery and of scientific appliances in the operations of the farm; because of the race which was going on between manual industry and mechanical inventions; because of the wondrous power of steam—a power so astonishing that it was estimated to have added to the power at man's disposal for ordinary purposes a force equal to that of ten millions of labourers. The practical deduction from all this was, he said, that the farmers of England should endeavour to advance themselves in intellectual attainments, and to cultivate, at their various homesteads and in their various parishes, skilled men for skilled labour—quick, active, and intelligent men, adapted to modern requirements; or else the present race of farmers must yield to others who would pursue a course which was adapted to the energy, enterprise, and intelligence of the age (cheers).

Mr. SIDNEY said, when addressing, as he was in the habit of doing, the non-agricultural public, he spoke to them of what farmers had done, and explained that they were not so far behind as a few years ago it was the universal custom to represent them to be; but when he met farmers themselves, he felt bound to take a different line, and, speaking historically if not practically, to deal in something else than compliments (laughter). Farmers were, like other human beings, too apt to indulge in self-laudation, especially at agricultural meetings; and in that he had no wish to encourage them. There could be no doubt, indeed, that at the present time English farmers stood at the head of the agricultural world. But, though they had attained a position, practically and scientifically, which had never been

attained before, they had not done so in the manner that they sometimes supposed: they had not attained it solely as farmers, or by handing down from father to son traditions as to farming pursuits, unconnected with the intervention of men of any other calling. Any one who listened to the speeches of many agriculturists, might suppose that they were a class apart—that they had nothing to do with townsmen or with any other class of society. According, however, to his view of the history of agriculture, almost every change which had produced a decided improvement in agriculture was an importation either from a townsman or from a foreigner (laughter). Unlike the state of things in France, there had in this country been a constant flux and reflux, a constant flow of sharpened intelligence, between the towns and the rural districts. There was a continual migration going on from town to country. If they examined the history of any man who was now eminent as a country squire, they were almost sure to find that his grandfather was a townsman (laughter). The grandfather of Sir Tatton Sykes was a merchant at Hull; the father of Mr. Farquharson was a gunpowder-merchant. The things which had done most to promote the recent development of agriculture were improved implements, artificial food, and foreign manure. One of the most important of modern implements was the drill; and it was a parson—the Rev. John Rook—who invented it. In like manner, it was a Scotch minister who invented the reaping machine; and there were a great variety of other implements which certainly did not owe their origin to farmers. The most important root in modern agriculture was perhaps the turnip; and that was of foreign derivation. So also were the carrot, Dutch clover, and Italian ryegrass. Oilcake and guano were in the same category. The very strength of agriculture, therefore, lay in its communication with the towns and with foreign countries: without such an interchange, it would have been absolutely impossible for it to attain the development which it now exhibited; and, while this tended to foster a good feeling between the inhabitants of the towns and those of the rural districts, it was the best and only means of securing the continued progress of agriculture.

Mr. WHISTLER (Overton, Hants) said, the progress of agriculture seemed to date from the commencement of the four-course system. That system had its origin in the introduction of the turnip, not on account of the intrinsic value of the turnip, but because of the change of plants which it allowed. He thought the present unhealthiness of the turnip was owing to its too frequent use, and to the non-use of kindred plants, such as clover, peas, beans, parsnips, and rape. Mangold, which had been used lately with great success, belonged to the vetch tribe, including tares, sainfoin, mustard, and carrots. The production of each of these was injurious to that of the others, and he thought that afforded one explanation of the failure of clover after peas, beans, and rape. Wheat, barley, oats, and rye-grass were a perfect change, and seemed to be the best producers of the turnip and likewise of the other tribes which he had mentioned. He did not see how they could entirely dispense with

the swede, but he thought it would be a great advantage to alternate it with mangold-wurzel. There was a chemistry in plants which required great attention; in robbing the soil, as it were, of their own tribe, they prepared it for an opposite tribe.

Mr. SKELTON (Sutton Bridge) thought the subject of the progress of agriculture required some reference to the question of establishing a uniformity of weights and measures. Since he entered that room there had been placed in his hands a copy of a bill relating to that subject, which had been recently introduced into the House of Commons by Mr. John Locke, Mr. Adams, and Mr. Hunt, and which he thought was well worthy of the attention of agriculturists. Indeed so great was the irregularity which prevailed, so striking the want of a uniform system, that farmers would show themselves behind the age if they did not do something towards securing an alteration. There was another bill before Parliament, besides that which he had mentioned, it having been introduced by Mr. M'Cann, an Irish member, connected with the Liverpool trade, the object being to establish the buying and selling of corn by the 100lbs. Considering that the tithes rent-charge, corn rents, and import duties were calculated from returns based on the imperial quarter, he thought that on the whole the best uniform system would be a system of measure. As regarded the disputes and difficulties connected with the niceties of measuring, he might remark that in Norfolk and South Lincolnshire, the great point being to get at the natural value, it was customary to ascertain how much a bushel weighed, and, whatever the weight might be, the merchant and the farmer were guided by it. He was not prejudiced in favour of measure, though he considered it best on the whole; but some uniform system must be adopted. He believed the two bills to which he had referred were to come on for consideration about the 13th of April.

Mr. E. TATFERSALL (Hyde Park Corner) said, as they were met to discuss the progress of agriculture, it had occurred to him that it depended in a great degree on their being able to obtain a sufficient quantity of the best artificial manure; and as an inhabitant of a town, he was reminded how little had been done, thus far, to secure that object (Hear, hear). While chemists had said so much on that subject, they seemed to have forgotten that there was at their own doors a mass of refuse which might be converted into a source of untold wealth. It was for farmers to urge that subject on the attention of chemists; and in his opinion it would be a stigma and disgrace to them if they did not reduce the refuse of London to a suitable form for increasing the crops of their country (Hear, hear). At present it was only a nuisance to society, whereas it might be made an immense advantage, and he trusted the day was not far distant when London alone would supply guano enough for a great part of the lands of England (Hear, hear). As regarded the general question, he was one of those who thought that agriculturists were quite on a level with other classes in the race of improvement. He would be a rash man who said that agriculture had reached perfection; but looking at

the increase of crops, and the general progress of agriculture, he maintained that farmers were quite equal in energy and advancement to any other class of society. As to the deterioration of the turnip, he doubted whether it was not in some degree owing to the constant repetition of a peculiar kind of manure.

The CHAIRMAN, in summing up, adverted to the remarks of Mr. Skelton, observing that that gentleman appeared to be in favour of both measure and weight—a combination which he could not at all understand.

Mr. SKELTON said he did not advocate legislation on the basis of measure and weight, but on that of measure alone.

Mr. SMITH, being here called on, said: In rising, sir, to reply to the several addresses that have been delivered this evening, I must first express my regret that the discussion has not taken a bolder and more comprehensive turn upon this national subject—a subject that embraces the employment of millions of our fellow-men, as also millions of English capital. I could have wished, on the one hand, that our friend Mr. Acton's zeal had been abated for a time, until some one of our country friends had addressed the meeting, a good start being one of the great essentials to a good end. Mr. Bennett has well called your attention to the failure of the turnip crop, and suggested as a substitute the "kohl-rabi" plant. Lest parties might be led away to make an extensive change for this plant, I beg to remind them that this root was tried by my father in Lincolnshire, some thirty years ago, and to the extent in one instance of a ten-acre field, but it was not continued in after-years. This plant, like the cabbage, has its merit in that of being transplanted from the seed-bed to the cultivated soil, after vetches, rye, &c. Still, such a process is an expensive one, and unless the land be rich in nature, the bulbs, from their peculiar formation, will not swell to a great size. When well-grown by early planting, &c., they are found to be a useful portable crop. Mr. Bennett has misconstrued my allusion to the thrashing of corn by manual labour *versus* steam. I gave it as an illustration of the change of circumstances, showing that the sons of toil must have a better education for the advance and advancing practices of the farm. The remarks of Mr. Whistler are worthy of our best consideration, and let us, before we run counter with our friend the Swedish turnip, well consider if we have not committed the error of planting him too frequently in the same field. We talk familiarly about the land being "clover sick:" is there not such a thing as land being "Swedish turnip sick?" I speak from great experience when I tell you that upon the *new soils* of my neighbourhood, we know of no disease in our root crops: they are vigorous in the extreme. I agree with Mr. Whistler, that there are families of plants, and that they best succeed each other at long intervals. I am not aware that I need reply to any other remarks that have been made upon the subject of my paper. But, sir, I should be wanting in courtesy to the cause of agriculture if I did not reply to Mr. Sidney's attack upon its progress. Indeed, Mr. Sidney seems to be in a dilemma, inasmuch as he has two pur-

poses to serve, viz. : to extol agriculture and its patrons before a "town's population," and to ridicule it before the members of this and other agricultural societies. Mr. Sidney told us that he had only just entered the room ; yet the time had arrived when he must make his speech. I regret this, and the more so, as his remarks did not in any way apply to the discussion. Indeed he has told us that we are dependent upon everybody, and that nobody is dependent upon us. I would for the moment inform him, that our island was once a common waste, and that now the foreigners (of whom

he has said so much) are our best and constant customers. With regard to our being indebted to a clergyman for the invention of the reaping-machine, I can only say that the reaping-machine was even used in the time of the Romans ; certainly, if we judge from the drawing, it formed but a rude implement, yet sufficient for the day (cheers).

Thanks were then voted to Mr. Smith and the Chairman respectively, and with these acknowledgments the proceedings terminated.

THE CONDITION OF THE AGRICULTURAL LABOURER.

The progressive improvement by which the course of agriculture has been marked during the last fifty years is beginning to be a stale subject ; not because those interested in it are flagging in their efforts or zeal, or that the accumulating mass of useful innovations already introduced has exhausted the ingenuity of those with whom they have originated ; but because, on the contrary, the modern system of husbandry, like that of every other branch of national industry, has become a much more serious and absorbing business than formerly ; so that the farmer has now so much to do that he has less time to *talk* about it. Competition in any branch of business is a wonderful stimulant, and brings into exercise a mental energy and power in many an individual, who is as much astonished as his neighbours at the unexpected development.

Perhaps in no department of farming operations has improvement been more palpable or more sedulously carried out than in the care and attention bestowed upon the different races of animals, for which lofty and well-ventilated comfortable apartments are built, abundance of rich food provided, cleanliness and health sedulously promoted, and every means resorted to, to attain the great object of the farmer's solicitude—a speedy preparation of the animals for the butcher, and thus an early realization of the profits of the transaction.

But whilst such incredible pains are taken to provide for the well-being and comfort of the superior animals, the quadrupeds of the farm—whilst the cattle, the sheep, and even the pigs, are thus anxiously cared for and plentifully fed, how is it with the *biped* race?—if we may be allowed for *once*, by way of illustration, to use so mean and low a term in speaking of the agricultural labourers of England. In more respectful language, if the irrational animals are thus become the objects of the farmers' attention, surely the welfare of those beings on whose efforts they depend for their prosperity, and who possess powers and faculties infinitely superior to those of the fortunate brutes to whose welfare they are employed to cater, is entitled to the first consideration. In point of ability to provide for their own comfort and welfare the two classes—the rational and the irrational—stand upon equal terms ; for assuredly the low wages of the agricultural labourer render it impossible for him to do more than provide food and raiment for himself and those dependent upon

him, and scantily enough of these. For education, house accommodation, and sanitary arrangements, he must depend on his employer, the farmer, or on the landlord. His moral and intellectual advancement, which are closely connected with those objects, it is utterly out of his power to provide for, or even to occupy his mind upon, so helpless and impotent does his normal condition of poverty render him.

We have frequently referred to this subject in our columns, and have again and again urged upon the farmers the consideration that it is not only their duty but their interest to attend thereto, and to provide such accommodation for their labourers as shall enable them to bring up their families in decency and respectability. In proportion as this object is pursued, and the moral and physical welfare of the labourer promoted, are the incentives to vice and crime diminished, and the self-respect of the labourer instilled into his mind. These results will assuredly be accompanied with a diminution of crime and pauperism, especially illegitimacy, now so prevalent amongst that class, the inevitable result of that mingling of the sexes of a family in the inadequate dwellings they are compelled to inhabit. This is abundantly proved in a pamphlet recently put into our hands,* and which has led us again to take up the subject. The author shows, beyond a doubt, that it is "*the single bedchamber in the two-roomed cottage*" that is working this destruction of the moral sense of the agricultural classes, leading to illicit intercourse of the most painful and shameful kind, in which the ties of blood are too frequently disregarded.

Quoting from a letter in the *Farmer's Magazine* for October, 1850, the writer shows that it is chiefly the prejudices of the farmers that stand in the way of any improvement in the condition of their labourers ; and that whilst seeking to raise their own children into the classes above them by education, they resolve to keep down the moral and intellectual character of their labourers, lest they too should aspire to a like elevation. "There are others," says the writer, "who give their own children the benefit of the best education they can

* An Address upon the Condition of the Agricultural Labourer. By Henry Tucker. Delivered at the Annual Dinner of the Farringdon Agricultural Library, on the 25th of November, 1855. E. M. Atkins, Esq., in the chair. London : Longman and Co. Farringdon : T. Knapp.

afford, but who deny the same boon to the child of the labourer. It is but a few days since I met one of this class. He did not like the present order of things at all. 'There was too great a tendency in society now-a-days to upheave that which was below to the top. Labourers were anxious to become masters, and so on. To educate the labourer was only to enhance the evil. The child should succeed his father at the toil.' His own son was then at the University, and was studying for the Church."

The fearful extent to which this disregard of the moral and physical welfare of the farm-labourers is carried, is forcibly shown by the writer of the letter, and well commented upon by the author of the address. An awful case of one parish in Berkshire is too graphic and striking to be omitted by us. "Perhaps the most striking instance of the demoralization of a whole community from overcrowding and other unpropitious circumstances, is that furnished by Sutton Courtney in Berkshire. When England was first divided into unions, that of Abingdon was about the first to be marked off. The people of Abingdon were willing that the commissioners should draw any line they please, provided they only excluded Sutton Courtney from the union. Its character was then so bad, that the people of the neighbouring parishes recoiled from the idea of being comprehended within the same division with it. The commissioners having acquainted themselves with the grounds on which the request was made, complied with it, and Sutton Courtney was erected into a union of itself; on the understanding, however, that whenever it amended its character, it should merge into the Abingdon union. It is now part and parcel of that union; from which it is to be inferred that its character is somewhat improved. It was therefore in its amended state that I found it. Judging from its present condition, it must formerly have been inconceivably bad; or the people of Abingdon have been satisfied with very slight tokens of amendment—the place is, to this day, a focus of intemperance and debauchery of every kind."

Reference is made by Mr. Tucker to the admirable and praiseworthy proceedings of the "County of Kent Labourers' Friend Society, for improving the dwellings of the Labouring Classes," in which all ranks of persons, from the peer to the farmer, have united their efforts, having come to the conclusion that one of the first steps in the work of moral improvement is the providing of dwellings for the labourers, in which the sexes of the children can be lodged in separate rooms. Carrying out the principle involved in this conclusion, they have built cottages with three separate sleeping rooms, at the small cost of £170 the pair—that is, two cottages with three bed-rooms and one sitting-room each, for that sum. Models of these buildings, including plan, elevation, and interior fittings, in lithographic drawings, are now to be had for 5s. each, on application to Mr. C. J. Cooke, 2, Middle-row, Maidstone; Mr. Martin, 18, Adam-street, Adelphi; or Mr. Debenham, 80, Cheapside.

We have copied these addresses for the benefit of those of our readers who may wish to adopt a plan of the kind, but do not know how to set about it in the most economic manner. We also hope that by giving this additional publicity to the admirable Kentish institution, we may stimulate other districts to follow the example, or at any rate lead them to make inquiry into the working of the system, which we are sure will prove satisfactory.

The time is come when the subject of the moral, intellectual, and physical condition of the rural population will force itself upon the people of England. *That class is half a century behind* the corresponding classes of operatives in our cities and towns, in all these respects, and must be elevated sooner or later. The spirit of the age demands it, and the changes now in progress in the mode of cultivating the soil will render the education of the labourer a matter of necessity, and the physical improvement of their condition one of *prudence*. We offer these hints to our agricultural readers in the hope that they will take the subject into their serious consideration, and act accordingly.

THE PROGRESS OF OUR WOOLLEN MANUFACTURES.

Early last year we called attention to the increased production of wool, home and foreign, and examined in detail some of the generally received estimates of the annual produce of British wool. The subject is of itself so important, and the difficulties in arriving with any precision at the full particulars are so great, that we are always glad to find the subject occupying the attention of men capable of arriving at a sound judgment. The last number of the "Quarterly Journal of the Statistical Society" contains a very important paper "On the Woollen Manufacture of England," as read to the British Association for the Advancement of Science, last year at Leeds. Mr. Baines is so competent an authority, from the facilities of investigation he possesses in Leeds, the ancient seat of this great branch of manufacturing industry, that we are

induced to examine closely his details, and to furnish an abstract of the very important statistics and deductions he arrives at. Largely as the cotton manufacture has increased, the woollen manufacture approximates more closely to it in aggregate value than is generally supposed. The processes through which wool has to pass are greatly more numerous than those required by any other textile manufacture: and they are performed by a much greater variety of machines and of work-people.

Another fact which retards the advance of the woollen as compared with other textile manufactures, is the higher price of the raw material. The average value of the sheep's wool imported in the three years ending with 1856 was 1s. 4d. per lb., and the average price of English wool in the same years was about 1s. 2d. per lb.;

but during those three years the average price of cotton wool imported was only 5½d. per lb., and that of flax only 5d. per lb. So that wool is about three times the market price of the two vegetable substances which form the raw materials of the cotton and linen manufactures. Nor can sheep's wool be augmented in quantity so rapidly as raw materials which merely require the cultivation of the soil. The fleece, at least in this country, forms only a small proportion of the value of the sheep on which it grows, and the sheep farmer is more dependent on the demand for his mutton than on the demand for his wool. Now the consumption of animal food only increases, as a general rule, with the increase of population; and hence there is a natural restriction on the supply of sheep's wool, owing to which restriction the price is kept high.

The largest supply of the raw material is from the United Kingdom; but nearly half the domestic wool is consumed in the worsted manufacture, and the other half is used for the lower kinds of woollen goods. Within living memory, Yorkshire cloth was made exclusively of English wool, though Spanish wool has been used for more than two centuries for the finer cloths of the West of England.

The cloth of the present day is immensely superior, both in fabric and in finish, to the cloth of half a century back. Working men now wear finer cloth than gentlemen wore then. In the last half of the eighteenth century, the import of foreign wool fluctuated from a little under to a little over two million pounds weight a year; but last year the quantity of foreign and colonial wool imported was 124,528,000 lbs., of which about 98,000,000 lbs. was retained for home consumption. The changes which have taken place in the sources of supply during the century are remarkable. While in 1800 to 1810 we received 6,000,000 lbs. annually from Spain, now we do not get half a million pounds a year from thence. Of German wool, we scarcely received any in the beginning of the century: twenty-five years ago we received the largest proportion of our foreign supplies from thence, about 26,000,000 lbs.; but now India and our colonies contribute the great bulk of our foreign supplies.

Though a large part of the raw material is grown at home, we have absolutely no reliable statistics of the amount of this famous product of the British Isles. The judgment of those even engaged in the trade varies very widely. The late Mr. John Lucock—a wool merchant of Leeds, and a careful inquirer—in a work published by him in 1800, "On the Nature and Properties of Wool," estimated the number of sheep in England and Wales at 26,147,763, and the quantity of wool produced annually at 94,376,640 lbs. weight. The late Mr. James Hubbard revised this estimate in 1828 for a committee of the House of Lords, with the aid of Sir George Goodman, both of those gentlemen being wool merchants in Leeds, and they raised the quantity of wool to 111,160,560 lbs. Professor Low, in his able work "On the Domesticated Animals of the British Islands," published in 1845, estimates the number of sheep in the British Islands at 35,000,000, and the

produce of wool at 157,500,000 lbs. Mr. T. Southey, wool-broker, in a little work published in 1856, judging from the information he received from wool merchants in Leeds, Bradford, and other places, raised the estimate to 228,950,000 lbs.; and then, by an unreliable mode of calculating, even carried it to the enormous figure of 275,000,000 lbs. weight.

The balance of authority, Mr. Baines states, disposes him to conclude that the annual produce of domestic wool must be between 150,000,000 and 200,000,000 lbs. We believe, from our own investigations, it comes fully up to the latter figure. If we take, however, the medium, viz., 175,000,000 lbs., at 1s. 3d. per lb., which is about the average price of the last thirty years, the value of this great raw material produced at home will be £10,937,500. The exports of English wool, both in the raw state and in the first stage of consumption, namely yarn, are great, and rapidly increasing. In 1857 the exports were 15,000,000 lbs. of raw wool, and 24,654,000 lbs. of yarn; and the total value of the woollen and worsted exports in that year was £13,645,000.

According to the estimates of Mr. Baines, which are by no means overrated, it would appear that the following is about the annual value of the woollen manufacture of the kingdom, separate from the worsted manufacture: The raw material used consists of 76,000,000 lbs. of foreign and colonial wool, valued at £4,717,492; 80,000,000 lbs. of British wool, at 1s. 3d. per lb., £5,000,000; 30,000,000 lbs. of shoddy or soft materials, such as stockings, flannels, &c., torn up to be re-worked, at 2½d. per lb., and 15,000,000 lbs. of mungo, the shreds and rags of woollen cloth, at 4½d. per lb.—together £609,370; cotton and other warps used in the union and mixed cloths, £206,537; dye-stuffs, oil, and soap, £1,500,000; wages—150,000 workpeople, at 12s. 6d. per week, £4,875,000; rent, wear and tear of machinery, repairs, coal, interest on capital, and profit 20 per cent. on above, £3,381,680; which gives a total of £20,290,079 for the woollen manufacture.

The worsted manufacture consumes 80,000,000 lbs. of British wool, and 15,000,000 lbs. of foreign and colonial wool, and employs 125,000 hands, making in all 275,000 operatives engaged on wool. The total number of persons directly dependent upon these trades may be set down at 837,500 (including the workmen), there being a larger number of dependent workers in auxiliary trades than in connection with any other manufacture.

These details will serve in some degree to point out the real magnitude and value of the woollen manufactures, which have hitherto been most imperfectly known. They have hitherto either been most ridiculously exaggerated or wofully underrated. Let no one hereafter despise wool in a pastoral country like Great Britain, and whose colonies now produce immense supplies; which supplies are advancing in a most remarkable and satisfactory rate. We know the amount of manufactured goods exported, but we have no guide to the amount consumed by our own large and flourishing population in these islands. This some of our most experienced merchants, however, estimate to be three-fourths of the whole manufacture.

THE PUPIL SYSTEM.

Well done, Mr. Bond! The first paper read before the Farmers' Club was a good production; the second furnished the results of an extended and accurate observation in a most convincing way; while the third, if it does want a little more definitiveness in its suggestions, surpasses the rest in boldly, honestly, and affectionately dealing with a very delicate subject. From its commencement to its close we read it with one unfeigned feeling of admiration—admiration, not, as we said before, so much for the completeness of its suggestions with regard to the character of agricultural education, as for its spirited advice towards the formation of better habits than characterize the majority of those now learning or commencing the business of farming.

Whatever may have been thought of Mr. Bond's paper by those members of the Club who happened to hear it—and, judging from the discussion which followed, the feeling excited did not seem to be very strong in its favour—we are certain that its value will be felt throughout the country, and its results will become apparent in many a social circle. It is hard to say where such seed, dropped in due season, will not take root. The course of a life has not unfrequently been turned from indifference to earnestness by a mere word, a casual remark; and viewed only as the utterance of a strong heart in solitude to many another heart, the value of Mr. Bond's effort to arouse young farmers, actual and expectant, to a true sense of their duty, cannot be over-estimated.

Conscience, it is true, is a guide to man: it is a positive indicator to the great truths of God's moral universe; but beyond this, one man's conscience appears to be no guide for another—there seems to be, in fact, no possibility of a universal creed. While, however, this is the case, there are not many standards of right; for there can only be one standard of right, and the differences in opinion with regard to it will depend upon the different media through which we view it, be they dark, hazy, or clear. When a man ceases to think, becomes inactive, and is alive alone to his own enjoyment, he falls away into bad habits less from inclination than from the want of inclination. Content with securing their own comfort, our young men have allowed the Spirit of Indifference to place his seal upon their noblest faculties; and during this fatal slumber they are in danger, like Samson in the lap of Delilah, of being shorn of their strength. The clarion voice of warning has gone forth, and we doubt not its effect will be felt far and near.

So far as we know of the young men of the present day, the description given by Mr. Bond, and which we subjoin, is most faithful: "More than half the young men destined for agriculture in England actually waste, and worse than waste, the first four or five years of their freedom from scholastic restraint. Theirs is a thorough desultory life; they throw up all intellectual culture, and they have no intellectual standard of attainment at which to aim. They probably assist in the farm manage-

ment; but, as they have no responsibility, the farm occupies but little of their thoughts. As they feel but little interest, they observe but little; and the rat-hunt, the cricket-match, a run with the hounds, the quadrille party, the shooting exploit, with other amusements, combined with a profusion of tobacco, are their real employments—their true business of thought and occupation. How are the evenings spent? Often in a desultory do-nothing industry; or in card-playing and smoking—in colouring a clay or an idolized meerschaum; or, if in literature, in perusing some trashy love-tale, in studying *Blaine's Encyclopædia of Rural Sports*, or in reading the last number of the *London Journal*."

Is this the sort of discipline likely to produce good men of business? If it is true—and we sincerely think it to be so—that farming requires, in those who pursue it for a livelihood, acquirements perhaps more varied and deep than those which are required by members of either of the three learned professions, surely this training must be strangely at fault. So far as our own experience of pupil life is concerned, and so far as our own observations of pupil life in many different places goes, we are of opinion that it is a great farce, and that the £100 or £200 lodged annually with farmers for the education of young men to the farming business might as well be invested in any of the hundred-and-one bubble schemes which annually burst upon the shores of commerce. We do not say that this need be the case; but, speaking generally, it is the case. There is such an absolute want of system in the training of young men upon a farm, that a mortifying result may be safely predicted. A young man must be very self-reliant—he must have fixed plans, he must be determinately bent upon success, if he is to receive any good where there is no discipline—where there is no inducement to study, and perhaps but little inducement to attend to business either.

Now it is scarcely to be expected that a boy should leave school with such a strong sense of duty as shall carry him unswervingly through these temptations to indolence upon the right hand and the left. We generally conclude upon what will be, by what has been: certain causes are known to produce certain effects; and we ask our readers, therefore, whether they think an escape from discipline, and an introduction to a life of physical and mental indolence, is likely in the youth of sixteen to nourish and develop the germs of a vigorous manhood?

But the fault does not lie with the pupils—it lies with those who receive pupils. Generally speaking they recognize very little the responsibility which attaches to their position—they only see so much added to their yearly income. In nine cases out of ten they are in no way competent to fulfil the duties they undertake, and care very little in what way the youths under their care employ their time. To be perpetually questioned as to

the why and wherefore is "a bore"—science is "bosh"—and reading is "book farming." Even those who would not discourage attention to science, &c., do not possess, usually, that intimacy with it to enable them to direct their studies, and thus assume a very superior position to their pupils. Of course we speak generally; for there are to our own knowledge gentlemen who perform the duty they undertake with scrupulous care and

great efficiency, and whose praises are upon the lips of all who have been so fortunate as to have received instruction from them. But it is the knowledge of these few model teachers which causes us so much dissatisfaction with the many, the very many inferior ones.

Mr. Bond has done signal service in opening up this subject, and we hope it may not be dropped until some good remedial measures are struck out.

THE MORALITY OF TRADE.

There is nothing, it is said, of which we eat or drink, that does not undergo some species of adulteration, whereby a wholesome and nutritious article is often made more or less poisonous: every thing that the hand of fraud can touch is tampered with. Without admitting these assertions to their full extent, it cannot be denied that gross frauds are continually committed, both here and elsewhere, on the public, and that the morality of trade is at a very low ebb. The object of Mr. Scholefield's Bill on the Adulteration of Food and Drinks, is to put an end to many of these frauds, and to afford a security for the health and pocket of the public. The Law Courts are continually occupied with cases of palpable frauds: witness the case of the surreptitious use of one man's casks and repute, to further the sale of a totally different compound.

Professor Levi, of King's College, who is well known for his labours in the department of Commercial Law, recently in a paper at the Society of Arts, upon the fraudulent use of trade-marks, gave some glaring instances of the unscrupulousness of home and foreign pirates, who avail themselves of every means of filching the character, reputation, and symbols of others, to further their own interested and unprincipled views. The paper, however, dealt chiefly with articles of manufacture capable of bearing a trade-mark; and it was recommended that there should be a public register of trade-marks, where manufacturers should be able to enter their stamps, marks, or labels, and the imitation or illegal use of which should be felony. Sir Richard Bethell, who presided, also threw out some very valuable and practical suggestions.

Without going into the consideration of the fraudulent imitation of our manufactures, so extensively carried on by unscrupulous foreigners, or entering upon the question here of pirated trade-marks and the foisting of much inferior trash upon the public under deceptive cloaks, a few words upon the frequent adulteration of articles in which our readers are more immediately interested may not be out of place. We have never read, "What to Eat, Drink, and Avoid;" but if the author is a man of sense, judging by the prejudiced outcry against all articles, we should think he has excluded every thing but potatoes and distilled water. Some of our readers may remember when Mr. Accum published a work, which he chose to call "Death in the Pot." Everybody was dreadfully alarmed, and felt disposed to leave off eating if possible. A death's-

head and cross-bones shadowed themselves forth on every platter and in every tureen. Frying-pan, grid-iron, oven proper and Dutch-oven were regarded as the lurking-places of death, as well as "the pot." Since then we have had medical inquiries, analytical commissions, Parliamentary committees, and microscopic examinations and works by the dozen, exposing frauds and falsifications. And much good all these have certainly done by putting customers on their guard, and warning purveyors and dealers that their proceedings were suspected and investigated.

We have little to complain of, in the ingredients of our daily bread in London, especially if we patronize a "full-price" baker. In the country, however, we fear there is much adulteration carried on—some harmless, as the admixture of rice flour and Indian corn meal; others positively injurious. Bean meal is largely used as an ingredient. We have ourselves bought a very fine quality which is commonly vended at Birmingham. Mr. Postgate, a scientific chemist in that town, states that bean meal is regularly mixed with wheat flour in the proportion of one sack of the former to fifteen of the latter. Bean meal may be detected by the smell, on pouring boiling water on the flour. But flour is also adulterated with chalk, gypsum, and China clay. All these may be detected by burning a small quantity of the flour entirely away, when the mineral substance will remain unconsumed. A miller and flour-dealer at Rotherham was convicted, a few years ago, of adulterating flour with gypsum in the proportion of 4 per cent. At Lincoln, a dealer was convicted on two charges of having a quantity of sulphate of lime upon his premises, and of having mixed it with flour intended for human food. Two millers were also recently convicted at Leeds, in the penalty of £20, for having adulterated flour in their possession, which on analysis was found to contain oil of vitriol and oxide of iron. Chalk may be easily detected by mixing a teaspoonful of flour in half a wine-glass of cold water, and adding twenty or more drops of muriatic acid, when the chalk will betray itself by effervescence. Potatoes are also used in bread, chiefly to improve the texture. If much is put in, the taste betrays it; but a little good mashed potato rather improves the bread than otherwise.

There are numerous dealers in flour and mill offal in the Canadian towns—Quebec, Montreal, Kingston, Coburg, Toronto, and Hamilton, whose business it is

to buy up the empty barrels of such millers as are considered the manufacturers of the best qualities of flour. Into these barrels, with the original mill brand upon them, is packed flour of the most inferior quality they can purchase; and it is quite probable that these same disreputable dealers, when the price of flour is high, are tempted to adulterate it. In many of the barrels at least half a bushel of gypsum has been found. The wharfingers of the port of Toronto could testify to the truth of this statement, for large quantities of what is known as inferior farmers' flour is bought up and packed in storehouses, and no doubt elsewhere throughout the city. Whether this is all locally consumed in the province, or some portion exported, it is perhaps difficult to ascertain.

Half the starches vended under the names of Bermuda and St. Vincent arrowroots, German sago, &c., are nothing but potato flour. And so with the mannakroup, semolina, and other fancy-named food products: these are simply ground wheat. There is no absolute harm inflicted in these, except the imposition. But some of the condiments sold are positively hurtful. There are, however, conventional adulterations carried on, to please the eye and the taste of the customer. Thus mustard is never to be found genuine. What is sold in the shops is white mustard, and not brown, as it should be, and this is mixed with a quantity of flour. Turmeric is added to bring up the colour, and pungency is given by the addition of a little pepper or ginger. Brown mustard flour after being mixed twenty-four hours turns black; and people do not like it. Pure mustard flour if tested with a single drop of spirits of ammonia retains its colour unchanged, whereas that adulterated turns red.

Provisions derived from the animal kingdom are not very easily adulterated, but still they are tampered with to some extent.

A correspondent of *The Times*, not long ago, gave the following account of how provisions for the Navy are manufactured:—"Passing through a district of Ireland, my attention was directed to a particular occupation carried on, which, upon nearer inspection, proved to be the following highly amusing and instructive one. A number of persons were sewing pieces of meat together, and, when united, they formed a square mass of the weight of about 4lbs. It appears that the contract by Government is to supply the Navy with pieces of this size, and to meet the demand the trade resort to this ingenious mode of answering to the tender. Sailors are well acquainted with the fact, for during mess you may frequently see them spinning a yarn. Of course, bad meat gets stitched up with the good, necks are shaped into back loins, and every portion of the carcase finds itself elegantly converted into a four-pound piece. Sailors can do without the thread, but the Admiralty can't without the stitching; for everything connected with the Board wants mending—except the meat, and this would be just as well without the above process of repair."

Lard is even adulterated before shipment, in America.

Indian corn-meal was formerly used for the purpose; but that discoloured the lard, and flour was found to be preferable, as it assimilates so closely to the genuine article as not to be detected by inspection. A test was recently applied to a lot sold by a Boston dealer, and the lard was subjected to the fire, when, lo, the owner had not only a pan of lard, but also a good-sized pancake nearly fried in the boiling fat!

Only conceive a *genuine* from the country where wooden nutmegs are natives of the soil, and wooden shoe-pegs are whittled into oats, taking home with him such a mixture! A Yankee is, however, never at a loss; and we have no doubt that a descendant of the man who made such a speculation by shipping warming-pans to the West Indies, and turning them to good account as sugar-ladles, will invent a new system of selling doughnuts, all ready to be fried upon the application of a Lucifer-match, out of this doubtful investment.

It is stated that frauds of a character similar to those recently detected in the wine business in the docks have transpired in the hop trade. They have consisted in refilling of empty packages stamped with the names of well-known planters, whose growths are of choice character, with inferior, and indeed almost worthless hops, chiefly the lowest description of American.

The husks of rice and the refuse of rice-mills, under the name of shude, is largely sold to oil-crushers to mix with linseed-cake, to the extent of 30 per cent. and upwards; and, as it is perfectly tasteless, and yields no nourishment, it is of course a palpable fraud on the purchaser, who pays a high price for what he deems genuine oilcake for fattening his stock.

Agricultural improvement is also much retarded by the adulteration of inert substances with fertilisers. Artificial manures are now employed to an enormous extent, and it is but right that the purchaser should get his money's worth in the receipt of an article which is what it professes to be. So systematically are many of the artificial manures adulterated, that many farmers hesitate to use them, and form unfavourable opinions as to their efficacy from the gross adulteration practised. Many of the guanos sold as Peruvian at £12 per ton have been found, on analysis, not to be worth £2 or £3. Earth adds to the weight of guano, which ought not to weigh more than 70 or 72lbs. the bushel. Water, again, is frequently unscrupulously added. Guano ought not to lose more than 10 to 16 per cent. by drying.

Gypsum is often added to guano and to ground bones, and common salt to nitre, sulphate of ammonia, &c. But there is no end to the catalogue of sophistications and adulterations practised, whether they come under the class of conventional, to suit the public taste and demand, or fraudulent, to put more money into the dealers' pockets. Steps should be taken to check practices rendering it almost impossible for the honest trader or dealer to compete fairly in business, and inimical to the health and interests of all classes of the community.

The folly of the age appears to be an anxiety to

purchase everything at a cheap rate, forgetting that in nine cases out of ten what is cheap must be bad. The inevitable result of this cheapening, bargain-seeking spirit is fraud and imposture. The evil produces its own infallible retribution. We should be wrong, there-

fore, if we relied upon legislation alone for a remedy which must originate with ourselves. Resolve to buy the best of everything, and to pay a fair price for it. Fraud will then soon be driven from the field, and honesty and fair trading will deservedly triumph.

THE BREED AND SHAPE OF A CART-HORSE.

"Agricultural societies are to be blamed very much for the little attention they pay to horses as compared with other stock, especially poultry. They ought to give liberal prizes to the best brood mares and stallions of all breeds, and pay as much attention to them—they deserve more—as to cattle. The best stallion should have to travel within the district of the society during next season, and not to receive the prize until the end of that time. I must add that our great landlords generally overlook the interest of their tenants, and consequently their own also, in not keeping good thoroughbred stallions, of different breeds, for the use of their tenants at a nominal charge. Farmers themselves also overlook their own interest too often by being 'penny wise and pound foolish,' in looking more at the fee of the horse, when they engage him, than at his shape." At the risk of being considered, perhaps, a little too "horsey" in our tone, we have continued to impress this now for many years past. It was too palpably a weak place to be passed over, and we commenced our strictures accordingly on those representative bodies which only appeared to the more neglect the evil as the greater it grew. It is not so very long since that the Royal Agricultural Society quite despaired of ever getting together a good show of horses, and so reduced its premiums proportionately! This section of the meeting has, however, gradually improved, by the adoption of an exactly contrary course. The prizes in the different classes of horses have been considerably extended, and as a consequence the entry is coming to be a highly creditable one. It is, indeed, by this, one of the chief attractions of the occasion.

We have very recently dwelt on the demand for good riding stock, and the more than indifference with which the farmers have prepared to meet it. There may be some showing for this. Many steady-going people have a positive dread of galloping horses, while the outlay they think would be hardly warranted by the hazard and uncertainty of the business. A man, then, might be a little careless as to how he bred his one hackney-colt or so. But the most extraordinary thing is that, as a rule, he scarcely takes any more trouble with his cart-horses. The observations we have quoted at the opening of this article are taken from a paper recently read to the members of the Much Wenlock Farmers' Club, on the principles which should guide the farmer in breeding stock. We give this in full in another place. Mr. Griffith Evans, its author, adverts more particularly to the breeding of horses, and especially to those intended for agricultural purposes. He includes in his "blame," certainly, the little atten-

tion that is given either by our societies, landlords, or tenants to horses of all kinds; but the emphasis of this complaint rests on the culpable carelessness with which the farmer treats the breeding of farm-horses. Mr. Evans stands by no means alone here. Many gentlemen have said this before now, and some almost in the same words. Mr. Barthropp, for instance, so deservedly famous for his Suffolk, expressed his regret at the Central Club a few years since, that "farmers did not pay more attention in selecting horses for their mares, instead, as is too often the case, pursuing that penny-wise-pound-foolish system of putting all their mares to one horse, perhaps an inferior animal, merely for the sake of saving trouble and a little expense. They did not take into consideration the relative form of the mare and the horse, or judge whether they suited each other—a want of system almost certain to result in disappointment." It is noticeable that in condemning this ill-considered economy Mr. Evans and Mr. Barthropp both make use of the same phrase, and characterise it, justly enough, as "penny wise and pound foolish."

Although we already hear of agriculturists who, thanks to Mr. Smith or Mr. Fowler, have reduced their teams to at least one-half their previous strength, a clever cart colt will always command his price in the market. Railways have not even yet put machiners and hunters quite out of date, and the draught-horse will ever have his uses. Notwithstanding, moreover, the too common neglect he has experienced, we have wonderfully improved in our estimate of what a cart-horse should be. By this we may be considered to have altogether outlived our veneration for the old orthodox Blackbird sort, with his halcy heels, his sour head, his upright shoulder, and sluggish pace. We combine strength with activity; and whether it be the Lincoln, the Suffolk, or the Clydesdale, we must have something that can not merely pull, but step. And here we are rather inclined to join issue with Mr. Evans. It appears that so far back as the year 1836, a writer in "that excellent journal" the *Farmer's Magazine*, advocated the same oblique shoulder for the draught as for the hackney horse. This Mr. Evans terms "a most ignorantly absurd and grossly fallacious doctrine." And he goes on to say "the proper shape of the draught horse, in contradistinction to the saddle horse, should be a low and thick forehead and withers. The shoulder should be comparatively upright, and consequently the line drawn vertically from the point of the shoulder will fall considerably in front of the toe. The draught horse should, as the saying is, 'stand over his legs,'

and you now see that what is an excellent point in one horse is the worst that can be for another." It is true this opinion, in contradiction to the ignorance and absurdity of the *Farmer's Magazine*, is carefully qualified by the phrase "comparatively;" but we should be really loath to pass it on any terms. About the best pace to judge of a horse by, for almost any purpose, is to "give him his head, and let him walk." To either race-horse, hack, or hunter, it is a point of immense importance; while to the cart-horse it is everything. Can any animal, we would ask, with an upright shoulder really walk? Has he any proper liberty of action to enable him to do so? How could the old Blackbirds walk, *comparatively*, with our Clydesdales and Suffolks? And have the latter upright shoulders? Such a formation would be utterly incompatible with the fine action of the Clydes, while the first prize cart stallion at the national show at Chester had a shoulder lying almost as well back as that of a race-horse. This upright shoulder and standing over might possibly tell a little at starting,* but we certainly share the doubts of the chairman at Wenlock as to the power of endurance in a horse so formed, and whether he would not in all probability topple over on his knees long before he arrived at his journey's end. The orator said, the great secret of his art was "*Action, action, action*;" and we say the same of the horse. What can be the use of a brute, let him be ever so big or heavy, that can hardly put one foot before another, and certainly not put it out?

Let us not, however, be content with either our own authority or that of Mr. Evans. One of the very best judges of a cart-horse we have, and with his ability backed by immense experience, is Mr. Spooner, of Eling, near Southampton. Here is his reading of the same points:—"The fore-arm should be strong and muscular, and should not stand too much under the

body; for although this is not of the same importance as with other horses, yet it is extremely desirable. So likewise with regard to the shoulders, they should be tolerably oblique; for when the shoulders are good, the horse is likely to be a good walker." Putting Mr. Spooner's "tolerably" against Mr. Evans's "comparatively," we have one declaring for an oblique shoulder and the other for an upright one. So much does Mr. Spooner attach to the action of the cart-horse, that he has, ere now, recommended it to the Council of the Royal Agricultural Society as one of the *testing* points the Judges should decide. He would have a certain distance measured out, and then see which did it in the best time and best style. The upright shoulders would not tell much here. The only authority, indeed, we have come across of late, who might agree with Mr. Evans, is a poet in a recent number of one of the metropolitan magazines, who, in describing the qualities of his fiery steed, proudly declares "he could do anything but walk;" and a nice brute he must have been.

There is much able matter in this paper, and we call attention to it the more strongly as it touches on a subject still thought too little of. Fortunately the means of a remedy are far more accessible than they were a few years since. The increased attention given to this department of their duties by our agricultural associations has tended to the better appreciation of a better sort of a horse; and the Suffolk, the Shire, and the Clydesdale are all deservedly rising in repute. But we must repeat, that one of the first of the merits of these is their fine action. A horse now, for any purpose, must be a good mover; and if, as Mr. Evans maintains, we must keep to a *thorough-bred* kind of cart-horse, we do not recommend an upright shoulder as one of his points. "Comparatively," our leaning would be all the other way.

THE PRINCIPLES THAT SHOULD GUIDE THE FARMER IN BREEDING STOCK, WITH MORE ESPECIAL REFERENCE TO HORSES.

A quarterly meeting of the members of the Wenlock Farmers' Club was recently held, at the Raven Hotel, Much Wenlock, to hear Mr. Griffith Evans, M.R.C.V.S., &c., of Bridgnorth, deliver a lecture upon "The principles that should guide the farmers in breeding stock, with more especial reference to horses." There was a tolerably numerous attendance, considering that the assizes were being held that day in Shrewsbury.

* The author of the article in this Magazine disputes any such advantage even for a dead pull:—"If we notice a draught horse exerting himself at a dead pull, we shall find that he will sometimes lift his fore-feet entirely from the ground, and that, too, when he is evidently applying the utmost of his force to the collar. In such case, it is clear, the upright shoulder could add nothing to the horizontal pressure, or the application of the animal's strength in drawing. When the shoulder of the draught horse is straight or upright, in the act of drawing, the pressure against the collar is spread over a more extensive surface, and consequently rendered less effective than when, by the obliquity of the same part, it is more concentrated, and therefore more directly applied to the

In the absence of the President, M. G. Benson, Esq., the Rev. H. R. Smythies was called to the chair. There were present: S. Meire, Esq.; J. Meire, Esq.; H. Smith, Esq.; B. B. Fowler, Esq.; W. P. Brookes, Esq.; Mr. C. Wadlow; Mr. J. Wadlow; Mr. Ainsworth; T. Colley, Esq.; R. Colley, Esq.; Mr. Lewis; Mr. Horton; W. Thursfield, Esq.; Mr. R. Davis; Mr. E. Davies, &c.

The CHAIRMAN, in opening the business of the meeting,

purpose. Let us have a broad full bosom or breast in the cart horse, with a corresponding development of the lower part of the shoulder; but, in the name of all that is reasonable, let the latter present that obliquity indispensable to safety in the saddle, and equally desirable for the collar. Nothing can be more dangerous than to put an upright-shouldered horse in the shafts of a cart, since he must be liable to fall at every step; even without the slightest weight on his back, such a horse is a very unsafe goer, because his formation prevents him from lifting his fore-feet sufficiently high; but when the effect of external weight or pressure is added to that of the malformation of the shoulder, the danger is doubly increased."

said: I regret there is not a larger attendance, which is, no doubt, owing to the assizes being opened at Shrewsbury this day, which deprives us of our president and several influential members. We are met here, as the circular has informed you, to hear a lecture from Mr. Evans on the principles that should guide the farmer in breeding stock, having more especial reference to horses, a most important subject you will admit; and I have no doubt, from the experience we have had of Mr. Evans's lecturing powers, that the subject will receive at his hands the elucidation which its importance deserves. I therefore beg to introduce Mr. Evans to your notice.

The lecturer began by contrasting the present Shropshire-down sheep with their ancestors thirty years ago, and he showed how that the great improvement had been made by breeding upon some scientific principles. Yet he was persuaded that many follow the new system who are not acquainted with the principles. They do it because it is the fashion, and answers the purpose better—not knowing the why and the wherefore it should answer better. He should therefore draw their attention to Nature's laws of breeding. The same law is applicable to all animals, only, of course, requiring certain modifications which their good sense might easily direct. It is a lamentable fact that horse-breeding is very much neglected throughout the country, especially hunters and carriage horses; nor has the draught horse had the attention he deserves. He (Mr. Evans) should, therefore, more especially point out how to apply the principles of breeding to horses than to other animals. Mr. Robert Smith, in his excellent "Report on the Exhibition of Live Stock at Chester," published in the last volume of the *Royal Agricultural Society's Journal*, says that "The breeding of the horse is a national subject, but as yet has not been treated as such. There is a want of system in our arrangement and management." He quite agreed with Mr. Smith. Our fairs are overstocked with horses, but so shapeless that it is difficult to say for what purpose most of them are adapted. He thought he might safely say that the average value of four-fifths of our four-year-old horses, of all sorts that we see in the fairs, is hardly £20 to £25, and it is difficult to sell many of them at any price. Now, taking into consideration their cost of breeding and rearing, with all risks and so on, no wonder, then, breeders say they do not pay. The average value of the remaining one-fifth it is difficult to say; but they sell readily for from £40 up to almost any amount you can reasonably conceive. Now, I ask those breeders who complain, why do they breed horses at all? "Oh," they say, "to consume the grass properly we must have cattle, sheep, and horses too—they all differ in their bite so." Very well, then, if you breed horses of some sort, why won't you breed good ones? Does an ill-shaped horse consume less food than a good one? Is it cheaper to breed poor than good horses? My motto is this always: "If it is worth my while to do a thing at all, it is worth my while to do it as well as I possibly can;" and I have no hesitation at all in saying that it would pay you as well as anything to breed real good horses. Some of you may perhaps say, as I have heard others say, that in breeding cattle and sheep you are seldom disappointed; the progeny is always what you expected; while in breeding horses you have no idea what the colour or shape of the colt will be until you see it, it is quite a lottery. It may be this: it may be that. You hope the best, and the worst will not disappoint you; for you do not believe in horse-flesh. Thank you, my dear friend, that is a candid confession at any rate, which goes

so far as to prove that you have never practised horse-breeding upon right principles. Before I came here I lived in Lincolnshire. There, good horses are comparatively plentiful; much better than those bred in Shropshire, taking all together. You excel in sheep; I wish you to excel in horses too I wish to see dealers flocking from all parts of the world to Shropshire for horses. I wish to see the tide turned from Lincoln and Horncastle fairs to Shrewsbury and Bridgnorth; or, at any rate, to see the trade as strong here as there. It is not impossible; the country is naturally well adapted for breeding purposes; you only want the system. Don't despair, a patient perseverance will overcome all difficulties. Let us all then, this evening, enter into the subject in good earnest, determined to sift the matter thoroughly, and to profit by the investigation. He went on to notice that the first great law of nature in breeding is, that like should produce like; if it was not for this law, which is constant and without exception, a mare might produce a calf, a sow produce a dog, a bitch produce a lamb, &c.; but it must be accompanied in our mind with another law, the law of variation. The child is not always like its parent in every respect, and sometimes not like its species, as when a lamb has two heads or six legs, &c., as we often find. Then we call it a monster. This diversity forms the problem of hereditary influence, and it is for the causes of, and reasons for, the variation that the breeder must enquire, and make himself acquainted with, so that he may, as far as possible, modify them. One of the causes of variation is what is called "breeding back." It is often a source of disappointment to the breeder that when he gets a well-formed female and a well-formed male, he gets an ill-formed colt or calf, and of quite a different colour to what he expected. If you enquire into the pedigree of the parents you will find the child answering in every respect to the description of an ancestor. This is the law of atavism. It is this that makes many say that horse-breeding is a lottery. However, if you breed properly you have little to fear. Pure and thoroughbred animals comparatively seldom breed back, or, however, disappoint their owners in doing so. By thoroughbred is meant those whose ancestors were for a long time of the same shape, and adapted for the same purpose as themselves. The more the animals have been crossed the more subject are they to breed back, and more the difference of shape in crossing the more likely is breeding back to prove a disappointment. A case was related to illustrate this law. How is it to be explained? The "Westminster Review" very properly says, "It is to be explained on the supposition that the qualities were transmitted from the grandfather to the father (the other sex may convey it equally well), in whom they remain latent or were marked by the presence of some antagonistic on controlling influence, and thence transmitted to the son, in whom the antagonistic influence being withdrawn they manifest themselves. Mr. Singer, let us say, has a remarkable aptitude for music, but the influence of Mrs. Singer is such that the children, inheriting her imperfect ear, manifest no musical talent whatever. These children, however, have inherited the disposition of their father in spite of its non-manifestation; and if, when they transmit what in them is latent, the influence of their wives is favourable, the grandchildren may turn out musically gifted. In the same way consumption or insanity and other hereditary diseases seem to lie dormant for a generation or more, and in the next flashes out with the same fury as of old." This should make you very careful in breeding stock, and to ascertain that not only the sire and dam are free from spavin, curbs, &c., but that their ancestors were not subject to any hereditary affection, add not only that they were free from hereditary evils, but that they possess the same good

qualities, and are adapted for the same purpose as themselves. Several very beautiful, instructive, and interesting illustrations were produced to prove that diseases arising from accident, as well as constitutional idiosyncrasy, curious tricks, acquired habits, vicious and peevish tempers, as well as good tempers, &c., were hereditary, or transmissible from parent to offspring. Now comes the vexed question, "Which has the predominating influence on the progeny, the male or the female parent? If both parents join to form the child, does one parent give one group of organs and the other parent another group; or do both give all?" This subject is so very interesting, and it is so important, that the breeder should come to some definite conclusion upon it, that he felt justified in occupying a considerable part of their time in its investigation. Several great men were mentioned who maintain that the male parent furnishes the external configuration, or, in other words, the locomotive organs; while the female parent gives the internal or vital organs, each absolutely independent of the other. Other equally celebrated observers declare that it is quite the reverse, the female preponderates always in the locomotive organs, and the male in the vital organs. Others again, equally as eminent, assert that both theories are wrong; that the male always gives external configuration or locomotive organs, and the female the internal or vital organs, but do not mean it to be inferred that either parent gives either set of organs uninfluenced by the other parent, but merely that the leading characteristics and qualities of both sets of qualities are due to the male on the one side and to the female on the other, the opposite parent modifying them only. He (Mr. Evans) believed they were all wrong—that the truth lies between them. He related many very beautiful and interesting facts in support of each theory, which seemed conclusive in themselves; but he maintained it was not fair to look at one set of facts alone, and shut our eyes to others. It was by an impartial survey of them all that we get the truth. There was an able article upon this subject in the *Westminster Review*, with which he fully agreed, which says "That both parents are always represented in the offspring; and although the male influence is sometimes seen to predominate in one direction, and the female influence in another, yet this direction is by no means constant, is often reversed, and admits of no absolute reduction to a known formula. We cannot say absolutely, the male give such organs; we cannot even say the male always predominates in such or such a direction. Both give all organs. Sometimes one predominates, sometimes the other. In one family we see children resembling the father, children resembling the mother, and children resembling both." He (Mr. Evans) knew many breeders who had suffered great disappointments and losses by practising upon the theory that the female does not give the external configuration, nor has any part in the locomotive organs. One of the greatest curses in horse breeding is that there are but few good brood mares kept. He had no hesitation in saying that, as a general rule, and the only safe one to go by, the female has as much influence on the configuration of the progeny as the male has. The successful breeder never uses a middling female to breed from, trusting to the excellency of the male to make amends. If he has not a good female he will not attempt to breed. Seeing, then, that there is a diversity, that sometimes the influence of the male parent predominates, and sometimes the females, in each system of organs, let us inquire into the causes. Several illustrations were brought forward to prove that it depended upon potency of race, upon the vigour, health, and age of the parents at the time of copulation. The most potent or

vigorous parent will have the greatest influence upon the offspring. The lecturer said, I shall now pass on to notice more particularly the practical application of these laws. It is a common but silly question, "Which breed of animals is the best for the farmer?" Some advocate short-horns, others advocate the long-horns, others the medium-horns, and others will have no horns at all. A particular kind is sometimes advocated under all circumstances to the exclusion of all others. Such persons remind me of those disputants about the true colour of the chameleon; all are right, and all are wrong, depending upon the point from which the object is examined. That breed of animals is the most profitable which is better adapted to that particular locality. One class do better on upland, others on lowland; some do better grassing, others do better housed. It also depends upon the demand of the neighbouring markets. In some parts cheese-making pays best; in other parts milk; in other parts meat, &c. In some districts it pays better to breed draught horses, in others hackneys and hunters, in others racehorses, in others ponies, &c. What I wish to impress deeply upon your mind is this: Every breed has its own peculiar conformation, and that conformation you will find, upon close investigation, to be peculiarly well adapted for a particular purpose; and when you adopt and cultivate a certain breed, you must always keep that purpose and that conformation steadily in view. If you lose the conformation, you will soon lose the purpose. For instance, we may divide cattle into two primary classes: 1, For fattening and arriving at early maturity; 2, For dairy purposes. For illustration, take two cows, one from each class, and you will find their shape or conformation diametrically opposed. Go to any herd you please, and you will find that just in proportion as the animals represent the shape of class 1 so are they disposed to fatten; and in the proportion they represent class 2 are they fit for dairy purposes. These classes may again each be divided into different divisions: A is better adapted for high land; B is better adapted to low land; C is better adapted for outdoor living; D is better adapted for living in-doors, and so on. Each division has its own distinct peculiarity of external conformation. That enables us to say at once which will do here, and which will do there. It is all-important that the breeder should be thoroughly acquainted with these "points," or proper shape of his stock; but I should depart from my subject if I discussed them this evening. However, I know many farmers who think that there is only one proper shape for the horse—draught horses, hackneys, hunters, racers, all should be the same outline. They take the hunter as a standard of comparison, and the only proper difference they allow between him and others is not in the shape, but in the weight and bulk of bone and muscle within the same height and length. The race-horse should be more slender and finer, and the cart-horse stouter and more hairy. As I know that such a notion exists, you will permit me to say a few words to show its absurdity. It is surprising how few farmers know the proper points of a horse; and many of the "knowing ones," in fact, know less than nothing. In that excellent journal, the *Farmer's Magazine*, for October, 1836, there is an article upon the cart-horse, advocating the same oblique shoulder for the draught and for the hackney-horse, which is certainly a most ignorantly absurd and grossly fallacious doctrine. We may also divide horses into two primary classes: to carry weights on the back, and go fast; and to draw weights after them. It is evident that they are destined for very different purposes, and must set to work in a very different manner. The first-class has to carry the rider safe at a fast rate. For this purpose the fore-legs ought to reach over much

ground when in motion, and the saddle should be so set that it will not interfere with the motion of the shoulders; and the weight should be so carried that it will not balance over the fore-legs, and make him tumble forward. The chief points to attain this are, that the withers and forehead should be high and thin. The shoulders should have much obliquity from the top to the point, and a line drawn vertically from this point should drop at the toe when the animal stands in his natural position. The second-class has to pull heavy weights at a slow rate, therefore, its shape should be quite the contrary to the first-class. The animal should be able to throw its whole weight into the collar, and to overbalance its centre of gravity, so that it has to step forward to avoid coming down. When the hackney or saddle-horse is in the collar he cannot pull a weight beyond the power of its hind-quarters. The shape of its fore-quarters rather prevents than help him to pull; while the draught-horse, by the peculiar shape of his fore-parts, is able to throw his whole weight into the collar to assist the muscles of the hinder-parts. It is common with waggoners, when a horse is not able to pull or start a load, to jump on his neck or withers, and by the weight overbalancing him, the load starts easily. The proper shape of the draught-horse, in contradistinction to the saddle-horse, then, should be a low and thick fore-hand and withers. The shoulder should be comparatively upright, and consequently the line drawn vertically from the point of the shoulder will fall considerably in front of the toe. The draught-horse should, as the saying is, "stand over his legs," and you now see that what is an excellent point in one horse is the worst that can be for another. Class 1 may be divided into—A, the race-horse for galloping; B, hunters, for galloping across country, and jumping, &c.; C, hackneys, for trotting and cantering on the road. Class 2 may also be divided into—A, the town dray-horse; B, the farm draught-horse (both pull heavy weights and go comparatively slow); C, the carriage-horse (he goes on the road, pulls heavy weight, and must go fast, therefore in many respects his shape should approach the saddle-horse). I have already said that I should be out of place in dwelling upon the proper shape of animals—it would form a subject for an interesting lecture of itself. I now merely draw your attention to the fact that there is a peculiar shape adapted to perform any particular work, and it is essential that the young man should make himself thoroughly acquainted with those before he can expect to be a successful breeder. Starting then upon the great law of nature, that like produces like, and being prepared to guard against variations by breeding from animals of the same sort, &c., breeding good stock becomes a simple matter of course. First ascertain what animals your land is best adapted for. Secondly, what have the readiest sale in your markets. Thirdly, having decided upon the purpose of your animal, study the best shape and conformation calculated to attain your object in a most perfect manner; if you wish to breed fat stock, study the shape most disposed to lay on fat with the least food, and to arrive at early maturity; if you wish to breed milk cows, study the proper shapes for them; if you breed horses, study the proper shapes to perform their various duties. Fourthly, don't breed from an animal, whether male or female, whose shape is not well-adapted to perform the work it is intended for: let them be of the most perfect shape you can get of their kind. Fifthly, being acquainted with the law of atavism, or breeding back, you will not be satisfied unless their ancestors were also of the same sort, and equally good; in fact, thorough-bred, and free from hereditary evils. Remember that I do not confound the term thorough-bred to the race-horse. It may be equally well applied to the cart-horse, or hunter, or pony, or carriage-horse,

&c. It means those whose pedigree for a considerable time back were of the same class, and adapted for the same purpose as themselves. Unless you commence to establish a new breed, you should never breed from a half-bred animal. Let them all be castrated, and treat all such mares and geldings. There is too much risk connected with it; it is based upon a wrong principle; you should carry the right principle out thoroughly. Why should you breed from a half-bred mare more than from a half-bred cow? I know many excellent horses bred from half-bred mares, but there are many more failures. Some of you may say that you have no pure or thorough breeds, except racers; therefore, you ask how can you avoid crossing. Well, "It is never too late to mend." Suppose Messrs. Bakewell, Adney, Smith, and other eminent breeders, had listened to such an excuse? We never should have had the improved Leicester sheep, nor the improved Shropshire down. Though you may not have good distinct breeds of coach-horses, hackneys, &c., now, you may soon have by following the directions I lay down. Unless breeders will reform, that useful animal the hackney will soon become extinct. The present system of breeding hunters and coach-horses is a bad one; because by putting a race-horse to a half-bred mare you may get a good hunter, and you often fail; you may get a hack, you may get a useless one. By putting a hunting-horse to a Cleveland mare, you may get a carriage-horse, or you may often get a good for nothing. You have no law to depend upon. By breeding exclusively from animals of the same shape, and, therefore, adapted for the same purpose, with careful attention to pedigree, you may easily establish a breed for any purpose whatever. At first, when originating the breed of hunters and carriage-horses, of course we cannot avoid using crosses or half-bred animals, and such was the origin of the race-horse. They will soon bear the name thorough; and when, in after generations, a progeny will show the original cross, by breeding back, it must not on any account be used for breeding purposes. I should not recommend you to breed from your own stock exclusively, only as long as you cannot find a better male than your own, and your stock improves. I do not object to a cautious admixture of blood, but you must not cross the breed. I do not object crossing two families, but those families must be of the same breed. That word "breed" is very comprehensive, and has many different meanings. By those of the same breed I wish it to be understood those of the same shape and adapted for the same work, with good pedigree. They may or may not be related. For example, you must not breed between a thorough-bred draught-horse and a thorough-bred hunter or racer. You would get a good-for-nothing mongrel, too weak for draught, too ugly for harness, and not the shape for saddle; yet our fairs are overstocked with such animals, which prove that the present system of breeding is a wrong one. I can countenance no crossing of the breeds. Keep them distinct. Have thorough-bred draught-horses, thorough-bred hackneys, thorough-bred hunters, as well as thorough-bred racers. Each has its own peculiar shape, suitable for its particular purpose. Why should they be mixed? As to the qualities of the brood mare, there are some peculiarities essential for all breeds. She must be what is called roomy, allowing sufficient space to carry a foal, and for its passage into the world. For this purpose the carcass should be long, and the back ribs deep, the pelvis or hips should be wide and deep. The forehead is usually lower in the mare than in horses of the same kind. This, as Stonehenge observes, "gives the whole framework of the trunk a larger proportion than is always desirable in the race-horse, which may easily be overtopped; and here many good runners have failed as brood mares, whilst a good number of bad run-

ners have been dams of good race-horses. Beyond this roomy frame necessary as the eggshell of the foal, the mare only requires such a shape and make as is well adapted for the peculiar purpose she is intended for. It is better to breed from animals of a medium size of their kind, whether male or female, not too big, nor too small." To ensure the mare being stunted she should be perfectly healthy, and living as much as possible in a state of nature; not overfed with corn, but rather have cooling diet, unless she is poor. Fattened animals often prove barren. The best time for covering is when the heat commences. If convenient it is often recommended to do so a second time when the heat passes off. "Like the brood mare," says Stonehenge, "the stallion requires several essentials, commencing also, like her, 1st with his blood; 2ndly, his individual shape; 3rdly, his health; 4thly, his temper. But there is this difficulty in selecting the stallion, that he must not only be suitable, but he must also be adapted to the particular mare which he is to serve. Thus it will be manifest that the task is more difficult than the fixing upon a brood mare, because (leaving out of consideration all other points but blood) in the one case a mare only has to be chosen, which is of good blood, for her particular work; while in the other there must be the same attention paid to this particular, and also to the stallion's suitability to the mare, or to "hit" with her blood. The rock upon which most men split is a bigoted favouritism for some particular horse; thus one puts all his mares to Birkenhead, another to Hunting Horn, although they may every one be of different blood and form. Now this cannot possibly be right, if there is any principle whatever in breeding; and however good a horse may be, he cannot be suited to all mares. Some say that any sound thorough-bred horse will do for a thorough-bred mare of the same kind, and that all is a lottery; but I hope you now perceive that there is some science required to enable the breeder to draw many prizes. That the system generally followed of late is a bad one, I am satisfied, and with the usual and constant crossing and recrossing it is almost a lottery; but upon proper principles and careful management, there would be fewer blanks than at present. We cannot expect to find a perfect mare nor a perfect horse; there is some "if this," or "but that" in them all. The breeder, however, must be particularly careful that both should not be faulty in the same place—that both should not have the same objection—and whereon one is deficient the other must be unusually developed. In thus matching his mares the judgment of the breeder is proved, that they may "hit" well. The same rule of course applies to all animals. Mr. Bell well observes, that "the importance of the influence of the sire in breeding horses is in no point more clearly proved than by the fact that the progeny of the most celebrated racehorses have generally sustained the reputation of their sires. Thus the descendants of Eclipse numbered no less than 364 winners, and those of Matchem, Highflyer, and other celebrated horses have partaken of the same inherited excellence. Sultan, the property of the Duke of Beaufort, which covered a mare after he was 20 years old, Snap of the House, General, and Admiral of Ludlow, and not forgetting Sir Sampson, were celebrated stallions in this country 20 and 30 years ago; and though they are long since dead, yet they now live, and are well known in their descendants. It is a remarkable fact that the first male put to a female, especially if he be potent, influences more or less the progeny of that female by subsequent mules. A striking case of this kind was first published in the *Philosophical Transactions*. A splendid mare, seven-eighths Arab, had a mule by a quagga, in the year 1816, the mule bearing the unmistakable marks and stripes of the

quagga. In the years 1817, 1818, and 1823, this mare again foaled, and although she had not seen the quagga since 1816 her three foals were all marked with the curious quagga marks. Nor is this by any means an isolated case. Meckel observed similar results in the crossing of a wild boar with a domestic sow. Mr. Orton verified this fact in the case of dogs, and poultry. Mr. Merrick, in the *Veterinarian*, records the experience of his groom, who has had the management of stallions for 14 years, "that he has frequently noticed that well-bred mares, which had been difficult to stint with thorough-bred horses, have bred to an inferior, and subsequently to a thorough-bred stallion; but her stock by the latter has frequently showed traces of inferior blood, not to have been expected from the breed of either the sire or dam. You will, therefore, bear in mind that it is especially important that the first male given to a female should be well bred. I know that there is a foolish notion with some people about dogs, that the first litter is not likely to be good, therefore they allow the bitch for the first time to go about with any and every dog, little thinking the bad effect such treatment has upon future litters. In explanation of this phenomenon that eminent physiologist, Professor Carpenter, in his celebrated work upon "Human Physiology," writes: "Some of these cases appear referable to the strong mental impressions left by the first male parent upon the female; but there are others which seem to render it more likely that the blood of the female has imbibed from that of the fœtus, through the placental circulation, some of the attributes which the latter has derived from its male parent; and that the female may communicate these, with those proper to herself, to the subsequent offspring of a different male parentage." The same author also writes: "There seems good reason to believe that the attributes of the germ are in great degree dependent not merely upon the habitual condition of the parents, which have furnished its original components, but even upon the condition in which those parents may be at the time of sexual congress. Of this we have a remarkable proof in the phenomenon well known to breeders of horses, that a strong mental impression, made upon the female by a particular male, will give the offspring a resemblance to him, even though she had no sexual intercourse with him. In conclusion, allow me to say that agricultural societies are to be blamed very much for the little attention they pay to horses as compared with other stock, especially poultry. They ought to give liberal prizes to the best brood mares and stallions of all breeds, and pay as much attention to them—they deserve more—as to cattle, &c. The best stallion should have to travel within the district of the society during next season, and not to receive the prize until the end of that time. I must add that our great landlords generally overlook the interest of their tenants, and consequently their own also, in not keeping good thorough-bred stallions, of different breeds, for the use of their tenants at a nominal charge. Farmers themselves also overlook their own interest too often by being "penny wise and pound foolish," in looking more at the fee of the horse, when they engage him, than at his shape.

The CHAIRMAN said: I beg to congratulate Mr. Evans on his very able lecture, and I am sure, gentlemen, you will agree with me that our best thanks are due to Mr. Evans for the pains and trouble he must have taken to produce such an interesting and instructive lecture. I sympathize with Mr. Evans in his feelings of regret at the low state in which the breed of horses now stand in Shropshire. Before coming to reside in this county I had heard much of the celebrity of Shropshire for their breeds of animals; and I fondly hoped

that horses were within this category; more particularly that I am old enough to remember in boyish days the high encomiums that were passed on Shropshire hunters, as they rattled over the plains of Leicestershire. I therefore anticipated much pleasure in viewing this most noble of animals, in all its perfection, by my residence amongst you; but, alas! a short time tended to dispel the visions of my dream, for I soon found that a good Shropshire horse was now the exception, not the rule. This, gentlemen, is much to be regretted. You stand deservedly high in your breed of Herefords, and you have a world-wide fame in your breed of sheep. Why not, gentlemen, add to this a distinct breed of horses? I am sure, with the same determination and perseverance that has enabled you to raise up your celebrated Shropshire downs, from amidst the chaos that heretofore surrounded you, would enable you to raise a distinct and an equally famed breed of horses. I came from a residence in Lincolnshire and Suffolk. I there found a breed of horses second to none, and as true to their character as any of the celebrated breeds of cattle or sheep—"Go and do likewise." I have to apologize for having made these lengthened remarks in the presence of so many practical men, but I could not refrain from a desire to urge upon you the necessity of improving your brood of horses. Before I resume my seat I must beg to differ with the lecturer as to the formation of the draught horse—that his shoulders should be vertical and overhang the feet. It is true this formation may assist the horse to start its load, but I doubt very much the power of endurance in a horse so formed, and the probability is that before he arrived at his journey's end he would topple over on his knees, and you would have to leave him on the road-side (Hear).

Mr. EVANS reminded the Chairman that he had only said that the cart horse should have a shoulder comparatively upright; not so oblique as the hackney. He hated the sight, or even the thought of such an upright shoulder as the chairman had described (Hear, hear).

The CHAIRMAN: To some extent this may be true, but it is better to err on the other side. I shall now be happy to hear the opinions of any other gentleman.

Mr. JOHN MEIRE: I quite reciprocate the sentiments of our chairman in his eulogium on the interesting and instructive lecture we have just heard, a paper which evinces on the part of Mr. Evans great research and industry, and a little steady perseverance will bring him out a first-class lecturer. I admit, and with others deeply regret, the great falling off in the breeding of horses in Shropshire—but there are causes for it. During the Peninsular and Continental wars, the profits of farming in England assumed a high position, and landlords with increasing rents were not averse to see their tenants enjoy the sports of the field on the back of a good hunter, nor were parents averse to spare their sons occasionally from the toils of the farm, to brace up their system by joining in the noble pastime of fox-hunting, and those parents who had sufficient foresight endeavoured to breed such a class of horses, that whilst it enabled them to indulge their sons, at the same time created the necessity for the enlargement of their own pockets. My father was one (and there were many others) who was alive to this, and his first care was to secure good brood mares. This being done, common care in the selections of his stallions enabled him to raise up a class of hunters second to none, and that, too, with a sharp eye to profit and loss. The produce of one mare alone sold for £1,000, and this was not an isolated case, as many other farmers were equally successful. But on the termination of the war a great reverse in farming took place; agricultural produce of all descriptions fell to a fearful ebb. This made continual applications for a reduction

in rents necessary, and these applications seemed inconsistent with the retaining of hunting horses; indeed, there were landlords short-sighted enough to assert that farmers had no business with hunting horses. The consequence was a complete clearing-out of these valuable animals, and nothing was retained on the farm, except some ill-shaped mares that could not be turned into money, and from these ill-assorted dams the future breed of horses in Shropshire was to be sustained. The result has been what every sensible man anticipated—a complete blotting-out of Shropshire from the map of England as a horse-breeding county. But I think I see the dawn of better days. I now occasionally see some young farmers of the right sort show themselves in the field, and as this increases so will be the desire to improve the breed of horses. But I would strongly urge upon my brother-farmers the necessity of great care in the selection of brood mares, and never think of breeding from ill-formed parents. Remember, "like begets like." It is true, perhaps, that some of our best racers have been bred from small mares; but to breed hunters and carriage horses select roomy, weight-carrying mares. With this precaution, I do not despair of yet seeing Shropshire become as celebrated for its horses as it is now for its sheep (Cheers.)

Mr. H. SMITH: I sincerely congratulate and thank Mr. Evans for the very valuable paper he has just read to us. I know little of horses, as I never got astride of one; but I can truly sympathise with Mr. Evans in his regret on the breed of our hunters, for the hounds frequently pass over my farm, and although my hedges are very low the hunters make horrid large gaps. (Laughter.) I have had some little experience with sheep, and in my opinion both male and female have considerable influence on their progeny; and I am of opinion that if we are to maintain our superiority in sheep we must stick to the Shropshire breed. Any admixture with another blood will be sure to deteriorate the flock.

The CHAIRMAN: Have you such a distinct breed that you can go on without having recourse to the Southdown?

Mr. SAML. MEIRE: There is not a doubt of it. If I could ensure my life for 100 years, I could keep my flock up to its standard without going to any other flock for aid. It is very easy to do it when you know how. There is no doubt but that the Shropshire sheep is a cross-bred sheep, and what breed is not? I should like to ask those who boast of the purity of the Southdown as if that was the sheep that came out of the ark.

Mr. J. MEIRE: It is not attempted to be denied that the Shropshire is a cross-bred sheep. The original breed were horned sheep, and the first attempt at improvement was to get rid of those incumbrances; and there is little doubt but that this was effected by a cross from the Southdown. These sheep no doubt are well adapted for the downs, where they have to travel far and work hard for their living; but for our enclosures we wanted something more docile, consequently recourse was had to the Leicester—at least, that I know was my father's proceeding, dipping into each blood as the flock needed it. But when my friend to the left began to assume the helm of affairs, he asked himself this question—What is the object of this crossing and recrossing? Why, it is to produce a superior sheep to either of the existing breeds. I will not do it. I will produce sheep having the size and aptitude to fatten of the Leicester with the flesh of the Southdown. I will have his wool equal to the Leicester in length of staple, but not inferior to the Southdown in fineness of texture; and, gentlemen, he has done it. (Cheers.)

Mr. EVAN DAVIES expressed his regret for having fixed

the day of meeting on the assize day, causing the absence of so many members; but was highly gratified with the very able lecture, and with the very interesting discussion which it had called forth, and remarked that the opinion of the speakers fully corroborated the assertion of Mr. Evans that

a distinct breed of our domestic animals may be raised and maintained.

A vote of thanks was then passed to Mr. Evans and the Chairman, to which these gentlemen responded, when the meeting was terminated.

KINGSCOTE AGRICULTURAL ASSOCIATION.

CULTIVATION OF MANGEL WURZEL.

Mr. BURNETT said: Gentlemen, the first subject on the circular for this evening's discussion, is "The cultivation of mangel wurzel, and its use." It being one of great importance, I feel sorry some one more able than myself did not undertake to bring it before the meeting; however, I will at once tell the little I know, and hope every one present will do the same. On all good loams and clay soils mangel is, or will soon be the staple root crop; and on our light brashy, in this neighbourhood, we find it yield a much larger amount of highly nutritious food, than any other root yet introduced, and also a more certain crop than either swedes or turnips, for some years past. There are a great many varieties now cultivated; but those mostly grown in this neighbourhood are the red and yellow globes, which are most suitable for our light soils, their root not going so deep in search of food as the long varieties; they also keep better, owing to their not being so much broken in storing. I prefer the yellow, as I have always grown the heaviest crop of them, when grown side by side of red; they may not be so good in quality, or may be of a different flavour, having observed the sheep choose to eat the red first, when they were handed out to them. The long varieties require deep cultivation; but the globes will grow where any of our other roots will. I have often seen the largest mangel on the head land, and other portions of the field where it has been trodden hard. The general practice is to sow mangel on land that has produced a straw crop the preceding year. If there is couch in the land, or if over-run with black grass or other weeds, no time should be lost, after the straw crop is off, in having it skimmed over; having used several implements to perform this operation, such as Bentall's scarifier, Dean's Savory's, and others. I find the common plough, with a broadshare, to be the most efficient implement; it not only cuts off the weeds more regularly, but they are left in a better position for the drags to separate them from the soil: the couch should then be picked off, and burnt in large heaps, if weather permit; but should wet weather prevent the burning, my practice has been, after the weeds have lain on the surface about two months, to have them ploughed five or six inches deep or more, if not prevented by rocks. The land is left in this state till March, then cultivated; afterwards apply a pair of heavy drags, then harrow once or twice in a place, as may be needful, to separate the little live couch from the soil that may remain, which is then picked off, and the land is ready for ridging, which is done twenty-seven inches apart. About fourteen load of farm-yard dung is then put in the furrows, and three hundredweight of guano, or equal value of Proctor's mangel manure, sown broadcast; the manure is then covered by a common plough, going once in a place in the middle of the ridge, a roll following after, to compress the soil and to get a fine seed-bed, and also tends to keep the land in a moist state. The best time to sow is the third week in April; if deferred till May, the seed ought to be soaked in water twenty-four hours before sowing. The method I adopt, in depositing the seed, is one of rather old origin; but

I have always found it do well, at very little extra expence. A man walks along the furrow, with a stick about four feet long, tapering towards the point; makes the holes about fourteen inches apart; giving the stick a twist, which prevents the mould from filling up the holes; a woman follows, depositing the seed at the rate of 5 lbs. per acre; another woman follows with a small rake or hoe, and covers the seed; the ridges are again rolled. The singling out I prefer having done by pulling them out with the hand; I have had it done by boys and girls at an expence of 3s. per acre, and have found it answer better than when done by the hoe, especially in dry weather. In about a fortnight after the top of the ridge is gone over with the hand-hoe, a second and sometimes a third hoeing is required. I commence horse-hoeing between the rows before or after singling; in most seasons I horse-hoe four times. We now come to the storing of the roots. I used to have the tops twisted off, but now I have them cut, finding it less expensive, and the mangel keep equally as well. Last year I let eleven acres to four men to get up and cut the tops off, which they did in four and a-half days; three women and a man filled them in two carts in the same time; we store them in houses or pits to keep them from frost, which is all the care mangel requires, unless a very large quantity is put together, then ventilation is necessary. Under this system of cultivation I have had good success; however, last year having a field of light soil to put to mangel, and anxious to economise labour, I tried a different method, which I am pleased to say proved equal to my expectations; this field was eleven acres, and as I tried three systems of cultivation, I will call them number 1, 2, 3.—No. 1 was manured (on the stubble) with twelve loads of rotten dung, and raftered in at the same time: No. 2 was manured with eighteen loads of green or long dung, and ploughed in: No. 3 was ploughed at the same time, and the same quantity of long dung put in a heap, and applied in the spring (put in ridges as before described). The rafters of No. 1 was turned over in February, before commencing ridging; in April I had the whole field cultivated across the rafters and the ploughing, then harrowed, and after applying a dressing of artificial manure at a cost of 32s. per acre, it was ridged twenty-seven inches apart, the seed deposited, and other operations performed as in former seasons. To my surprise the mangels came up stronger, and looked better on No. 3; the first three months after that time, I could perceive no difference of either lots, and when taken up I found by weighing twenty perch of No. 2 and 3, there was five hundred-weight per acre more on No. 2, than on 3. I did not weigh No. 1, but was satisfied there was no perceivable difference; the artificial used was Proctor's mangel manure and Peruvian guano, one acre manured with guano at the same money-value as the mixture of Proctor's guano, on which there was the same quantity of food. Although they did not look so well as the others for some time, yet at the time of storing they appeared in a more growing state; this may be accounted for, owing to the very dry weather in the first part of the

season. Part of the field had a dressing of salt, four hundred-weight per acre; I could see no difference of the crop on that portion of the field; and although I doubt not but salt may be applied with success on some soils, yet I believe it had better be used as sauce or medicine, than as a manure, under the system of cultivation and manuring. I have stated I have grown from twenty-eight tons to thirty-eight per acre. I am well aware that much larger crops can be grown, with a greater amount of outlay for manures; but whether it is advisable to do so, I am not prepared to give an opinion. I know of fifty-five tons per acre having been grown last year on a heavy clay soil, at an expense of £7 6s. per acre for manure. Much more might be said on the cultivation; but as the object of our meeting is for discussion by the several members, I will pass on to that very important part of our subject, the use of mangel. It is used for different purposes; but I will confine myself to its use as food for animals: all animals are greatly fond of it. The time was when it was only considered useful a few weeks in spring; now differently, it can be and is used all the year. Beginning with the tops in November, we find the dairy cows increase in milk when they have them hauled out on the pasture, which at that season is getting short; they are a month's food for the pigs in the yards; the ewes do well when folding over the land, and pick up what is left—so all is finished up with little waste. When mangel is given to cattle in the autumn, great care is required not to give too liberal at first, especially to young and weak animals, as the mangels are at that time of a very laxative quality. The new mode of pulping and mixing with chaff is one which every farmer ought to adopt; by it he can regulate the system of his animals, and they will do better on one-third less roots than when given them alone. I believe all roots ought to be pulped and mixed with chaff if the cattle are meant to continue a part of the straw; but mangels should never be given unless mixed with chaff (or meal, if to calves or fattening cattle). For instance, if store cattle are fed on one-third the quantity of mangel they would eat, they will eat but little straw, and be very uneasy, always looking after every one that passes, and appear as if they had not seen food for a long time; when the mangel and straw cut into chaff are mixed together, they will eat both, do well, and live content. Horses also do well on mangel as a substitute for bran: besides the virtue they derive from the mangel, when mixed with their chaff it makes it moist and sweetens the taste, which induces them to eat more than they otherwise would. I need hardly say that pigs do well on mangel, for most here know that porkers will soon become bacon on it. What other root is of equal service to the farmer in the months of April and May to give his ewes and lambs? They add to the condition of the ewe, increase the quantity and enrich the quality of the milk for the lambs. On no other food did I ever see ewes and lambs do so well (at the same expense) as when on grass with a liberal quantity of mangels given them. As regards its fattening properties in feeding cattle I have had but little experience; therefore I will give the experiment of the late Earl Spencer, in the Royal Agricultural Society's *Journal*. He says, "I believe that mangel contains more saccharine matter than Swedish turnips and consequently to be the more nourishing root of the two. I determined to try practically whether an ox fed upon mangel increased in weight more than one fed upon swedes, in proportion to the quantity consumed." On the 24th of December he put No. 1 on swedes, and No. 2 on mangolds, both animals the same weight; on the 23rd of January No. 1 had consumed 1,624lbs. of swedes, and measured 4 ft. 10 in. in length by 6 ft. 7 in., making him to weigh 703lbs., and to have increased in weight 85lbs., or at the rate of 48½lbs. for every ton of

swedes consumed. No. 2 had consumed 1,848lbs. of mangel, and measured 4 ft. 10 in. by 6 ft. 8 in. girth, making him weigh 721lbs., and to have increased in weight 53lbs., or at the rate of 65½lbs. for every ton of mangold consumed. This difference, however, might have arisen from No. 2 having a greater propensity to feed than No. 1; I therefore now put No. 1 to mangel, and No. 2 to swedes. On the 20th of February No. 1 had consumed 1,884lbs. of mangel, and weighing according to measurement 734lbs., having increased in weight this month 31lbs., or at a rate of 36½lbs. for every ton of mangel consumed. No. 2 had consumed 1,880lbs. of swedes, and according to measurement weighed 734lbs., increase 13lbs., or at a rate of 15½lbs. for every ton of swedes consumed. I then put both to mangels, and on the 19th of March they had each consumed 1,792lbs. of mangel. No. 1 increased 50lbs., and No. 2 81lbs. It would appear the propensity to feed of No. 1 was greater than No. 2, in the proportion of 50 to 31; but, notwithstanding this, in the first month, when No. 1 was on swedes, and No. 2 on mangel, No. 2 beat No. 1 65½ to 48½. I sold No. 1 to a butcher in the county for £24 3s., and No. 2 in Smithfield for £24. It will be for practical men to decide upon the value of this trial. What appears to me to be the most conclusive part of it is that No. 2, who had during the first month when he was feeding upon mangel increased in girth three inches, in the next, when on swedes, no increase at all; and when in the three months he was again feeding on mangel, he again began to increase in girth, because it is well known that if an animal is changed from more to less nutritious food the probable consequence will be that his growth will be stopped. The result appeared to me so decisive, that I have not tried the experiment with the same accuracy since; but I did try, the following year, feeding a cow alternately on swedes and mangel, and though I have not by me the details of the trial, I remember that the result confirmed the experiment of the previous year. Dr. Voelcker, in his pamphlet on the Chemistry of Food, says, "Practical experience, if I am not mistaken, has shown that the different roots follow each other, as regards their nutritive value, namely—1st, potatoes; 2nd, parsnips; 3rd, carrots; 4th, mangels; 5th, swedes; 6th, swedes." After giving the analyses, which will be found in the same work, he says, "Mangels contain on an average as much water and dry matters as carrots, and on the whole are almost as nutritious as carrots, if they are given to fattening stock, after a few months' keeping. When newly taken out of the ground mangel contains a peculiar acrid substance, which has a tendency to scour animals who feed upon the fresh roots: although it has not been shown whether or not this acrid principle disappears on storing away mangels for some months, it is a well-known fact that after a few months' keeping they have not this tendency to scour, and are much more nutritious than in a fresh state. The superior fattening value of stored mangels when compared with the fresh root may be due to the absence of this acrid principle in old roots; but doubtless it must be attributed also to the larger amount of sugar which stored mangels contain." I might go on quoting from different writers; but having given you my opinion as requested, I trust what I have said will induce some present to take up the subject, and give a detail of their more lengthened experience for the benefit of us all.

Mr. HARRISON had listened with particular interest to the remarks that had fallen from Mr. Burnett, as he believed him to be a very successful grower of mangel wurzel. He thought the kind or description of soil must in some measure regulate the cultivation; but that on all soils autumn tillage was necessary, so that the planting might be proceeded with at the proper time in the spring. Yard

manure, in its fresh state, he was of opinion might be advantageously applied to heavy land, and ploughed-in in the autumn (that is if the land is clean), as it would greatly assist its pulverization. In addition to yard manure he had used superphosphate at the rate of 2 cwt. per acre., leaving a portion without any. Where applied the plants grew faster for a time; but when taken up, there was no perceptible difference. Mangel he thought to be a very important root, and was grown to a greater extent each succeeding year. He thought, with Mr. Burnett, the best mode of using was to pulp or mince them, and mix with chaff.

Mr. THOMAS was not surprised at Mr. Harrison's not perceiving any difference in his mangel when he applied the superphosphate; his vale land being of itself so rich would be good manure for the poor soils of the hills. He differed with Mr. Burnett in his mode of planting, as he believed drilling the seed was better than dibbling; the plants coming up more regular were more easily singled with the hoe. When dibbled the roots of the plants so entwine each other that it was difficult to separate them with the hoe; and it was not every one that could obtain children to single them by the hand. He usually planted on the ridge, drilling with one of Garrett's drills, taking three rows at a time, 23 inches apart. He gave a liberal dressing of yard manure, with a little guano applied at the time of planting. Mangel with the same treatment gave a greater weight per acre than either common turnips or swedes, and their keeping properties being so good made them a valuable root; and they were very serviceable for ewes and lambs in the spring of the year. He had also given them through the month of April to fatting sheep, which did very well on them.

Mr. D. HOLBOROW observed that Mr. Thomas's testimony as to feeding sheep with mangold differed from an experiment he had seen stated in Dr. Voëleker's pamphlet "On the Chemistry of Food." It was one tried by that gentleman at the Royal Agricultural College, Cirencester, and it went to show that as food for sheep it was worthless, as after four months' keep with a fixed and limited quantity of hay and as much sliced mangolds as they would eat, he found they had not increased a single pound. Perhaps some one else present had used them for feeding sheep, and would be kind enough to state the results of his experience.

Mr. G. ROBISON said he had used mangel with hay and a small quantity of corn for fattening sheep, for some years. Last year he fed forty on pulped mangel and hay-chaff, and he never had sheep do better at the same expense. He must remark, however, that he did not commence using them till the month of March. He also thought them a good food for ewes and lambs, as they created a supply of milk. He agreed with what had been said on manuring heavy land with farm-yard manure in the autumn; but on thin, light soils he should prefer applying it in the spring.

Mr. E. DREW agreed with Mr. Harrison, that Mr. Burnett's remarks were of great interest. His own mode was to clean the land as soon after harvest as possible, then plough as deep as the soil will admit, cross plough early in spring, harrowing and rolling sufficient to get a fine tilth, which he thought a great requisite for mangel. He planted on the ridge with the drill, generally using artificial manure exclusively; viz., 4 cwt. Proctor's mangel manure, and 2 cwt. guano, two-thirds of which he applied

(after drawing the boulds) with the hand, covering with the plough, drilling the remainder mixed with ashes; frequently horse and hand hoe, beginning as soon as the plants and weather will allow. He thought mangel required room; 27 inches was quite near enough for the rows, singling out to 14 or 15 inches. The year before last the wireworms so thinned the plant on about an acre in one corner of a 10-acre piece, that I thought it would be a total failure. I however let them remain, and on taking them up there was almost as great a weight as the average of the field: many of the roots were 28lbs. each, and few of them less than 20lbs. There was not a root on $1\frac{1}{2}$ square yards, whilst the remainder of the field averaged over three to the square yard. In the same field I tried a little experiment with different kinds of artificial manures; viz., Proctor's mangel manure, do. and guano, do. and bones, guano, bones, bones and guano, all at an expense of 64s. an acre. The weight of roots, exclusive of tops, and number, per acre, are as follows:—

	Weight.				No. of Roots.
	Tons.	cwts.	qrs.	lbs.	
Proctor's mangel manure	33	17	0	7	14,976
Ditto and guano	33	16	1	23	15,084
Guano	33	13	1	4	15,197
Proctor's, and bones	33	12	2	17	15,311
Guano and ditto	33	10	0	15	15,617
Bones	33	6	3	11	16,003

This experiment appears to be in favour of Proctor's manure as it gives the greatest weight, and bones the least. The difference in respective lots is so trifling, only 10cwt. 24lbs. between the highest and the lowest, that I think if we take into consideration that bones and guano are more lasting in their effects, the opposite conclusion must be arrived at. Mr. Burnett stated an instance of a friend of his having grown 55 tons per acre at a cost of £7 6s. an acre, and rather intimated a doubt whether it was wise to expend so large a sum for their production. Now, it is well known you may apply almost any quantity of manure for mangel without risk of injuring the root. It is not the expense per acre that is to be looked at, but the cost per ton of producing the crop; and I believe, on calculation, Mr. Burnett's 35 tons will be found to cost much the same per ton as his friend's 55.

Col. NIGEL KINGSCOTE said he was not to tell the gentlemen present what width to plant their mangel; but what he had heard from Mr. Drew confirmed his opinion, the greater the distance (in reason) the more heavy the crop. When shooting in Leicestershire this season, he saw the largest mangel he had ever seen, in a field where the plant had partly failed. He did not know the weight per acre, but was convinced it was more than on other fields where there was a much larger number of roots.

Mr. BURNETT was of the same opinion as Mr. Drew, that mangel can be forced to a great extent with manure without injury to the roots, and also that the crop of 35 tons cost as much per acre (for manure) as the 55; but the value of the land of the former is 30s., and the latter 50s. per acre; the soil was also more adapted for the growth of mangel.

The subject was warmly discussed, in which all the members present took a part.

A resolution was passed, which approved of autumn cultivation and using mangold pulped mixed with chaff.

The proceedings of the evening were closed with a vote of thanks to Mr. Burnett.

PROPOSED PREMIUMS FOR IRISH-BRED STOCK.

THE IRISH SHORT-HORN.

TO CAPTAIN CROKER, BALLYNAGARD.

DEAR SIR,—In the report of the last Monthly Council Meeting of the Royal Agricultural Improvement Society, my attention was drawn to your bringing before the Council a letter of Mr. Campion's, containing two of the most important topics to all interested in the breeding of short-horns in Ireland that can well be discussed.

Now being well aware of your desire to forward the breeding of improved stock in the country, and that your only wish is, fairly to have every subject connected with it viewed in all its bearings; and having had lately some little experience of the weight of your influence, backed out by the perseverance and energy that always accompany it; I shall make it my only apology for troubling you with the following remarks, on the subject of Mr. Campion's letter.

Few indeed but will admit, that special prizes, for Irish-bred stock, would add an additional stimulant to the competition at our shows, and thus be productive of some good; and as having had something to do with the breeding and exhibiting of stock, I can assure you, nothing would be more encouraging to the young beginner, or more soothing to the over-agitated frame and irritable nervous system of an old warrior on the eve of a fresh contest, than the knowledge of the fact, that in one section of prizes, at least, he would have a friendly shield interposed between him and the overwhelming weight of some of our great dons; and thus not have to run the risk of appearing before the public shorn of all laurels. But, though this view of the subject may appear very well, take care we do not buy our felicity at too dear a price. How would it appear, going before the world, in the prize sheet of the Royal Society, that the Irish-bred short-horns are not able to compete with the English and Scotch? And how would it tell on, and bear out the fact, that has lately been gaining ground, and getting circulated even to the far western states of the new world, that better and cheaper short-horns are to be had in Ireland than in any part of the world? And which now has the effect of regularly bringing round the buyers for Australia every autumn, to pick up all the young bulls they can. And would it not even do much to rebuff the fact, that such men as Colonel Towneley, Mr. Stratton, and others, are now glad to come to Ireland to look for their bulls? And would it not tend to keep us still longer out of the foreign trade in short-horns?—which, after all, has been the great stimulant to breeding in England—or, in a word, would it not cast a slur on our breeding? My idea has always been, that anything that tends to draw the least distinction between our stock and the English will tell to our disadvantage; how much more injurious would it then be for us, thus to set up and publish our inferiority. I may here also say, this wish to avoid all distinction between the English, Scotch, and Irish stock, is the cause of my great objections to a separate registry of Irish short-horns.

But, after all, this is not the main point of the question; the question to consider is—do we in reality require protection? To which I decidedly answer, no; if we are only put on a fair footing with the English exhibitors, and protected against those animals that belong to the "little trade," as Mr. Campion calls it; or, at least, let them be made to fulfil fairly

the conditions of the Society, and then trade or no trade animals will make but little matter. But as this will at once bring us into the much-vexed question of over-feeding and its results, which affects English as well as Irish breeders, let us first see how, at our own shows, we are not on even terms (so far, at least, as has been shown up, before the public is concerned) with our English and Scotch friends.

What I complain of is, that not only do the English and Scotch breeders get every facility (and very justly) of entering, having stock brought free, &c., but they are also always afforded an opportunity of first testing the merits of their animals at home, at the great all-England show; and not only are our entries fixed for closing the day after the all-England show, but our secretary is sent over specially to invite the one or two champions of (I may say) the world, to let us, as it were, see how much in the back ground we are, and to knock the conceit and spirit out of all our young hands; but if this was the only effect of this system it would be of little matter, as, in my mind, a sound thrashing does one good, as it fixes firmly in the eye a higher standard of the perfection to which we must work our stock before we can hope for success. It has, however, other and far more serious effects, and tends virtually to benumb the whole short-horn trade at home; as this constant bringing before the eyes of our agriculturists nothing but the single top animal of all England, exalts their ideas of all English-bred stock, and, consequently, when they have eighty or one-hundred pounds to give for a bull, off they go to England; and I could now name more than one instance where parties have paid dear for their trip, by giving their money for a very second or even third-rate animal; the idea of his being English bred being sufficient for them.

That English-bred short-horns, taken as a whole, possess no such superiority is evident to any real judge who had an opportunity of seeing the stock exhibited at the last spring show of our Dublin Society, and then paying a visit to Chester, and inspecting the short-horn classes there. And what though Mr. Douglas did walk off with the Dublin Society's cup with his heifers (he won also with his heifers at Chester), and though he also won with his yearling bull (the first time it was ever won by an English or Scotch exhibition, though they have often tried), none of the Irish breeders envied him; for he in his turn (quite as often as he has won) has on former occasions lent his aid to grace their triumphs. And if we looked to the two-year-old bull class, we would see some of the Yorkshiremen themselves added to the laurels of the Irish winners; or could any one doubt, but that the prize bulls at Chester, which by their age would have come into this class, would have shared the same fate if they were there; and if we only look over the prize lists of the Royal Dublin Society for a few years back, we will find many names recording the superiority of the Irish stock, and among others the no-less-celebrated ones than "Grand Turk," and "Lady Mary." That it requires as severe a test as the all-England show to make sure of winning in Ireland, the history of the Society itself proves, for at the last meeting, held at Cork, the late Mr. Harvey Combe sent over his bull, which was second-prize two-year-old bull for the year at the All-England show,

and which with some others only served to add lustre to the triumph of one of our southern breeders, Mr. William Coppinger. That our friends on the other side of the channel have profited by such lessons is evident, as when our entries closed before the All-England show, our catalogues contained plenty of names of parties who never had a beast at any of the shows, the winners in England only coming. If you wish then to give our breeders a fair field, you must move not alone your entries, but also your show, before the All-England one; and I can see no objection to so doing. It may be said, we would have no English exhibitors at our shows, and that we could not do without them; but the Dublin Society's catalogue will prove the fallacy of this argument; as we have always three or four English or Scotch exhibitors there, and consequently more than ever attend the shows of the Royal Agricultural Improvement Society; and it would not only bring us into a more convenient time of the year, but would turn the tables, and give us an opportunity of testing ourselves at home, and thus tend, when we had any thing worth while, to embolden us to repay some of the many visits we owe across the channel. Now you must not think I consider even with these changes that a great part of our prizes would not go to England and Scotland. Such an expectation would be unreasonable, when we know that there are at least seven times the number of short-horns bred in the sister kingdom (I mean show-going ones) that there are here; and, when we add to this, that they have some two or three men of such long-standing and known perseverance that we cannot count one fit to match them; and when we also know that two of our best men (and two is a mighty loss in such a struggle) never or rarely exhibit, except yearlings at the Royal Dublin Society's shows, it would be unreasonable to expect we could have it all our own way; but what I maintain it would do is, that through the eagerness of the English breeders to reap laurels among us, it would always supply us with a fair sample (not a picked one, as at present) of the English show-going short-horns, and afford us a full opportunity of occasionally beating them, and always give the world a fair standard to judge from of the relative merits of the stock of each country, and afford our young breeders a good chance of gathering laurels (and one thus won in open competition would be worth a dozen sully by the shades of a protection clause), without being subject to the certainty of the overwhelming pressure of the presence of the champions of the All-England meeting, who derive such an additional lustre from coming thus before our judges arrayed in all their late triumphs, that to over them with equally good animals would be impossible.

With regard to the system carried out with some of our show stock, the only thing I see fairly to find fault with is, that some men, with large and valuable herds, deeply interested in keeping up an old and well-established reputation, or in endeavouring to start a new one, find it their interest to put up, we will say, a pair of two year olds and a pair of three year old heifers (I leave out yearlings as they cannot be injured, and cows that have once gone through the ordeal as two and three year olds will seldom break down, under judicious management) and face them forward regardless of all consequences. That the injurious results of this system have been deeply felt, is evident, from all that has been said and done to check the over-feeding of show stock; and that anything that has as yet been done to bring it to a stop, has proved quite ineffectual, is just as certain. It is not to be wondered at that the jury and disqualifying system would not answer; as, after all, the best and only true test, of the real superiority of a short-horn, is the amount of flesh it can carry, and still naturally and regularly produce its produce; it is not, then, strange that all the

mighty efforts made to put down the over-feeding system have dwindled into a mere inquiry as to from what time the heifer is in calf, and a regulation that the prize shall be withheld until such calf be produced; and in the case of cows and heifer in milk, a simple inquiry as to the date of the production of the last live calf. Now, the fault of this check lies in the fact, that the parties thus exhibiting first, secure all they require in the blush and notoriety they gain at the show. For what check on such men, as in the very animals they thus force forward, first risk hundreds, can possibly be the after withholding of a paltry five pound prize, which nobody hears of and none care about. In the case of three year old heifers the thing takes another turn and one easier of cure, for though they all fulfil the stipulations of the society, as far as being able to give a date on which a live calf was produced; still (do not start, captain), scarce a fifth-part of them in reality fulfil the stipulations of the society, inasmuch as scarce any of them produce their live calves in such a state as it is possible to rear them. If the loss stopped here, it would not press even so hard on beginners and parties with but a few animals, as it in reality does; as one might well run the risk of sacrificing a calf for the honour of winning an All-England first prize; but, unfortunately, it does not stop here, for when a three year old heifer goes wrong in this way, from over-feeding, up to the last moment, she is very apt to go wrong altogether. It may, however, be thought the deep losses in such cases would be their own cure—and so they are in all ordinary cases; but, when we have men with large herds, and larger fortunes at their back; and when we have one whose reputation for superior stock brings them in, for the use of the bulls of the herd alone, no less than £5,000 a year, we need not be surprised that the feverish excitement got up about the great superiority of such stock must be maintained at any cost; though, in some cases, the expense is even a Bride's Maid, and in others nothing less than the total ruin of that handsomest short-horn that ever decked an English herd—The Queen of the May.

Now that such an over feeding, or as I may call it, such expenditure for show-yard honours, tells heavily on all beginners, and in fact, on all who have not large herds and vast property, to enable them to make such sacrifice, no one can for a moment doubt; and I can assure you I have before now felt, and am likely to again feel, the great pressure of such a state of things; and to prove that stock exhibited under such circumstances are not on even terms of competition, and that those that are, force feed to such a degree, that it is not possible to rear their live calves, have always the best of it. I shall give you but three instances out of the many that have come under my personal knowledge, and in so doing shall confine my remarks to cases of my own with Mr. Champion, so as to avoid as much as possible the unpleasant task of meddling with others. The first I shall mention is, perhaps, the strongest case on record, as it is the only one I ever heard of, where the judges recommend it to the notice of the council. It was in 1856, at the show of the Royal Dublin Society, where I exhibited our heifer Florence (dam of Foundation, and her heifer calf of the year), against Mr. Champion's well-known Jenny. The case was so marked, (the one animal in all the bloom and vigour of full breeding condition, the other looking anything but a breeder), that the judges at once turned to Dr. Colins, who was steward on that occasion, and said, "This case, we think, deserves to be brought under the notice of the council; here we have a very first-class pair of heifers, one with all the unmistakable evidence about her of a breeder, the other, to say the least, a doubtful-looking case, and consequently having a much better furnished carcass of flesh." Dr. Colins only

shakes his head, quietly turns over his notes, and tells them both heifers are entered as having produced live calves, and so the matter ends; and I was obliged to put up with a second place; though I believe I am correct, when I state that Mr. Champion never succeeded in rearing but one calf from Jenny, and this was the bull calf she produced the year after; and when we compare this with the fact that Florence has, I believe by this, produced her fourth calf (all of which lived), and for the very calf of the year referred to (Foundation), that along with forty or fifty pounds in prizes and medals, and a year's service, (from which I am happy to say I have fruits that will be apt to trouble some of our friends to get over), I am now able to jingle the Marquis of Waterford's two hundred guineas in my pocket; it is not going too far to say that Mr. Champion's triumph was dearly bought, and such as I could not afford to indulge in. Another case of mine was at Carlow, in 1855, when with Queen of Beauty, I came in contact with Mr. Champion's Ladylike (the only Irish bred cow of her day that Queen of Beauty has not at one time or other conquered, for Ladylike is Irish-bred, though having taken up her abode for a while at Athelstaneford); and where I had again to bow to Mr. Champion's superior condition, owing, perhaps, in some respect to his cow not having produced a calf that year, though she was, I believe, in calf at the time. I may, however, be told I am not up to the management of these stock, or have not the right sorts, so I will now give you a case, where, undoubtedly, the best manager of stock in Briton had to bow in consequence of having let off a little of the bloom of his condition, to produce a calf. The case I allude to is that of Mr. Cultshaw's (manager of the Towneley herd till then never beaten), where she had to put up with a commendation, as there (in consequence of that absurd rule of dating ages from the first of July), which has amongst other ill consequences that of jumbling heifers that have had, and those that have not had produce, in one class, and which rule the Society may also thank for the inferior turn out it always has of Bull calves, and which contrasts so forcibly, and so much to our credit with the class (of about the same age at the time of exhibition) of fine vigorous spring-dropped animals, always to be seen at our Dublin Society shows; and our great superiority in which class, over anything exhibited in England at the same age, can be attributed only to the baneful effects of thus putting so great an inducement, for the sake of gaining age, to have calves dropped in, undoubtedly, the worst season of the year, the ill effect of which it is well known an animal can scarce overcome for the first year—as the class thus spreads into two years, and she being calved in 1855, Mr. Cultshaw prudently deemed it too long to let her run without having produce, so tried the experiment of making her have her calf, and still be a match for those in the full bloom of condition coming on theirs. That even she was beaten under such circumstances is not much to be wondered at; but I am much mistaken if she will not again redeem all her lost laurels the first time they again meet, under fairer circumstances.

Though I have run this letter to an over-extended length already, still I cannot close it without a few remarks on the production of calves which are not perhaps generally known. There are but few people who do not know that nine months is the time a cow should carry her calf; but it is not equally well understood, I believe, that if the calf is not carried at least four or five days over this time (the general average being from eight to fifteen days over, according to the sex of the calf, the season of the year, and the constitution of the cow) that it will be almost impossible to rear the calf; and if the early calving is produced by over-feeding, the risk is doubled. It is

also perhaps less understood that little or no change takes place in the outward appearance of the calf from the time it is carried six months until about three weeks previous to the nine months being up, except that it gets a coat of hair (something like a mouse), grows a very little larger, and gets life; and that it is in the last week and the few extra days that it comes to its full hair, full sex, and receives its necessary life, strength, and vigour. And thus it is when a beast is forced on to the very last, and when coming on her calf, that she gets unwieldy, helpless, and completely unnerved; and into such a state, that if her produce came to its full size she could never produce it. Then it is that old Dame Nature steps in, and saves the animal by bringing forward the calf a few days sooner than it otherwise would, and before it comes to its full size, and is consequently much easier produced; and, true to her calling, generally sets a seal at the same time on all future production of produce, so that it may not again interfere with the predominant characteristic of the animal—its fat-producing property. Thus it is that nearly all the three-year-olds that now astonish the world are virtually no breeders, though doubtless we have had some cases to the contrary, and among which may be mentioned Colonel Towneley's roan Duchesa the 2nd, and Mr. Douglass's Rose of Summer; but though these did, I believe, produce calves that were reared, I would like to know if the latter gentleman was equally successful with the live produce of his heifer, Rose of Athelstane, which entitled her to win our cup at Waterford. Now my idea is—if our show managers wish to give us protection against those men who can afford to go to such extremes, and, in fact, whose interest it is to do so at all risks, and at the same time to level a deadly blow against all over-feeding—let them at once pass a rule that all three-year-olds must have produced their calves previous to the date of show, and that such calves must be then actually alive. The two-year-old case is more difficult to deal with. My idea would be, where the cases were at all doubtful, to withhold all prizes, and put a large placard upon the class, to the effect that the prizes were withheld until it could be seen which of the animals produced their calves in the most satisfactory state; and that if all did so safely, that the prizes should be awarded to so-and-so. This would check the public ardour, bring them to look fairly at the cases as they stood, and it would also act as a wholesome check on the over-feeding of the heifers coming on their calving, and punish severely any who persevered in pushing things too far, by making public their loss and failure. That such a course would save, to be a good and useful brood cow, many a fine heifer that will now founder on her first calf, I have not the slightest doubt; and that something requires to be done is evident from the rapid spread of the evil, which has even now made its appearance here at home among ourselves, in the case of The Maid of Kibogget, who lost in this manner her first produce the other day.

Remain, yours respectfully,

LUKE CHRISTY.

Fort Union, Adare, Co. Limerick, March 17th, 1859.

MIXED FEED.—A bushel of carrots and a bushel of oats are as good for a horse, at moderate work, as two bushels of oats—not because the carrots contain as much nutriment as the bushel of oats, for they do not; but they aid the digestive organs in a more perfect appropriation of the nutritive principles in both. When horses are continually fed on oats, much of the food passes undigested, and is a dead loss, except to the manure heap. So with sheep and cattle. Give them a few roots daily, and they will have a better appetite, digest their food better, and eat greedily coarse hay, that they would otherwise trample under foot.

NATURAL AND COMMERCIAL FEATURES OF THE NORTH AMERICAN CONTINENT.

No. I.

To enable us to form a proper estimate of the present and further growth of the produce trade of North America, we must understand what the natural and commercial features of that great continent really are. Unless we do so, we are as likely to think of these too lightly or too extravagantly as to hit the mark ; and a dry array of figures is not enough.

Considering that the New World is but a portion of the Old, separated by a wide and stormy ocean, and new in the sense only that it was unknown till lately, it is unreasonable to suppose that other laws of nature than those with which we are familiar have existence there, and that the physical conformation of the country differs from that which we witness here in England every day. Yet such unreasonableness is not the exception, but the rule. The great mass have as vague notions of America as if that country were located in the moon, and believe in endless feet of richest black surface soil, endless cropping without labour or manure, and endless felicity in the Canadian bush, or upon the western prairie.

Some there are, however, who look upon America with a jaundiced eye, and are incredulous of the great industrial and social progress that has already, and is still taking place. Such are not aware that the United States, at no remote period, bid fair to feed the world ; that to-day, at a thousand miles back from the Atlantic sea-board, the looms of Lyons and Spitalfields and India are more freely patronized than anywhere in Europe by equal numbers ; and that those are not wanting with gifts and attainments of the highest order. It is a fact that the North West contains the gay, and rich, and virtuous, as well as the vicious and depraved ; and that here and there its school-houses, its business places and its astra are not surpassed by the best in Europe.

To America we owe the perfection of the telegraph, the reaping-machine, and innumerable mechanical contrivances of the most useful kind ; and in the coarser-manufactured cottons the Massachusetts manufacturer competes successfully wherever these are used.

It is nothing that America has enormous inland seas, rivers navigable for several thousand miles, boundless forests and prairies, cloudless skies, the extremes of heat and cold, and the greatest cataract. These are the accidents of the country only, and with them removed or modified, there would be little in fertility or otherwise to distinguish America from other lands. In America, as here and elsewhere, in the sweat of his brow man tills the ground, and in exact proportion as he sows in spring so he reaps at harvest.

In fact, the real counterpart of all we meet in North America (with the exception of what is accidental and extraordinary), is to be found in England. Penetrate into an English forest, and in its oppressive solitude all that is wanting to make it redolent of Canada and grizzly bears, is an occasional decayed and fallen tree, or successive pools of weed-grown water, flanked by prickly brushwood through which one can scarcely penetrate. To be sure, the majestic pine is absent ; but the backwoodman often chops a life-time among oak, and hemlock, and beech, and maple.

Scotland abounds in the scenery of Vermont and New

Hampshire, and can match the classic grandeur of the Hudson river, the thousand islands, and the lakes ; and Wales and Windermere are quite as wild and pleasing as the Alleghany chain and the Juniata. The Western prairie may be seen on Plaiatow Marsh ; and the bush and prairie clap-board dwelling among the cabbage gardens outside of modern Babel.

In fine, the great point of difference is that of size ; England with its intelligence and power being an ocean speck only, and America a world. And when that only substantial point of difference is known among the trading and emigrating English mass, some real progress will have been made in the way of understanding things as they really are in the United States and Canada, and incalculable disappointment and misery spared in future.

One of the distinguishing features of North America, is the existence of wooded and unwooded lands, the former usually termed bush, the latter prairie. The wooded portion of the country may be said to embrace the whole territory east of the Mississippi, including the whole of Canada ; and the unwooded portion the whole territory west of the Mississippi. That division, strictly speaking, is not correct, as bush and prairie exist on both sides of that line, but practically it is, and particularly in connexion with the present inquiry, which is limited to the consideration of staple products, the yield either of bush or prairie lands.

Woodland, it is scarcely necessary to remark, requires a large expenditure of labour or capital before it is fitted for the growth of crops or even for the feed of cattle. First of all, the trees have to be chopped at a convenient height for the swinging of the axe, and afterwards the remaining trunk, together with the roots, has to be dug out or pulled before there is an approximation to a civilized grain-bearing field. If these obstructions are suffered to remain, the process of cultivation is necessarily of the most imperfect kind ; and, whether removed or not, the great work of rough clearing, in anticipation of all strictly agricultural labour, retards extended operations. The farmer, unless rich—and that he seldom is, in a wooded country—cannot bring in more clearing, in a single year, than his own brawny arm can chop during winter ; and if he pulls out stumps as he goes along, he will really make the slowest kind of progress. Individual instances could be adduced in which, after five or six years' assiduous labour, not exceeding 30 acres have been roughly cleared ; and outside of that clearing there is but indifferent summer, and no winter-feed for cattle. Under such circumstances, the high prices of one year have little influence on the production of another ; and expectations from the bush, in the matter of supply, must be moderate both for the present and the future. Taking Canada as representative of bush-farming, the trade and navigation returns of that province, for three years, prove such to be the case, the grain-surplus of 1857 being much less than that of either of the two previous years.

TOTAL WHEAT EXPORTS FROM CANADA TO ALL PARTS.	
Wheat.	Bushels.
1855	3,193,700
1856	4,997,600
1857	2,762,400
	F F

The appearance of a bush-farm, and the condition of the farmer and his dependants, do not need repetition here. Everything is the opposite of everything in England. The farm, it may be, is an uneven roadside opening in a dense forest, round which zigzag fencing has been raised, to keep cows and hogs from an attack upon the crop; and the crop is visible between a few solitary blazed and girdled trees, and a thousand stumps. The farm-house and steading, it may be, is one rude erection, affording shelter to the household and the stock, and not unfrequently storage also to the products of the soil. In perhaps the majority of cases, these buildings are inferior in style and comfort to the worst specimens of peasant-huts, in the worst parts of Ireland, during the potato-famine; and the inmates, as a whole, are socially worse than Southern negroes or the serfs of Russia. The farmer does not, as in England, keep his dog-cart and attend meetings of the hounds, but drives an ill-fed pair of oxen, and too frequently, in anticipation even, dissipates all he has in some neighbouring rot-gut whiskey-grocery. The story of the heart-broken misery of the families of such would appal the callous, and go far to give contentment at home to many with the honest, humble English garret-fare of bread and water.

Unwooded or prairie land presents a more hopeful prospect, inasmuch as equal labour and equal capital yield twice or thrice the product that woodland does. The miserable drudgery of chopping out a farm from dense heavy-timbered forest land, and being cursed with dead trees and stumps for ten years at least, is not suffered on the prairie. What is needed there is a few fence-posts and boards; and these are to be had at all times on easy terms: and, with a fence erected, the work of farming may be commenced as easily as on English park or fallow. The surface of the country is a dead level, without bush or tree, and the soil sometimes without a pebble. Nothing more is necessary than to break the grass with a surface-plough, scatter in the seed, and apply McCormick's reaper at the harvest. Then the prairie-grass outside the fence is available for cattle-feeding; and a single mounted herd can keep a thousand head together. Nor is that all. Prairie-grass can be cut in any quantity for hay, which, together with a little oats or Indian corn, subsists stock, at a trifling cost, throughout the winter.

While, therefore, the bush-farmer is engaged chopping wood, or growing green crop for the consumption of his stock in winter, the prairie-farmer is devoting his time and help and capital to the production of wheat and corn, leaving his stock to feed at large on national or state domain, and fencing in new land at leisure. Need it be said that, while the one is too often sunk to the most degraded state of serfdom, and eats the bread of sorrow, the other is amassing wealth, or speculating in lands or banks, and surrounded with every comfort, and happy? When crops are short in Europe, the one cannot turn his land to use, and derive the benefit; while the other, at a moment's notice, can hire or buy, on time, all the land he pleases, and, with little trouble, sow out twice or thrice the usual breadth, and reap twice or thrice the usual crop at harvest.

This statement is fully borne out by the recent census of the state of Iowa, and by the recent estimated increase in the state of Illinois:

PRODUCTION OF WHEAT, CORN, AND OATS IN IOWA, AND RATIO OF INCREASE DURING SIX YEARS.			
	1850.	1856.	Ratio of Increase.
	Bushels.	Bushels.	Per Cent.
Wheat ..	1,530,561	5,469,516	357
Corn	3,656,799	31,163,362	361
Oats	1,524,345	6,127,329	401
	11,711,725	42,760,207	365

PRODUCTION OF WHEAT, CORN, AND OATS IN ILLINOIS IN 1850, AND ESTIMATED PRODUCTION IN 1857, WITH RATIO OF INCREASE DURING SEVEN YEARS.			
	1850.	1857.	Ratio of Increase.
	Bushels.	Bushels.	Per Cent.
Wheat ..	9,414,575	35,000,000	373
Corn	57,646,934	190,000,000	329
Oats	10,465,904	60,000,000	573
	77,527,463	285,000,000	367

Such is prairie-farming; and its great development is attested further by the rapid growth of Chicago trade. A few years ago, Chicago was a mere trading post, exporting a few thousand bushels of wheat and corn to the lower lakes; but now, it is the greatest primary grain market in the world. Should its trade not be diverted into the Mississippi river, not many years will elapse before the annual exports reach fifty million bushels—a quantity little short of the whole floating grain trade of Europe some few years ago.

With the Chicago grain trade, Canadian capitalists and merchants have been for years identified; and so far last year was the acknowledged superiority of prairie farming over bush farming carried by the leading men of Canada, that farming was said to be ruinous to the province. Whether such is the case or no, would be out of place in this connexion to inquire; but obviously, in a season of low prices, grain production would be maintained upon the prairies when it would be abandoned elsewhere.

There is, besides, other testimony to the disadvantage of Canada, in respect to farming, than that of individual public men—as Isaac Buchanan—and to the superiority of the prairies; and that is furnished by the action of Canadian railroads. Whatever the first intention of these railroads their present purpose is the diversion of western or prairie trade; and, to gain that, they are almost ready to make any sacrifice. Their western terminus is not the limits of British territory at Lake St. Clair, but is established at Chicago, beyond the State of Michigan and the lake of that name. The Victoria bridge at Montreal and the Liverpool and Quebec line of ocean steamers have regard to the present and future trade of Canada as incidental only, and seek, on the one hand, to share with New York the western carrying trade, and British freight and emigration on the other. In the sequel it will be seen whether these ends are ever likely to be attained.

Another characteristic of the North American continent is its thinly settled state. Whether the traveller makes his start, into the interior, from New York, Boston, Philadelphia, Baltimore, New Orleans, or Montreal, he is alike struck with the little progress yet made in the way of settlement and the little land yet brought under cultivation. Here and there well known cities are reached, and left behind; but there are hours of travel during which the marks of civilization are few and far between. Especially is this the case in the never districts, and one sometimes begins to question the utility of railroads at so great a distance from the seaboard. This train of thought is by-and-by disturbed by visible approaches to another great business centre, and the conclusion is irresistible, that but for railroads so vast a country could scarcely be kept together. Still it seems strange, so far, that railroads have done so little to cluster population near them, and inquiry of course is made. A flood of light is thus let in upon the subject, and the secret of the impoverished state of the North American railroad interest made manifest. The railroads are ostensibly projected to open up the country to immigrants and others, and to move merchandize and produce in a cheap, expeditious way, to and from the seaboard; but, in reality, the object of the railroads is to fill the pockets of a few unscrupulous and reckless speculators. These are interested in the sale of lands; and the opening of a railroad through, or even contiguous to their claims, attracts crowds of bargain-hunters from every district, and sales are readily effected at prices all but fabulous. The buyers hold on to their purchases, and puff up the railroads and the district, until, in turn, they get others victimized, and so on. The whole district thus falls speedily into the hands of plunderers, and immigrants with small means have to move onward where railroads and speculators are unknown. Thus a few acres are only bought and sold, and the adjoining lands are not settled: thus the railroad does not pay, and bond and mortgage holders lose their money.

Instances are adduced in which enormous grants of land have been made by Government; land enough, in fact, to pay the railroads, if only a low price were realized; and yet these railroads become bankrupt also. "What," you ask, "is the reason?" and you are told that the mark has been missed by waste and humbug. The lands were not put upon the market in moderate quantities, and sold for the ready money they would bring; but were held at extreme prices; costly advertising was gone into; a numerous surveying-staff organized; and, in the end, the land-sale receipts fell short of the land-

sales' expenses which were incurred. In fact, therefore, so far as the stock-holders are concerned, no advantage is derived, but a positive loss follows from the much spoken-of, much thought-of, grants of land, and John Bull and others get taken in when they least expect it.

Considering the influence already exercised in Europe by the North American produce trade, before even a beginning may be said to have been made in the reclamation of American soil, considerable displacement of European industry in that business, or at least a lower range of prices, may be looked for, so soon as western population becomes more dense, or almost so soon as the present super-abundant and distressed population of the larger cities have taken to country life. This latter agency has been in active operation during the by-gone year, and there is little prospect of relaxation for two or three years to come. Thousands who picked up a precarious living in cities in various ways, when trade was good, have had to choose lately between hiring out to farmers or to starve; and should next harvest (1859) prove propitious, the extra breadth to be put under crop will yield a corresponding increased result, and largely augment the supply of food. The other agency—that of immigration, into the country—is however, for the moment, less active than it has been for several years; but, with the improvement of trade in the English manufacturing districts, there is no doubting that the transatlantic exodus will recover its accustomed force. There are high hopes expressed besides, particularly in Canadian circles, that the Saskatchewan is about to have its prairies peopled, and to raise unheard-of quantities of wheat and corn; but we shall see hereafter that these expectations are premature. People will not be found in any numbers to leave behind them the plains of Illinois and Iowa, and bear a useless transportation charge on everything they want and grow, no matter that the new territory is on British soil. But the aid of that new and fertile region is not needed to give importance to the future greatness of the North American produce trade. That is established on the surest basis, and if the past is a fair criterion of the future, the present annual yield will be fully doubled before European population has made further perceptible increase.

The next natural feature of importance is the climate. The Canadian winter sets in early, and is most severe. Early in November snow begins to fall, and with the exception of a brief partial thaw in January the snow remains upon the ground until the early part of April, if not till May. During the whole of that period there is little wind and little drifting, and fall crops are therefore well protected from the frost. Taking this into account the early winter and late spring in Canada, that province may be expected to continue to produce winter wheat more extensively than other cereals, and to make comparatively little progress in the cultivation of Indian corn or oats or barley.

The prairie winter, on the other hand, is not so early nor of so long continuance, and there being no sheltering hills nor forests, the cold arctic blasts of winter sweep across the country, leaving its surface now and then exposed to the keenest frost. As a consequence, fall crops can only be trusted after open winters; and when the weather has been severe, the judicious farmer either sows out his fields again, or sows out those portions where the sprouts have been killed. Thus, whatever the increase from the prairie district, spring crops in all time must form the staple product, and fall crops be in precarious and limited supply.

These observations are abundantly borne out by Board of Trade reports, and by the relative prices paid for wheat grown in different districts. These prices may be best gathered from the annual list published by the "New York Journal of Commerce," a trustworthy commercial medium.

PRICES OF PRAIRIE WHEAT IN NEW YORK.

	1856.	1857.	1858.
	dol. cts.	dol. cts.	dol. cts.
Western.....	1 90	1 53	1 10

PRICES OF WOODLAND WHEAT IN NEW YORK.

	1856.	1857.	1858.
	dols. cts.	dol. cts.	dol. cts.
Canadian.....	2 12½	1 75	1 20
Michigan.....	2 12½	1 75	1 20
Ohio.....	2 12½	1 75	1 15
Southern.....	2 16	1 75	1 25

The proportion which winter wheat bears to spring wheat at Chicago, the great western grain market, may be best gathered from the official weekly statement of the grain in store in that city. Three weeks at random are as conclusive and far more intelligible than as many hundreds.

GRAIN IN STORE AT CHICAGO.

	Spring Wheat.	Winter Wheat.
	bushels.	bushels.
1857 .. June 6 ..	168,000	29,000
1857 .. Oct. 17 ..	367,000	32,000
1858 .. Jan. 9 ..	428,000	7,000

The relatively high price of Southern wheat, just quoted, it is scarcely necessary to say, is to be attributed to the better climate, although in some cases the better farming and better cleansing process of the South make the only difference. The winter climate of the wheat-growing districts of the Southern states is not inferior to the best in Europe; and the spring and summer have a vegetative force and dryness not probably to be found elsewhere. The Southern farmer, unlike his North or North-western neighbour, is little troubled by the seasons, but commits his seed at leisure to the ground, and at leisure reaps at harvest. Not so the Canadian or the Northern or the prairie farmer. An early frost in autumn may kill or spoil his crop of Indian corn, or bring autumn sowing prematurely to a close; and a wet spring too often leaves insufficient time to dress and sow with proper care. But, these difficulties notwithstanding, it is easy to pick up the choicest small lots of winter wheat in almost any section of the lakes, and especially in the river counties of Illinois. Indeed, if a report published by the Illinois Central Railroad Company were to be believed, there is no wheat grown in Illinois weighing less than 62 lbs. a bushel; but that report is made with the view of inducing immigrants to settle upon railroad lands, and of course is not of much account. The fact rather is, that while there is no better wheat than some grown in Illinois and the West generally, there is at the same time some, or rather, a great deal grown in that district which the trade in Liverpool and Mark-lane know as chicken feed or oats red. Chicago standard wheat at the present time weighs 60lbs. per imperial bushel; but what is known as rejected weighs 40lbs. per imperial bushel only; quite a large deduction from the railroad statement so long foisted on the public. It is right, however, to remark that Western wheat is badly cleaned, and could easily be made to weigh more than it does; but for some time to come no better cleansing system is likely to be introduced.

Besides the dangers, incident to seed-time and harvest, in the colder latitudes of North America, there is only throughout the year six months of open water to the ocean. During the other six months the canals are frozen, and the lakes and rivers wear the same snowy winter aspect as the land. Practically, business makes a pause from the middle of November until the first of May; and no matter how urgently required, the whole surplus cereal crop is kept from going forward to consuming points. This is not generally known to be the case; and the importance of the circumstance, to the British public, will be spoken of hereafter. People have been led to understand that Western and Canadian railroads were available for grain transportation to Atlantic ports; but such is not the fact, and it is a question whether, under the most economical working system, they can ever be so employed. In the first place, by common consent, the value of grain, at the place of growth, is in the main governed by the cost of transportation by the cheapest means to consuming points; and obviously the cheapest means of transportation is by water. If water communication is interrupted during the winter months, the interruption is a matter of time only, and time is as susceptible of being valued for one period as another. If then, during winter, other means of transportation than that of water were sought to be employed, the extra transportation would consist only in the interest of the locked up capital thereby saved, and nothing more; as obviously it would be cheaper, otherwise, to hold back grain until the opening of the water channels of communication in the spring. Now, that addition to the usual charge by water would yield no adequate return to vested capital in railroads, and these therefore cannot be employed.

In the second place, grain, as compared with other produce, is ordinarily of little intrinsic value, and excessive transportation charges in special cases could exercise no influence on general values. If Mark-Lane is supplied with wheat from Leith, by

water, at 40s. per imperial quarter; sixty or seventy shillings per quarter could not be afforded for the same wheat if forwarded to London by special train; while Lothian cattle might be sent indifferently from Leith by rail or steamboat, as taking steamboat risk and time into account, and, above all, the intrinsic value of the cattle, the railroad transportation would probably be the cheaper way of sending these to market.

Thus, while cattle, beef, pork, tallow, lard, and hides, and innumerable other things, are carried eastward by the railroads, through snowy forests and over snowy plains, the staff of life is let alone. Now and again, there is a bare margin for job lots of flour from Chicago to New York, or Boston, or Montreal; but scarcely a sack of wheat or corn is ever carried, during winter, from the region of the lakes to the Atlantic seaboard.

Further light will, perhaps, be thrown upon this important question by a few figures. The distance between Chicago and New York, by railroad, we shall say, is one thousand miles, and by lake and Erie canal, fifteen hundred miles. During the past summer, wheat was carried, by lake and canal, from Chicago to New York, at fifteen cents, or seven pence halfpenny per sixty pounds, and flour at fifty cents, or two shillings per barrel. By railroad the regular tariff would have been—wheat fifty cents, or two shillings per bushel of sixty pounds, and flour one dollar and fifty-five cents, or six shillings and five-pence halfpenny per barrel.

Or, again: Chicago is one thousand miles distant from New York by railroad, and fifteen hundred miles by water. The cost per ton per mile, by railroad, would be three farthings, and the cost by water one-sixth of a penny only. The cost of a ton of wheat, flour, or any other thing, by the two different ways, would have been as follows:

By Railroad.	By Water.
From Chicago to New York.	From Chicago to New York.
1,000 miles at $\frac{3}{4}$ d. £3 2s. 6d.	1,500 miles at $\frac{1}{6}$ d., £1 0s. 10d.

The disadvantage of western railroads, in the matter of transporting grain to the seaboard, is therefore patent, and there is little hope of their ever being so employed.

Before leaving this branch of the subject, it is proper to remark that a pamphlet appeared in Buffalo last summer, directing the attention of American railroad companies to the advantage and economy that would result from a railroad clearing house on the English model; and the writer, Mr. Dartnell, went the length of saying, that with a clearing house, American railroads could compete successfully with water carriage. After what has just been stated, the effort at competition must, in the nature of things, be a hopeless one; and is Mr. Dartnell not aware that there are insuperable state difficulties, in the way of securing compulsory united action among American railroads? In Canada even, everything is so inextricably interwoven with politics, or political parties, that it is not obligatory on one railroad to connect and transport the passengers and baggage or the freight of any other; and it is questionable whether such a proposition would be entertained by the provincial Legislature.

The fact then that Western and Canadian railroads can do nothing towards the development of the agricultural resources of the West, further than transport immigrants and baggage, the question naturally arises, What is to be done? The enlargement of the Erie, the Welland, and the St. Lawrence canals; the construction of the Caughnawaga to connect the waters of the St. Lawrence with the Hudson river; the opening of the Ottawa into Lake Huron, and the connection of Lake Ontario with the Georgian Bay;—these, all of these together, can do nothing, when perfected, towards the movement of a single bag of wheat to the Atlantic seaboard, after the 15th November, when insurances expire upon the lakes. The Victoria bridge at Montreal, that other leviathan of British folly, is to be more powerless even than the frozen lakes and rivers; and at some future time, when Europe feels the pinch of hunger, while the West is filled with plenty, must we wait contentedly for bread, until the cold arctic breath of Illinois has been warmed and melted in the summer sun.

The last natural feature of the North American continent, which it is necessary to name in this connection, is the great watercourse, reaching from the Gulf of the St. Lawrence, back to the Saskatchewan and the sources of the Missouri in the Rocky Mountains, and diverging southward into

one great trunk stream: mingling the waters of the St. Lawrence and the Mississippi, in the Gulf of Mexico.

The line of this watercourse is easily traced upon the map, beginning either with the Gulf of the St. Lawrence or the Gulf of Mexico. Starting from the latter, and following the course of the Mississippi some thirteen hundred miles, we reach the broad outline of a navigable river, winding round the extreme southern point of the State of Illinois, and forming the line of separation between Kentucky and that State. Leaving the Mississippi, and following the course of that river—the Ohio—we find it skirting Indiana and Ohio, and separating these States from Kentucky and Virginia, and ultimately, by canals, forming connections with Lake Erie. The principal rivers discharging into the Ohio are the Cumberland and the Tennessee, both of which open up Kentucky to the river trade, and the Wabash, which is navigable for nearly four hundred miles along the boundary line of Illinois and Indiana. Mr. Ellet, in his report to Congress, says, that by the outlay of a few million dollars in the improvement of the channels of the Mississippi and Ohio rivers, large ocean ships could find their way to Pittsburgh in Pennsylvania, a river distance, inland, of over two thousand miles. As it is, the whole country beyond Pittsburgh to Lake Erie, and the country watered by the Wabash, and the other rivers of the Ohio, are alike tributary to New Orleans, and numerous well appointed fleets of steam-boats bear testimony to the existence of an enormous trade.

Returning to the Mississippi, we reach the confluence of the Missouri, some two hundred miles higher up than Cairo. The Missouri, at that point, forms by far the most lengthened and important arm of the Mississippi, and that circumstance has led travellers to express regret that Missouri has not been the name of the great trunk river. That, however, is a small matter, but points to the magnitude of the almost unknown region, watered by the Missouri and its numerous tributaries. It has been said that the Missouri forms a junction with the Mississippi, after three thousand miles meandering from its sources in the Rocky Mountains, and opens to all but uninterrupted navigation two thousand five hundred miles of fertile country. The principal tributaries are the White Earth, the Yellow Stone, the Platte, the Kansas, and the Osage; and in congressional reports, the whole area drained by the Missouri, back from the junction with the Mississippi, is said to be in the neighbourhood of six hundred thousand square miles.

The Mississippi, above the confluence of the Missouri, is said, on the same authority, to drain 184,500 square miles; and is fed by the Illinois, the Des Moines, the St. Croix, and innumerable other navigable rivers, which rise in Iowa, Wisconsin, and Minnesota. Short portages, it is scarcely necessary to say, connect the Upper Mississippi with the Red River of the north, Lake Winnepeg, and the Saskatchewan—watercourses which perhaps drain a greater and not less fertile area than the united areas of the Missouri and Upper Mississippi.

Thus the most fertile portion of the North American Continent—the north, west, and south—is traversed by innumerable great rivers, all of which, ultimately at least, will unite their waters in the channel of the Mississippi; and when that channel has attracted the capital and ingenious resource of the United States, the largest ships afloat, not excepting the Great Eastern, may safely steam two thousand miles, or more, inland from the Gulf of Mexico.*

* I.—EXTREME DEPTHS OF THE MISSISSIPPI IN THE HIGH WATER OF 1850.

Points of observation—	Feet.
Cape Girardeau, about 1½ mile above.	66 5
Above mouth of the Ohio River, about two miles.	77 5
At M-Master's plantation, about 11 miles below New Orleans.	100 0
Sauve's plantation, above the crevasse	135 0
Under the Bluffs, Grand Gulf.	200 0

II.—SECTION OF THE MISSISSIPPI BETWEEN BANKS IN THE HIGH WATER OF 1850.

Points of observation—	Feet.
Below mouth of the Ohio River, about 1 mile	235-333
Below Memphis, half a mile	143-212
Average Section from the mouth of the Ohio to New Orleans (thirty different observations)	260-000

—Ellet's Congressional Report.

Following down the line of the Upper Mississippi upon the map, at a short distance higher up than Alton and St. Louis, the Illinois River forms a junction with the Mississippi. Following the course of that river to La Salle, the line becomes fainter, and extends to Chicago, at the head of Lake Michigan. That faintness is meant to mark the Illinois and Michigau Canal, which connects the Illinois River with Lake Michigan—the waters of the St. Lawrence with the waters of the Mississippi.

At Chicago we reach the present head of the navigation of the eastern section of the great North American watercourse: and subsequent remarks have special reference to this perhaps arbitrary division of the country, which it will be desirable to keep in view.

Passing along Lake Michigan we reach Sault St. Marie, and enter Lake Superior. Glancing westward from the head of Lake Superior, a bend of the Mississippi is in close proximity, and distant only forty miles. Water communication formed across that neck of land, the question then is, whether the trade of Lake Superior will pass towards the Gulf of Mexico or towards the St. Lawrence? and, water communication formed between the Mississippi and the Red River, will the trade of the new British settlement seek the one seaboard route or the other? This is not the place to answer; and it is enough to point out the new connections that will probably at some future day be formed.

Leaving Sault St. Marie, and keeping close to the Manitoulin shore, and the British side, we enter the Georgian Bay. To the north of the Georgian Bay the French River leads to Lake Nipissing; Lake Nipissing to the Ottawa River, and the Ottawa River to the vicinity of Montreal, by a saving in distance of several hundred miles. It is proposed to adapt that channel to the lake shipping trade, with the view of shortening the distance to the seaboard, and carrying produce past the Erie Canal and New York. Somewhat lower down the Georgian Bay, the Severn River is observed connecting with Lake Simcoe, and it is proposed to form a canal from that lake to Lake Ontario, either by way of Toronto or Peterborough. A canal across that neck of land would cut off the circuit by Lake Erie and the Welland Canal, and still give produce the choice of markets at Buffalo, Oswego, or Montreal.

Passing from the Georgian Bay we enter Lake Huron, the river and Lake St. Clair, and Lake Erie. At the western extremity of Lake Erie we find the Ohio Canal, leading to the Mississippi, and offering thereby the choice of markets south, at New Orleans. Towards the eastern extremity of Lake Erie we find Buffalo, the western end of the well-known Erie Canal, which opens to western produce a cheap through means of transportation to New York. To the left of Buffalo a neck of land is observable between Lake Erie and Lake Ontario, and through that neck the Welland Canal extends. The great object of that canal was to divert Western trade, past Buffalo towards the lower British port of Montreal. Down Lake Ontario, and towards the middle of the Southern shore, we reach Oswego, an American port, to which there is a branch of the Erie Canal. Passing from Lake Ontario we enter the St. Lawrence River proper, pass the confluence of the Ottawa, and come to the city of Montreal. Before reaching Montreal we pass the village of Caughnawaga, from which a canal has been projected to Lake Champlain—a little eastward—and Albany; or rather to the Hudson river. The object of that canal is the diversion of Western produce from Chicago and other ports, through the British canals, rather than through those of the United States; but the project is not likely to be speedily entertained. At Montreal—of course we do not see it on the map—the Victoria Bridge crosses the St. Lawrence river, and presents one more competing channel for the transportation of passengers, merchandise, and produce, east and west. Lower down the St. Lawrence we pass Quebec; and finally approach the gulf and the Atlantic ocean.

The distances from one point to another of the Eastern and Southern sections of the watercourse may be briefly summed, viz., thus:

EASTERN SECTION.

1. From Chicago to New York, by way of the Lakes to Buffalo, the Erie Canal, and the Hudson River, 1,418 miles.
2. From Chicago to New York, by way of the Lakes and Welland Canal to Oswego, and thence by the Erie Canal and the Hudson River, 1,410 miles.
3. From Chicago to New York, by way of the Lakes, the

Welland Canal, the St. Lawrence, the Caughnawaga, and Champlain canals, and Hudson River, 1,632 miles.

4. From Chicago to Montreal, by the lakes and canals, 1,278 miles.—*Mc. Alpine's Report.*

SOUTHERN SECTION.

1. From Cairo to New Orleans, by river, 1,040 miles.
2. From St. Louis to New Orleans, by river, 1,212 miles.
3. From Chicago to St. Louis, by Illinois and Michigan Canal and Illinois River, 326 miles.
4. From Chicago to St. Louis, by railroad, 283 miles.
5. From Chicago to New Orleans, by Illinois and Michigan Canal and Illinois and Mississippi rivers, 1,538 miles.
6. From Chicago to New Orleans, by railroad to St. Louis, and from St. Louis to Mississippi river, 1,495 miles.—*Colton's distances.*

Having thus gone through what has been termed the natural characteristics of the North American continent, it remains to turn to the characteristics of the business system.

To that end it will scarcely be considered necessary to go so far back as the formation of the Federal Government; but as the state of the union at the present day is very much analogous to what it then was—in fact, to what it was in colonial times—the clearest, and at the same time the most fundamental illustration would otherwise be lost. In colonial times a community was formed; that community received additions to its numbers, both from natural increase and from immigration; and in turn that community formed the nucleus of others. That is to say, people left the first-formed towns and hamlets, and settled on the verge, if not altogether outside the limits, of civilization among the Indians; and what one day was outside the limits of civilization was inside on another. Civilization at the earliest period of colonial history was an advancing line, driving back barbarism, and such it is just now; and since the earlier movements it has made great progress.

On this theory, much more than is involved in the business system of the North American continent could be accounted for. People, or rather the superabundant population, of the older states and provinces, moved simultaneously from every section upon a given point or district. Each person was strange to the other; no restraint was known nor recognized, but the loose provisions of the loosest law; and all were bent on making money. San Francisco, New Orleans, Chicago, and other cities that might be named, are examples of what obtains to a greater or less extent throughout the whole country. There is little confidence between man and man, and what would be regarded in England as odd, if not irregular and absurd, in the way of business, is necessarily resorted to, both in the British provinces and the United States. For example: A stranger from the country goes to New York to buy goods. He goes into a dry goods or grocery, or other store, and says he comes from such and such a place. Perhaps that place is Chicago, and perhaps the parties called on—as many New Yorkers have done of late—have made up their minds to sell nothing west of Buffalo; and of course, no trade takes place. Supposing, however, that the parties called on have no such rule; then the stranger is asked about his means, extent of business, and so on; and his statement is written down in a book for that special purpose, and signed by him. His order is then taken: but, before being filled, Douglas's agency or McKillop's is visited by the merchant. He tells the story of his customer, and finds whether there is aught against his name in the place he comes from. If the register is clean, the goods are sent away; but if misrepresentation has been made, the transaction drops, and the country customer may be passed over to a magistrate. Should misrepresentation be discovered after the goods have been sent away, and payment not be forthcoming at the promised time, criminal process may then issue, on the written statement under which the goods were sold. This practice is not altogether peculiar to the country trade, but obtains also in the local trade of the large business cities; and to such method has business been reduced in New York, that bill brokers have been able to publish public annual volumes, with lists of city merchants' names, giving the extent to which each may be safely trusted, and the market discount at which each name is taken on bills of exchange.

Such a style of business looks well on paper, and while it may be the best that could be practised in a new country, the system bears no comparison, in point of safety, to the open

self-relying English practice. No matter how full the register of Douglas or McKillop, no matter what their means of information—business conducted by virtue of their record, or their judgment, is like service performed by a substitute; and proverbially if things are wanted to be done well they must not be left to be done by others. The English merchant, or his representative, trusts nobody; but sees the business of his customer, makes inquiries, and forms opinions for himself; and, if now and then he is taken in, the circumstance leads to circumspection in the future; and little noise transpires. The American business mechanism, although unsuited to the domestic English trade, cannot be too freely used in transactions with parties at the other side; as any house in bad repute, or unknown to the agencies, should, as a matter of business-principle, be let alone.

The peculiar unknown elements of the North American commercial class secure footing for great numbers of mere adventurers. The run of these cannot possibly be kept by the shrewdest agency; and crowds of men, of whom nothing can be learned, infest, and often rule, the stock and corn exchange, and other marts of trade. These men of no reputation—and no doubt, in the majority of cases, of no means—lose nothing by unfortunate reckless trading; but have the certainty of making money, if they start the market, and sell out to those who must foot the bill. Strange to say the law sustains, or rather does not extinguish, such a system, and such a class. Not to meet engagements when these mature is certainly no crime in the United States, and too often is lightly thought of in the American dependencies of the British crown; and even when circumstances or convenience oblige a man to burst, he has no bankrupt law to face. Assignment directly to a friend, or indirectly to a wife, stops all process; and by-and-by defaulters make another start, among old friends, if they can do better by moving elsewhere.

The banking class, perhaps, more than any other, is made up of such nondescripts; and in the West particularly, so well is the art of money making understood, that people usually look out every season for banking houses suspending temporarily when the fall business is fairly over. To constitute an American banker, nothing more is needed than showy premises, a few clerks, and some small notes and change in the window. Instances have been brought to light where young banking houses have had the window funds on loan, with the understanding that the lender should share all business profits. Not necessarily being an issuer of notes, an American banker may confine his business to deposits, discounting bills, and negotiating real estate, and the fools not being all dead yet, a safe lucrative business is set agoing.

To issue notes some State forms have usually to be observed, and if it is obligatory that the notes should be secured by State bonds, or otherwise the possession of these bonds becomes the first care of intending plunderers, and occasionally the means employed for that end excel every other form of knavery. Usually, or rather invariably, the promoters of a new bank are interested in some others, some thousand miles away, and the notes of these, which stand at par in the note reporters', are employed to buy the stocks. The bank then opens; scatters its issues as far away as possible, and deposits soon supply sufficient capital to refund advances and furnish funds to make the speculation pay.

In the west particularly it is a well acknowledged fact that legitimate trade has no assistance and almost no convenience—unless the privilege of depositing money is considered such—the great mission of the banking system being to promote improvements and give value to real estate. Occasions innumerable could be adduced wherein the arm of productive labour has stayed its functions; wherein general business has been paralyzed, and hungry thousands turned upon the streets because legitimate banking business would not be done. That and other evils of the system have been noticed in the last and previous messages of the President of the United States; and until Congress can so far infringe the sovereignty of the individual States as to provide general banking and bankrupt laws, American trade and banking swindlers will remain unpunished.

From these imputations it is scarcely necessary to relieve the banking classes of New York and other eastern States, as generally these are known to be men of another stamp, not generally inferior in character and business system to the best

in Europe. But these form a mere fraction of the whole, and their very virtues are a standing condemnation of the other's sin.

Canada must also be exempted from the more strictly western censure, as there "shipplaster" notes are at least unknown. There also banking capital is in the main employed in strictly business ways, although there is much to reform in the distribution of banking favours. A man of business, to get on in Canada, is too much under the necessity of being a bank proprietor, if not director, or the friend of either; and so long as that state of things continues, little comparative progress can be made in the development and building up of provincial trade.

PRODUCTIONS AND PECULIARITIES OF THE NORTH AMERICAN WATERCOURSES.

In the previous communication the great watercourse of the North American continent was divided into two sections—the first embracing the Mississippi river and its tributaries; the second embracing the lakes and the St. Lawrence river: St. Louis the centre point and shipping port of the one; and Chicago the centre point and shipping port of the other. It is now proposed to enumerate the productions of both sections, and to speak of some of the peculiarities of the trade in the different articles.

Beginning with New Orleans, the first consideration is the imports and exports of that city, and these are furnished by the New Orleans *Price Current*, under the auspices of the Board of Trade.

Statement of the principal grain receipts at New Orleans, from the interior, for the years ending 1st September:—

	WHEAT.	FLOUR.	CORN.
	Barrels and sacks.	Barrels.	Sacks.
1858.....	401,000	1,538,000	1,289,000
1857.....	775,000	1,290,000	1,437,000
1856.....	869,000	1,120,000	1,990,000

Statement of the principal grain exports from New Orleans, September 1, 1857, to July 1, 1858—

	FLOUR.	CORN.
	Barrels.	Sacks.
New York	127,600	73,400
Boston	230,200	26,400
Philadelphia	—	3,500
Other United States ports ..	164,500	209,500
Great Britain.....	264,000	393,800
France and continent ...	94,400	—
Cuba	3,200	90,800
Other foreign ports	118,500	30,400
	1,002,400	832,800

The supplies of New Orleans are chiefly furnished by St. Louis and Cincinnati. Cairo and Alton of southern Illinois, and Louisville of Kentucky, are however large contributors. But New Orleans does not receive the whole Ohio river and upper Mississippi river shipments: a considerable portion goes from Memphis by railway to Charleston and Savannah. The total southern grain movement from St. Louis and Cincinnati and the other ports of the Mississippi and Ohio rivers may be summed up thus for 1857—

Exported from	FLOUR.	WHEAT.	CORN.
	Barrels.	Bushels.	Bushels.
St. Louis	845,600	1,331,400	859,200
Cincinnati.....	416,700	394,900	162,900
Other ports	631,100	863,100	511,000

Total movement south 1,893,400 2,589,400 1,533,100

New York and Montreal form the Atlantic outlets of the eastern section of the watercourse; and no account being accessible of the railway traffic from Buffalo and other points, the tidewater receipts at Albany represent the eastern movement towards New York; and the movement towards Montreal is borne on the returns of the trade and navigation of the province.

Statement of tidewater receipts at Albany, from the opening to the closing of the canal:—

	FLOUR.	WHEAT.	CORN.
	Barrels.	Bushels.	Bushels.
1857....	835,500	5,763,400	5,515,900
1856....	1,130,500	11,776,300	9,537,700
1855....	1,290,100	5,426,200	9,343,700

	RYE. Bushels.	BARLEY. Bushels.	OATS. Bushels.
1857	169,400	1,727,200	2,966,300
1856	1,285,500	2,082,800	6,060,800
1855	632,300	1,674,400	4,537,000

Statement of receipts at Montreal, from the lake and river districts, by canal and river and Grand Trunk Railroad:—

	FLOUR. Barrels.	WHEAT. Bushels.	CORN. Bushels.
1857	637,000	1,708,900	383,100
1856	712,000	1,546,300	637,900

The supplies at tidewater and at Montreal are chiefly furnished by Chicago and Milwaukee, and the other ports of Lake Michigan; the quantity supplied by Detroit and Canada West being comparatively trifling. The whole surplus of the eastern section does not, however, find its way to these two points, but the numerous railroads from Lake Erie and Lake Ontario share to some extent in the distribution on the Atlantic seaboard. The total eastern grain movement from Chicago and other ports may be summed up thus—

	1857. FLOUR. Barrels.	WHEAT. Bushels.	CORN. Bushels.	OTHER GRAIN. Bushels.
Western terminus, Baltimore and Ohio Railroad.	426,801..	— ..	— ..	256,183
Western terminus, Pennsylvania Central	351,011..	— ..	— ..	206,793
Dunkirk	354,072..	93,443..	114,652..	—
Buffalo	925,411..	8,363,815..	5,720,413..	1,321,406
Suspension Bridge	180,194..	148,138..	— ..	—
Oswego	101,363..	5,535,026..	2,003,992..	370,240
Ogdensburg	361,578..	598,523..	517,076..	14,740
Cape Vincent	60,472..	477,375..	40,537..	49,408
Montreal	637,052..	1,708,965..	383,162..	38,165

Total eastwards 3,397,954 16,763,285 8,779,832 2,256,944

The aggregate Western grain movement, east and south, so far as it can be ascertained, amounts therefore to some sixty million bushels.

	1857. FLOUR. Barrels.	WHEAT. Bushels.	CORN. Bushels.	OTHER GRAIN. Bushels.
Eastward	3,397,954..	16,763,285..	8,779,832..	2,256,944
Southward	1,893,400..	2,589,400..	1,533,100..	—

Total movement 5,291,354 19,352,685 10,512,932 2,256,944

If, in connexion with these general statements of the movement of produce east and south, we take the special cases of the trade of St. Louis and Chicago, it will be easy to arrive at something like a comprehensive idea of the character of western trade, and to estimate, with something like exactness, the particular transit course which ultimately that trade must take.

St. Louis, as has been already stated, is situated on the Mississippi river, about midway between the confluence of the Ohio and the confluence of the Missouri. The junction of the last-named river is only a short distance higher up, and St. Louis forms therefore the natural connecting link between the country watered by the Missouri and its tributaries, and New York and New Orleans. The merchant at Council Bluffs does not generally buy dry goods, or groceries, or hardware on the eastern or southern seaboard, but almost invariably at St. Louis; and the Missouri river merchant, or agriculturist, seldom thinks of sending grain or produce elsewhere. For many years to come this will continue to be the case, as St. Louis, unlike other growing western cities, has not wasted an undue proportion of its income in speculative, unproductive, purchases of land, but has given to business its first and greatest care.

In 1855 and 1856 (no later account published) the grain receipts at St. Louis from the Missouri river were as follows:—

	1855.	1856.
Flour	barrels 6,120	4,745
Wheat	sacks 129,920	232,731
"	barrels 498	822
Corn	sacks 14,487	7,574
Oats	" 1,409	5,331

A short distance higher up the Mississippi than the con-

fluence of the Missouri, the Illinois river opens up to the St. Louis trade perhaps the most fertile and best cultivated portion of Illinois; and between the Illinois-river towns and St. Louis there are numerous well-appointed steamers for the conveyance of freight and passengers. The steam-boat distance from St. Louis to the head of the Illinois river is two hundred and twenty-six miles, and the canal distance from the head of the Illinois river to Chicago is one hundred miles; and St. Louis has therefore the control of rather more than two-thirds of the navigation between the Mississippi and the head of the Lake Michigan, at Chicago. Due consideration has not hitherto been given to this advantage which St. Louis has in the diversion of Illinois produce from its Chicago rival. St. Louis is situated to drain the produce of two-thirds of the interior of Illinois, not by canal boat drawn by horses, but by river steamers; and Chicago is situated to drain only one hundred miles of the same district, and that by horse canal, which every now and then gives way, and temporarily puts a stop to business operations. In 1855 and 1856 (no later account published) the grain receipts at St. Louis, from the Illinois river, were as follows:—

	1855.	1856.
Flour	barrels 51,188	45,755
Wheat	sacks 698,336	594,434
"	barrels 13,152	2,044
Coru	sacks 956,351	216,376
Oats	" 389,705	152,623

Beyond the confluence of the Illinois river the Mississippi stretches north to the neighbourhood of the Red River and Lake Superior, and receives the waters of numerous tributaries. Produce grown on the borders of the Upper Mississippi, above the confluence of the Illinois, cannot in the nature of things be moved cheaper than upon the river in the direction of St. Louis, and St. Louis stands thus in precisely the same relation to the Upper Mississippi as it does to the Illinois river and the Missouri. Should the Mississippi become connected with the Red River and the Saskatchewan, still the most available and cheapest route for the British settlers to move produce to the seaboard would be by the Mississippi river to St. Louis; and should the Mississippi become connected with Lake Superior no distributing influence would be introduced, as mere distance would be outweighed by considerations of another kind, which will be adverted to hereafter. In 1855 and 1856 (no later account published) the grain receipts at St. Louis from the Upper Mississippi were as follows:—

	1855.	1856.
Flour	barrels 273,378	227,361
Wheat	sacks 878,997	863,336
"	barrels 1,956	436
Corn	sacks 336,727	245,328
Oats	" 557,932	298,879

Besides being most favourably situated for receiving supplies of produce by the Missouri, from the interior of Illinois, by the Illinois river, and from the Upper Mississippi by the river of that name, St. Louis is also as favourably situated, with respect to railroads, as any other western city. The St. Louis, Alton, and Chicago Railroad is laid down in the vicinity of the Illinois river, from Chicago to St. Louis; the Terre Haute and Alton Railroad, from the Wabash, across the State of Illinois, to the same point; and the Ohio and Mississippi Railroad, in the same direction, from the same river, but lower down. These railroads intersect the Illinois Central, both the branch and trunk lines, and connect with all the railroads of Illinois, and thereby give to St. Louis the control of the produce of Illinois. On the other hand, the Pacific and the North Missouri Railroads give promise, at no remote period, to bring forward large supplies of produce from the interior of Missouri and the contiguous States. These contiguous States are yet in infancy, scarcely producing beyond their own wants; and a few years must intervene before their yield attracts much notice. The following were the grain receipts at St. Louis from these different railroads for the year ending December, 1857:—

	RAILROAD RECEIPTS OF FLOUR AT ST. LOUIS, 1857.	
	Barrels.	Sacks.
By Chicago and Alton Railroad	9,900	2,500
" Terre Haute and Alton do	38,700	32,700
" Ohio and Mississippi do	21,600	17,800
" Pacific do	5,800	—
" North Pacific do	4,700	—
	<hr/>	<hr/>
	80,700	53,000

RAILROAD RECEIPTS OF WHEAT AT ST. LOUIS, 1857.

	Sacks (2 bushels).
By Chicago and Alton Railroad.....	62,000
„ Terre Haute and Alton do.....	32,700
„ Ohio and Mississippi do.....	41,600
„ Pacific do.....	28,000
„ North Pacific do.....	27,400
	191,700

RAILROAD RECEIPTS OF CORN AT ST. LOUIS, 1857.

	Sacks (2 bushels).
By Chicago and Alton Railroad.....	30,300
„ Terre Haute and Alton do.....	12,200
„ Ohio and Mississippi do.....	6,500
„ Pacific do.....	1,800
„ North Pacific do.....	4,200
	55,000

The aggregate grain receipts at St. Louis, in 1857, were the following:—

Flour.....	barrels	458,981
„	sacks	46,523
Wheat.....	„	1,421,990
„	barrels	1,791
„	bushels	34,200
Corn.....	sacks	1,143,414
„	barrels	198,958
Oats.....	sacks	563,530
„	bushels	90,827

The aggregate grain shipments from St. Louis to New Orleans, in 1856, no later account published, were the following:—

Flour*	barrels	845,600
Wheat	sacks	1,331,400
Corn.....	„	859,200

* The St. Louis city manufacture of flour, in 1856, was 678,496 barrels.

Chicago, as has been already stated, stands at the head of the navigation of Lake Michigan, and connects with the Illinois river and the Mississippi by the Illinois and Michigan Canal. Unlike St. Louis, the Illinois and Michigan canal is the only water tributary of the Chicago produce trade. Not one great river flows into Lake Michigan, and each and all of its important towns and cities owe their present and prospective greatness to the railroads. Before the railroad era, the shores of Lake Michigan were little visited and thinly settled; and since then people have flocked to them in crowds, and built villages, towns, and cities, the public and private edifices and streets of some of which are not surpassed in Europe. With the destruction of the railroad interest, or with its produce-carrying diverted into other channels, existing industries would receive a fatal blow, and the people be obliged to move elsewhere, or to make their living in a different way. Railroads first gave marketable value to the unlimited supply of western lands; and when superseded by cheaper and more efficient means of transit, land and its collateral offshoots must necessarily decline in value.

These are not unadvised remarks. Traverse the Illinois and Wisconsin shore of Lake Michigan, or, what is more, go inland some distance from the shore; and it is quite surprising that the farmer, and the plough, and the fenced and cultivated field are so seldom met with. Everywhere throughout the district there is abundant evidence that land is held for higher purposes than cultivation. Outside of every little knot of country-houses new streets are graded, and surveyors' rods and poles scattered round; and in the vicinity of the larger towns immense tracks remain uncultivated, in the expectation that sooner or later they will be required to build upon. Chicago, for example, which some day or other may turn out to have a much less population than is generally supposed, has its city limits laid out on something like the scale of London; and so very valuable are contiguous lands esteemed, that Chicago is supplied with vegetables from Cincinnati and St. Louis. Vegetables can be raised, not quite so early, but in the highest perfection within the Chicago city limits, and outside the limits also; but hitherto land has been held at too high a price to yield sufficient profit, to the market-gardener, or cabbage-growing has been too democratic for the go-ahead Chicago people.

In short, until the railroad period, the eastern section of the State of Illinois was in bad repute, and immigrants preferred settling on lands contiguous to the Mississippi or the Illinois; and in those days people settled down to work, and to turn the prairie to some account. These agricultural beginnings grew apace, and to the unwearied industry of the early river settlers the grain-producing name of Illinois is wholly owing. The other sections of the State only now begin to attract attention, and to be made available by local railroad transit; and while making rapid agricultural progress, the earlier settled districts receive additions to their working hands, and break up prairie in an undiminished greater ratio.

Of the twelve most thickly settled counties of Illinois, the Western and Eastern sections have the following population—

	Western.	Intermediate.	Eastern.
Peoria....	1,031*	Winnebago.... 620	Cook.. 2,396
Adams....	937	—	Kane.. 1,049
Madison..	918	—	McHenry 878
St. Clair..	916	—	—
Rock Island	862	—	—
Knox....	843	—	—
Io Davis..	822	—	—
Morgan..	830	—	—

* Inhabitants to the square mile—State Census, 1855.

These western counties are of the early character just spoken of; five of them skirting the Mississippi, and three—Peoria, Knox, and Morgan—contiguous to the Illinois. The eastern counties embrace Chicago and the town and village populations that cluster round that city. These latter are more mechanical or speculative in their avocations than the others; and although McHenry is the greatest wheat-producing county in the state, the agricultural class are but a fraction of the whole. In the western counties it is otherwise. There the people are not crowded up in large communities, but are scattered, and agriculture is the occupation of the mass.

The following is the wheat and corn production of these twelve counties—Census, 1850:

	Wheat. bush.	Corn. bush.
Western Counties.		
Peoria.....	185,000	1,013,000
Adams.....	502,000	2,092,000
Madison.....	38,000	1,153,000
St. Clair.....	224,000	1,102,000
Rock Island.....	83,000	215,000
Knox.....	216,000	1,570,000
Io Davis.....	207,000	220,000
Morgan.....	91,000	2,693,000
Intermediate County.		
Winnebago.....	316,000	281,000
Eastern Counties.		
Cook.....	236,000	429,000
Kane.....	316,000	337,000
McHenry.....	562,000	301,000

These are important considerations, and what applies to Illinois applies to Wisconsin also.

The great producing districts are thus contiguous to the Mississippi; and to move produce to Lake Michigan, is to divert it from an available and open watercourse, and to incur expensive railroad transit. And further, those sections of Illinois and Wisconsin opened up by railroads are as contiguous to the Mississippi as to the lakes. Which course, then, will Western produce take in future?

The Grand Trunk Railroad Company, and the advocates of the Erie Canal and St. Lawrence routes, have evidently not thought deeply on this subject, but have concluded that, as Western trade has taken the Chicago and Milwaukee channels, it will there remain. Such will likely be the case until Americans themselves, if not the capitalists of Europe, are informed of the anomalous state of things that now obtains, and then it is more than likely that the route offering the cheapest and most convenient means of transit will be chosen. That the Mississippi is the cheapest and the shortest route is manifest from the fact that the growing districts are upon its banks, that railroad transit is not required, and that St. Louis is nearer to New Orleans than Chicago is to New

York. Above all, when the lakes and canals are closed for the winter months, the Mississippi still continues open; and that Western produce, for whose transit the Grand Trunk Railroad, and Canada, and New York have spent so much, may take to itself wings, and flee away. Let another period of scarcity occur in Europe, and Americans and Europeans will appear in Illinois; and while the lakes, and the St. Lawrence, and the Erie canal are ice-bound, the railroads of Illinois, and Wisconsin, and Missouri, will be used to drain that produce (upon which the hopes of Canada and New York depend) to the shipping ports of Cairo and St. Louis; and not only will scarcity in Europe be provided for six months sooner than would have been the case before, but the general supply of food will be more fully equalized among the consuming masses of America and Europe.

But, returning to the question, it may be asked why trade has taken the Chicago route, instead of that by the Mississippi, when the latter is the best? Happily that question can be answered. St. Louis hitherto has maintained a high standard for every kind of cereal product, and Chicago has practically had no standard of any kind. As a consequence, Chicago has been a ready market for every kind of produce, good or bad, while St. Louis has restricted its receipts to special kinds. That is the secret of the course of trade being in the one direction, in place of being in the other. Western farmers and country merchants were, to a large extent, debarred from St. Louis, even though adjacent to it; and in sending stuff to Chicago, they could not help themselves. Here is a plain illustration of the case, and of the point involved. The produce of the Scotch herring fisheries does not find its way to London, as Londoners prefer herrings cured in a different way, if not different herrings altogether; and although Scotch fishing stations are nearer to London than to the German or the Russian ports, still the herrings find their way to the latter. Surely, from such a circumstance, it could never be inferred that Stettin or Riga is nearer Peterhead than London is, or that the Scotch herring trade could not, under any circumstances, be diverted into Billingsgate. Just so with Western trade. The existence of the Mississippi route has been uniformly ignored; and if ever spoken of, the most disparaging terms of unsuitableness and inferiority have been used; and no man has yet been bold enough to call in question the universally received opinion that no change whatever is to be apprehended in the course of Western trade. Chicago is universally regarded as the entrepôt of the great Northwest, and people are only busied helping forward the most stupendous schemes of shortening distance between Chicago and the Atlantic seaboard.

But strange to say, that policy to which Chicago owes the

growth of its produce trade is being departed from. For the past year or more, repeated efforts have been made to establish grades of wheat, and corn, and flour; but every effort hitherto has failed. No sooner was it determined that wheat and corn of a particular quality should form "a standard," than dissatisfaction was expressed, and modification of some kind or other speedily introduced. The last change provides for the measured bushel being weighed, and standard wheat is classed at sixty pounds per imperial bushel; and whether this last determination of the Board of Trade is likely to be observed for any length of time, it is needless in this connection to inquire; but the tendency to an adoption of the exclusive system is very manifest.

The Chicago people are not satisfied to be the mere medium of communication for so many million bushels of grain per annum, but are to insist hereafter that each kind of grain be equal to a given weight; and the object of that rule, he it observed, is not to measure values more closely than before (as no such rule obtains in Buffalo, Oswego, or New York, where Chicago grain is sent), but to oblige farmers to bring better stuff to market. Here, in England, it has always been believed that the farmer was more interested than other people in the quality of his own crop; but it would seem to be otherwise in Illinois. There, the farmer appears to be standing in his own light—perhaps growing spring wheat when he should be growing winter, or growing light wheat when he should be growing heavy, and, besides giving a bad name to Chicago grain, he does not seem to make the profit from his occupation that he should do. These mistakes the action of the Chicago Board of Trade designs to remedy; overlooking, however, the important fact that the previous similar action of the St. Louis Board of Trade was the main condition of the development of Chicago trade at all. St. Louis did in effect what Chicago now attempts to do, and instead of no more inferior Western wheat and corn being produced, and no more inferior wheat being manufactured into flour, the settler on the banks of the Mississippi continued to break up and crop prairie in such way as his circumstances would afford, and the miller never turned grist from his mill-door. The result was, that the produce rejected by St. Louis found another market—at Chicago—and instead of all the best lots going to the one market, and the inferior lots to the other, the bad and good in general went together: and while produce receipts at New Orleans have been stationary for the past ten years, the enormous produce trade of Chicago has been built up in that short time. Like effects follow like causes; and when Chicago practically rejects the lower grades of produce, some other market will open to them, and that market will draw largely also of the better kinds of grain.

THE ENGLISH FARMER IN BELGIUM.

Sir,—If you will allow me, I will, in as few letters as I can, give such an account of the system of farming pursued in the best parts of Belgium—viz., the Flanders and adjacent districts—that anyone of your readers, who chooses to devote one small field, for a couple of seasons, to a trial of *Flemish crops*, may be able to do so without much trouble or expense. No new implements are required; nor is there any operation to be performed, which cannot be equally well done by our own labourers.

King George the Third instituted the Flemish farm at Windsor; but whether it was originally cultivated according to that husbandry, I know not; nor, if it was so farmed, at what time that culture was abandoned. It would be interesting to obtain this information.

During the last ten years, many improvements and new crops have been introduced into Flanders. Never was a more opportune time for their trial on English soils than the present, with a view to prove which of them may be advantageously and permanently placed in our rotations.

Wheat is now below the cost of growing it; and

turnips are diseased from, perhaps, their too frequent repetition in the usual course on light land. Would it not, therefore, be a benefit to the farmer, if some new varieties of crops, fresh to the soil, and more profitable to the grower, could be brought into our cultivation? and with the superior prosperity of the foreign farmer constantly before our eyes, surely it must be advisable, in this inquiring age, that my brother-farmers should inquire into the cause of it, and endeavour to reap the same advantages which they do.

That they are in an infinitely better condition, as regards returns for their industry, than ourselves, is indisputable. The question is, Why? They pay higher rents, according to the quality of the land, than we do, their labour is lower, but we have the advantage in machinery. The answer to the question is, They grow more valuable crops than we do, which we could, and do not grow; and they also apply these crops to manufactures in a way we are not allowed by law, but which we ought to be. We want an extension of free trade as far as the limits of equity and justice.

I wonder no gentleman has ever made trial of the

Flemish crops on his home farm. It would be a very cheap piece of patriotism, interesting and instructive to himself and neighbours, because, as I said above, there can be no question on their crops being more profitable than ours; but whether they are as adaptable to our soils and climate as *I believe them to be*, is a matter to be proved, and well worthy the very small trouble and expense of trial.

I have so arranged that for a few pence anyone can have a dozen sorts of seeds, and my pamphlet on *Flemish crops*.

A little field divided into four step lands, and each land sown with a separate *Flemish crop*, would show the whole at a glance. A piece of sandy loam, where turnips had been eaten off, would do well; twenty-four months would be sufficient to prove the winter as well as spring crops, and their admirable system of double croppings; but to carry out the latter, a deep as well as tender soil is required. To make this essay on land of a heavy or gravelly soil would not be a fair trial, nor on land poor or weedy—as in Flanders all is in the highest condition as regards manure, and as clean as possible. At the end of two seasons the field of trial could return to its usual crop in the rotation.

Their corn crops are the same as ours: the novelties to our soils would be the oil plants, the forage plants, the double croppings, and some plants which cannot be classed, but stand alone, such as tobacco on the best lands, yellow lupin in the very worst, sorgho, hybrid clover, and lastly, though the most important, the *Silesian beet-root*, which I call a *gold mine for the British farmer*, as it has been, and is now, to the cultivators both great and small, over nearly the whole continent.

I have devoted my time for the last twelve months to inquiries into the truth of the facts asserted of this crop and the manufacture of it into sugar and spirits. I will for a short time longer continue my exertions; but after that, if my brother-farmers will not look into these truths, to discover if they cannot enjoy these advantages, I must abandon my pursuit after their interests.

It does annoy me to see the smile in the faces of our foreign friends when they express their surprise to me, that we do not grow this crop, nor manufacture home-made sugar, nor spirit from roots, nor grow tobacco, nor many other of their valuable crops!

Three-fourths of all the sugar consumed by the 36 millions of the population of France, is made from home-grown beet-roots. The residue returned to the farm is nearly equal per acre to an acre of Swedish turnips as fattening food for cattle and sheep; and besides this food, every acre produces to the farmer more net profit than the gross return of an acre of good wheat in England!

When distilled into spirit more residue is produced than when made into sugar. There are various processes by which are obtained different proportions of residue, but I will take the average. A ton of roots returns half a ton of sheep or cattle food, but this half ton is equal in nutriment to the ton of raw roots. In fact, cattle cannot be fed on the raw roots till after Christmas, when some of the watery particles are evaporated. As the spring advances, the roots are of less value for sugar or spirit; and we know, as spring advances our English mangold wurzel is of more value as cattle food. Thus, the English farmer can understand how that juice which is so valuable to the manufacturer is worse than useless for cattle.

The heavy land of England by means of this crop would be on a par with turnip soils in the production of meat, and perhaps superior.

I cannot say which soil would produce the most sugar,

but no doubt the heavy land would give the largest crop of beet. The roots must not be larger than $4\frac{1}{2}$ pounds in weight. To effect this the distances between the rows must be regulated by the quality of the soil. All calculations are made on the supposition that the crop is 20 tons per acre; but I cannot help thinking that even with the above restriction as to weight for root we could far exceed this 20 tons.

All that part of the beet root growing *above ground* is very *inferior* in saccharine to that below the surface. The sort of seed has much to do with the value of the root and the success of the manufacture. Five per cent. of sugar is an average, but I know a man who last year had six and a-half, entirely owing to his superior seed.

This is quite an agricultural question. The profit would be so much greater in England to the farmer than the manufacturer, that the farmers must combine to introduce it themselves. Even abroad, a distillery is frequently started by the farmers and proprietors to obtain a *near market* for their roots, as it obvious they will not pay for distant land-carriage.

I know one distillery which works fifty tons of beet per twenty-four hours, from the end of September to the beginning of March, *i. e.*, 126 working days; if twenty tons per acre are grown as the usual crop, this distillery requires the produce of 317 acres of beet root, which, if sown once in four years, would require four farms of 300 acres each to provide them.

This shows the great extent to which it might be carried in England. The *net profit* by the sale of these roots to each of these four farms would be £675! and each would, besides, have sufficient residue paid for and on his farm to keep 160 fattening bullocks for four months; of course they having also some cake or corn.

Now, am I one of those sanguine men whose ducks are swans? I say I am not, but I only want an inquiry into these facts. These figures will, if cut in half, show the best thing for agriculture I ever knew.

It would take too much space in this letter to say more about this "*gold mine*," but in my pamphlet I have fully entered into the particulars of its cultivation, application, and best mode of introduction. All I write I can substantiate, and I think sufficient evidence has been produced to induce my brother-farmers to *think upon and inquire* into it. This is all I want of them.

There is a strange misconception and prejudice against the growth of oil seeds in England. It is thought they are injurious to the land; on the contrary, they certainly draw less from the soil than white-strawed corn crops, they are a less time in the land, and obtain very much nutriment from the atmosphere: this particularly applies to rapc seed, which consists principally of carbon and hydrogen. All those seeds which produce cake are even beneficial crops to the soil, if the cake is eaten by sheep in the same quantity of land as grow the seed which made it. The straw is useful as litter. They are a change to the ground, and are all fallow crops; in fact, it is in consequence of so many of the *Flemish crops* being planted at wide intervals that their land is so clean.

The sorgho had an unluckily dry season last year for its introduction, and was most of it sown too late; it should be put in the ground now. A friend of mine, last year, had some twenty miles from London, sown in June $8\frac{1}{2}$ feet high in November. It is making great progress in France, in proof whereof the seed has amazingly risen in price.

The yellow lupin should be sown now in the poorest sands, to plough in.

Supposing the "small field" was divided into 14 or 15 compartments, I would thus crop them; and taking

them consecutively, I will state how I would proceed in the cultivation of them.

No. 1. *The Silesian Beet for Sugar or Distillation.*—It should be drilled before the last day in April, at least 8lbs. to the acre, at 18 inches apart, and hoed out in the row to 16; but as the object is to obtain as much weight per acre as possible, and yet have no roots heavier than 4½lbs., it should be experimentally tried at 12, 14, 16, 18, and 20 inches distance from row to row. It seems extraordinary, but it is the fact, that those roots which weigh more than as above contain no more sugar than the smaller root; and also the largest proportion of saccharine is found in that part of the root which grows into the ground.

There are two sorts advised to be grown—the Silesian green-necked, and also the red-necked. Both should be sown, and from them the most down-growing roots selected for seed, which should be grown in England with great care and attention to these small but important matters.

They may be grown on all soils, which should be well cleaned, pulverized, manured, and *subsoil ploughed*. The latter is important for all descending roots.

As soon as large enough, single out, and thenceforth keep them well hoed.

In September they are ready for lifting. The neck must be cut off with the top, and the root well cleaned; they are then clamped, leaving the whole ridge of the clamp open till all evaporation has passed away.

I cannot find anyone abroad who has grown more than 20 tons per acre; but I cannot help thinking we might exceed that without too much enlarging our roots, because at 18 inches by 16 we should have 21,900 roots per acre, which at 3lbs. each would give us about 25 tons; but in all my views and calculations in this matter I have always considered 20 tons as the average crop of beet to be grown in England.

Were distilleries or sugaries established in England, as I hope they will be, these 20 tons would be worth 15s. per ton; the residue *from them* would be on an average 10 tons, which would be bought by the grower at 10s. per ton, and brought back to his farm. Thus, allowing 1s. per ton for cartage from one to two miles, the farmer would be in this position—he would have £9 per acre in his pocket, and 10 tons of cattle food, that would be equal for feeding purposes to 20 tons of the raw root.

The only extra expense in growing this compared with swedes, would be, that the seed costs more, and the roots require better cleaning; against that, I will set the advantage of having the roots well cut and macerated and at home in the farm-yard.

They are frequently transplanted after an early crop of rape, &c.; they might if required be grown after tares or a first cut of a thin plant of clover, which is unadvisable to leave for a second crop; of course such a crop of beet would only be half the weight of the other.

This crop is what I call a gold mine for the British farmers.

They can easily try it; and after having grown them, have the roots analyzed, and thus prove the quantity of saccharine that may be produced from them in England.

But they must be submitted to this as soon as taken up, as after Christmas the sugar in them gradually and weekly decreases, till in April they are no longer useful, except as food for cattle. Thus my brother-farmer will understand how the half of their weight left at the factory is no loss to him, and how the half in residue returned to the farm is equal to the whole raw root. The common wurtzel increases in its value in England as cattle food after Christmas, exactly in the same ratio as it decreases in value for sugar or spirit, consequently

here is a demonstration that what is sold for manufacturing is valueless to cattle. This is an important subject for reflection, because it seems a paradox that the extraction of saccharine should improve the feeding properties of a root; but 'tis a fact. Last week I saw some sheep feeding *on it* in sheds, at the farm of Mr. Weeks, of Bolney, in Sussex, and he declared they went on better, and were fattened in a shorter time than he ever had any on swedes.

Abroad I cannot find any one give either sheep or bullocks more than half the weight of *raw* turnips we allow them per day.

However, I have done all I can to put this fairly before my brother-farmers; *they do not respond to it*, and I can only say I am sorry I have lost my time for them; but I have the pleasant reflection I have done my best.

No. 2. *The Winter Peas* are sown directly after harvest; but to produce seed they might be now sown, and a little thinner than we do ours. It would be a great advantage if we could find a pea we might harvest a fortnight earlier than any we now have. It remains to be proved if this would enable us to do so. They should be sown at once.

No. 3.—*The Hybrid Red Clover.*—This is a distinct variety, growing as much weight as the old red.

It bears a flower, white inside and red out, exactly as if a white flower had been dipped in a red colouring, and so stained the tips of it. It is well worth sowing in clover-sick land, or on land being laid down to grass, as it lasts in the ground some years.

No. 4. *The Green-necked Carrot* should be sown immediately; 4 lbs. to the acre, in clean and deep land; the more sandy the better; the land should be well subsoiled, and if well done, 16 tons an acre may be grown. Comparing their value for horse food, with oats or hay, keeping in view their relative nutritive qualities, they would amount to a large sum per acre. They are not considered generally in this way; but it is a fair one, and every farmer who has land that will produce a tolerable crop even, should grow sufficient for the use of his horses. There are two other sorts worthy of trial by the side of the green-necked—the Vosges carrot and the Breteuil carrot: it is one of their advantages that they do not mind a dry summer.

Of all root crops perhaps, they are those which can be grown with the least manure. Deep tillage, tender soil, and permeable subsoil are of more consequence to them.

They should be hoed out to 16 or 18 inches distance, according to the quality of the land.

No. 5. *Rape.*—There are two sorts, besides the Italian ren rape. The autumn sort is the best cropper and the most commonly grown. I will here only speak of the spring rape or, or colza as it is always called abroad. It should be sown now, and hoed out as soon as it is ready, to a foot each way. In Belgium it is not sown till May, but their springs are later than ours, and as our autumns are not always so fine as theirs, in all our trials of their crops we should get in the seeds as early as we can, after we think we are safe from frosts. It requires to be kept clean. It is not a crop which I think would be preferred here to the winter rape (which I will speak of by-and-bye), but in an experimental field of Flemish crops it should not be excluded. This spring colza is cut when the pods turn yellow, but it does not come off in time to obtain turnips afterwards, which is always the case with the winter rape. We might expect the produce to be about 3 quarters per acre, which is now worth 70s. per qr. The chaff is useful to mix with the beetroot-distillery residue. It is thus used abroad, and the haulm is good for litter.

It is not considered to be at all an exhausting crop to the land.

The Royal Agricultural Society have received a paper on the yellow lupin: in my next I will give an abbreviated account of it. I am much astonished it has not been grown on the poorest soils of Norfolk and

Surrey, as in no way is the same amount of manure to be put into the land at such trifling expense.

Yours truly,

W. HARTLEY.

*Poste Restante,
Brussels, March 23, 1859.*

THE COBHAM SALE OF SHORT-HORNS.

Another great sale was added on the 23rd of March to the record of Shorthorn herds; and its £80 12s. average places it well up with every modern sale except Tortworth and Bushey. To this fifty-two cows and heifers contributed £80 4s., and eleven bulls £82 13s.; and adding about £82 for pigs, the grand total was £5,161 19s. Keen judges had laid the average at £80. They argued, and with justice, that Marmaduke and his seventeen heifer-calves would counterbalance any loss there might be on the two-year-old heifers, and the bulls, two of which have sunk sadly into the back-ground since Marmaduke came. As it turned out, this bull made the sale; and there is no doubt that twenty-four of the cows and heifers would not have fetched the prices they did, unless they had been served by him. We know not what the average might have risen to, if Mr. Combe had carried out his idea of buying the Kirklevington herd in 1850, jointly with Earl Ducie; but it seldom falls to the lot of one man to make a miss of that kind, and then run into luck as he did by determining not to leave Marmaduke at the Bushey sale.

His herd history only dates back to 1845, when he bought Fanatic, and two or three other good things, at Castle Howard. At the Kirklevington sale, which produced 4,500 gs., he merely purchased Cambridge Rose, for 70 gs., but laid out another 20 gs. on her by sending her to be served by Belleville at Mr. Mason Hopper's, a few miles off, before she came south, and The Beau was the result. He then bought Puritan, a somewhat leggy calf, from Lord Ducie; but he did not do much for the herd. Among those who were gradually enrolled as its matrons, were Fairface, of the Mannby tribe, from Mr. Hutton, of Sober Hill, near Warlaby; Gazelle, who was purchased as a calf from Mr. Parkinson's sale for 100 guineas, when Minerva, the granddam of Marmaduke, was sold for 40 guineas; Darling-ton 8th, who came from Mr. Sainsbury's at 155 guineas; and Sea Nymph, from Captain Shaw's, of Brantingham Thorpe.

The Downside farm buildings are of a substantial but unpretending kind, and look like a bevy of large old barns and sheds. The cow-house, with its neatly-plaited straw edging, its large lanterns swinging from the roof, and its handy calf-boxes is quite a specimen of the cosy style; while the long cart-stables, with the forge at one end, used to remind us, on a winter's evening, as the sparks flew up at the stroke of a red-capped Mulciber, of one of those warmly-tinted interiors in which the Dutch painters so revel. Over the park, farm, and everything there is a peculiarly pleasant English glow. The turn of the road towards the bridge—hard by the churchyard, where the old man now rests—is a beautiful rustic bit; and “Combe, Delafield, and Co.” rises to the mind with the porter at the lodge, who, true to his character, wears a snow-white apron. The two brood mares, whose scions have so often carried the “purple and white cap” at Ascot and Newmarket, roam about the park, relieved at last from all breeding toils; while Will Ford, the ancient huntsman of the Furrier bitches, looks after his brother-pensioner, The Nob, to whose Glaucus blood Mr. Combe so affectionately clung.

Every labourer has a feeling word for their late master. Sixty of them bore him by turns to that massive urn-shaped tomb; and not only they, but every other man in his employ, received a small legacy.

The day was fine and still, but rather cold; and on the whole, such a sight at a sale was never yet beheld in the south. The fame of Marmaduke and his calves had spread far and wide; and on Monday most of the great shorthorn breeders or their agents arrived in London, and not a few, including the Duke of Montrose, Viscount Strathallan, and Col. Pennant, slipped down on the quiet on Tuesday, and the Lord of Burleigh the week before. The road from the Esher station was all alive soon after nine; and when the clock had completed another round, the cabman who drove us back confessed that he and his white steed were just completing their fifth journey that day. A dead cow on its road to the Surrey Union kennels was not an encouraging omen for purchasers, as they sped along the six miles in the morning; but luncheon helped to dissipate all nervousness on that head. And well it might; for a better, both in point of quality and quantity, we have never seen at a sale. Two tables were laid in the largest half of the barn, so as to take in 240 at once; but the purveyor, Mr. Williams, the Mayor of Kingston, had not looked at the thing from a City Alderman point of view; and when the guests once flocked into the feast, the truth of Albert Smith's remark became apparent, that two Smithfield Show visitors at his Entertainment always take up the place of three ordinary ones. At all events, only forty could sit on each side; and the first batch sat so long, heedless of the thrusting masses, who were urging their stomach claims on the policeman outside, that Mr. Stafford rose, and, after impressing upon them the axiom of “Live and let live,” invited them, by his example, to retire.

As the hour of sale drew near, the crowd swelled considerably, and it was set by many at quite fifteen hundred. We have seldom seen so serried a ring; and the bevy of red Surrey waggons did yeoman service both for sight-seers and purchasers. No kings out of business attended from Claremont; and Lord Feversham alone represented the House of Peers. Among the breeders and agriculturists, we observed Messrs. Drake, Colvin, R. Booth, Bolden, Wetherell, Jonas Webb, Torr, Hobbs, Sanday, Spencer, Hales, Howard, J. Robinson, Bowly, &c.; while H. R. H. Prince Albert, the Duke of Devonshire, the Marquis of Exeter, Lord Dacre, Col. Pennant, Col. Towneley, and Mr. Marjoribanks were represented by their agents, Messrs. Tait, Drewry, Biggs, Thurnall, Doig, Culshaw, and Tallant. Mr. Stafford mounted his waggon a little before two o'clock. He remarked, in the course of his opening, on the fact that Surrey had no indigenous breed of horse, sheep, cow, pony, or pig, and, in fact, nothing but the Dorking hen; and that, therefore, such an assembly was no small tribute to the celebrity of the shorthorn. In allusion to the progress of this herd, after only a fourteen years' trial, he called on a gentleman—whose name we did not catch, but who seems to have

inflicted his pity on Mr. Harvey Combe, when Fanatic and his friends arrived, in the shape of a prophecy, that he "*would find them sweat away like a candle*"—to come forward and recant.

And so he passed on to the first lot—Fairy—and the sale opened with a 20-guinea bid. She fell, for 27 gs., to a gentleman with the ominous name of "*Butcher*;" but all forebodings after so bad a beginning were dispelled the moment the ten-year-old Cambridge Rose 6th—that rich relic of Kirklevington—stepped airily into the ring. Her forehead is very gay and beautiful, but rather too light, and her shoulders are a little upright; but still she is a very beautiful type of her race. Six of her produce were in the sale that day, and of these The Belle, The Beauty, and Moss Rose made 530 gs. Fifty was the first bid, and then Mr. Bolden came boldly out with "a hundred" from the back of the waggon. Twenty was the next bid, and they went on sharply till 160, when the competition was left to Mr. Downes, who bid for Mr. Hales, a gentleman from North Frith, near Tonbridge, and Mr. Fisher, of Australian celebrity; but when the glass ran out at 200 gs., it was announced that she was destined to leave the Old World for the New. Delight—a barren cow, and bought at Lord Ducie's sale—did not excite much attention. Lord Zetland has one or two good things out of her, but the luck of Mr. Manning, who founded a herd from his *Magnum Bonum* cow, which was thought hopeless, was cited in vain; and as the bidder of 34 gs. wouldn't declare himself, she was left to Mr. Leeney for 33 gs. Fairlight went cheap, as we thought, at 52 gs.; and Rival (a daughter of Mr. Torr's old *Rennet*, of Booth's *Anna* tribe), who was the 150 guinea plum at Mr. Marjoribanks's second sale, but now rather a speculative lot, fell to Mr. Sanday for 30 gs.; while *Graceful* (a daughter of *Gazelle*), who was bought for 100 gs., and won in Yorkshire, followed at 90 gs. The fact of her never having had a calf, although she is now nearly seven years old, brought *The Belle* nearly down to butcher's price; and even her splendid calf, *Samphire*, could not force *Seaweed* beyond 50 gs.

Darlington 5th, a grand daughter of Grand Duke, of one-thousand-guinea fame, and own sister to a heifer who was sold for 300 gs. to Mr. Thorne, of America, followed at 71 gs., and then came one of the most interesting contests of the day. It was, indeed, the very *beauty* of bidding to see Mr. Downes and Mr. Jonas Webb oppose each other for this heifer. There was a sort of calm "do or die" about the great Southdown king as he rose in his waggon, catalogue in hand, directly facing Mr. Strafford, and fired off his biddings as regularly as a minute gun. The speculators quite caught the enthusiasm, though they felt assured that the day was *Babraham's* from the first. Mr. Doig did not let Darlington 8th pass him, and 90 came in three places; but there was but a trifling competition for the deceptive *Lady Bates*, and Mr. Strafford in vain reminded his audience that her sire, Duke of *Gloster*, was bought by the Americans, at *Tortworth*, for 650 gs. A fifty bid from Lord *Faversham* sent *Saucebox* to *Duncombe Park*, and Mr. Leeney gave up his forty-one-guinea bid for *Blossom* to Mr. Kimber.

It now became the turn of Captain Spencer, who was seated on the edge of the waggon close at Mr. Strafford's right, to open his fire for the splendid *Leila*, who next showed in the ring. He carried off both her dam *Lizzy* and her calf at Mr. Grenfell's sale (the latter, only 23 hours old, for 60 gs.), and hence it was not expected that, after such a mark of preference, he would leave *Leila* under her old 200-guinea price. We never saw him bid, but it seems that he and Mr. Strafford had some secret telegraph, and when the last sand ran for 170 gs., he was declared the purchaser. *Dustie*, a stylish gay white

heifer, by *The Buck*, who was bought by Mr. Bostock for nearly 185 gs., to accompany *Master Butterfly* for the antipodes, became the Duke of *Devonshire's* for 200 gs., and we believe that his Grace has some more of the Gwynne tribe in his herd at *Holker Hall*. *Sea Nymph 2nd's* bad colour was against her, although it was pretty certain that *Marmaduke* would change it in the calf, and *Gaiety*, a nice compact little cow, went to Ireland at 150 gs. The Hon. Mr. *Duncombe* gave 53 gs. for *Dirce*, a very nice cow of a bad colour; and then Mr. *Bowly*, the author of the Royal Society's Prize Essay on the Management of Cattle, got *Flora*, after some very steady bidding, for a hundred. *Alma*, a heifer with a nice head and good hair, but also of a bad colour, fetched eighty. Her dam *Annie bred Argus*, who went to America for 150 gs.; and that keen judge of *Short-horns*, Mr. *Douglas*, two years since tried to buy her in vain. *Samphire* made a good beginning for the *Marmaduke* calves, and when a *Holderness* man saw her, he might well say that "our part of the country doesn't cut a very bad figure to-day." Mr. *Wetherell* had a general commission from Sir *Anthony de Rothschild* to select him something good, and as his choice fell here, his 120-guinea nod was the last. *Leila's* calf *Loeey* rather disappointed our expectations; and she looked as if the others had rather been master of her of late. From the hips she is not very massive, but her middle and head were remarkably nice. Mr. *Tallant* and Mr. *Downes* had a slight contest for her, but 105 gs. took her to *Bushey*. Foiled in this, Mr. *Downes* gave 110 gs. for the next lot, *Blush*, out of *Beauty*, and a beautiful specimen of the science of putting a bull of the *Duchess* and *Princess* tribe on *Bates*. There is no truth in form if she does not breed a rare bull for him some day. The racing owner of *Polestar* then carried off *Filbert* for 48 gs., and when the neat *Ayah* had gone for the same as *Blush*, *Moss Rose* came out and made the scene of the day. She is the youngest daughter of *Cambridge Rose*, and as she was calved July 2nd, she is just eligible in the heifer-calf class at *Warwick*. A hundred was the first bid, and Mr. *Bolden* said 120, but that was now capped with 150, and 200 in three places. Then came 210 in two, and when the glass stood at 250, Mr. *Tallant* was the master of the situation. There, however, his commission was exhausted, and Mr. *Downes's* 260 gs. carried the day, and proved that *Kent* was in earnest, in spite of the candle prophet. Still *Bushey* did not go away single-handed, as *Diadem*, a month-old calf, gave them another dip into their ancient *Marmaduke* for 40 gs.

By request, this celebrated bull was shifted from his place in the catalogue, and brought out first; but strange to say, the bidding for him was not very dashing. He is barely three weeks beyond four years old, and looked lively enough, as he chafed at his pole; but still no one seemed to care very greatly for having him; and the biddings, which began at a hundred, were carried on quietly between Mr. *Fisher* and Mr. *Doig* up to 350 gs., where *Australia* declined to go on. Mr. *Strafford* might well say that *Wales* "had not bought, but begged him." The *Briar*, a very smart-headed bull, went at 100 gs. to *Burleigh*, and we conclude it would only be out of courtesy that the lord of the manor did not smear the shoulder of *Marmaduke* with his paint brush, and exact a still heavier compromise for his heriot claim. Nothing among the bulls had the grand forehead of *The Beau*, but he was coarse in many other of his points. *Mainstay*, who was lame in one knee, was quite the best of the *Marmaduke* bull-calves, which descended to *Splendid*, six days old; but he has not shone as yet in bull-getting, either as regards quality or quantity, and £30 9s. was their average; whereas the seventeen heifer-calves made £77 8s. The latter were also under disadvantages, as they had lost their coats even faster than the season of

the year warranted, and did not present that wonderful richness of hair which was so observable a month since. As soon as Marmaduke and The Briar were sold, the majority of the spectators left to catch the special up-train, which was placed at their disposal at Esher; and the pigs had only a limited but a very spirited audience, who did all homage to the white blood of Master Joe, Tricksey, and The Rose, and thus a day which set the seal on short-horn breeding in Surrey came to a brilliant close.

The general arrangements and state of the stock did he highest credit to Mr. Kirbell, the bailiff; and the following were the prices realized:—

COWS AND HELFERS.

THE FIGURES REFER TO "COATES'S HERD BOOK."

Lot 1.—FAIRY, roan, calved November 25, 1848; got by Fanatic (8054), dam (Fair Face) by Maunby (7223).—Purchased by Mr. Butcher for 27 guineas.

2.—CAMBRIDGE ROSE 6TH, roan, calved Dec. 11, 1848; got by Third Duke of York (10166), dam (Cambridge Rose 5th) by 2nd Cleveland Lad (3408), g. d. (Cambridge Rose 2nd) by Belvedere (1706), gr. g. d. (Cambridge Premium Rose) by Belvedere (1706).—200 gs., Mr. Fisher.

3.—DELIGHT, white, calved March 21, 1849; got by Duke of Cornwall (5947), dam (Destiny) by Prince Ernest (4818).—33 gs., Mr. Leucey.

4.—FAIRLIGHT, red and white, calved Sept. 12, 1850; got by Liberal (10418), dam Fair Face.—52 gs., Mr. Allen.

5.—RIVAL, roan, calved May 6, 1851; got by Puritan (9523), dam (Rennet) by Fanatic (8504).—30 gs., Mr. Sanday.

6.—GRACEFUL, red and white, calved Oct. 1, 1851; got by Loyalist (10479), dam (Gazelle) by Noble (4578).—90 gs., Mr. C. Howard.

7.—SYLPH, roan, calved April 6, 1852; got by Lottery (10472), dam (Sea Nymph) by Splendid (5298).—57 gs., Mr. Gosling.

8.—THE BELLE, roan, calved May 24, 1852; got by Loyalist (10479), dam (Cambridge Rose 6th) by 3rd Duke of York (10166).—46 gs., Mr. E. Hales.

9.—SEAWEEED, roan, calved January 4, 1853; got by Lottery (10472), dam (Sea Nymph) by Splendid (5298).—50 gs., Mr. Christy.

10.—DARLINGTON 5TH, roan, calved Feb. 25, 1853; got by Fourth Duke of Oxford (11387), dam (Darlington 2nd) by Percy (9472).—71 gs., Mr. Simpson.

11.—DEWDROP, roan, calved March 20, 1853; got by Daylight (11339), dam (Diana) by Alfred (6732).—55 gs., Mr. Gosling.

12.—THE BEAUTY, roan, calved June 6, 1853; got by Puritan (9523), dam (Cambridge Rose 6th) by 3rd Duke of York (10166).—160 gs., Mr. Jonas Webb.

13.—DARLINGTON 8TH, roan, calved April 3, 1854; got by Fourth Duke of Oxford (11387), dam (Darlington 3rd) by Sir Hugh (12082).—120 gs., Hon. Col. Pennant, M.P.

14.—FROLIC, roan, calved June 4, 1854; got by Puritan (9523), dam (Fairy) by Fanatic (8054).—105 gs., Mr. Leucey.

15.—FANCY, white, calved June 20, 1854; got by The Beau (12182), dam (Fanny) by Lottery (10472).—43 gs., Mr. Garne.

16.—LADY BATES, roan, calved August 6, 1854; got by Duke of Glo'ster (11382), dam (Lady Blanche) by 4th Duke of York (10167).—73 gs., Mr. Surtees.

17.—FAVOURITE, rich roan, calved Sept. 16, 1854; got by The Beau (12182), dam (Fondling) by Planet (10616).—90 gs., Mr. Kimber.

18.—SAUCEBOX, white, calved March 25, 1855; got by The Beau (12182), dam (Seraphine) by Lottery (10472).—50 gs., Lord Feversham.

19.—RARITY, white, calved Jan. 23, 1855; got by The Beau (12182), dam (Rival) by Puritan (9523).—57 gs., Mr. Clarke.

20.—COUNTESS 5TH, red and white, calved June 16, 1855; got by Fourth Duke of Oxford (11387), dam (Countess 3rd) by Percy (9472).—40 gs., Mr. B. B. Colvin.

21.—BLOSSOM, red and white, calved August 23, 1855; got by First Fruits (12381), dam (Beauty) by Lottery (10472).—41 gs., Mr. Kimber.

22.—LEILA, red and white, calved Jan. 22, 1856; got by

Count Glo'ster (12650), dam (Lizzy) by 4th Duke of York (10167), g. d. (Louisa) by Cramer (6907), gr. g. d. (Lady Bird) by Cato (6836).—170 gs., Capt. Spencer.

23.—ASIA, red, calved April 5, 1856; got by 2nd Grand Duke (12961), dam (Apricot) by Fusileer (11499).—55 gs., Lord Dacre.

24.—GILLYFLOWER, red and white, calved April 22, 1856; got by The Beau (12182), dam (Graceful) by Loyalist (10479).—46 gs., Mr. Ellis.

25.—DUSTIE, white, calved May 10, 1856; got by The Buck (13836), dam (Daisy) by Lottery (10472), g. d. (Delight), by Duke of Cornwall (5947), gr. g. d. (Destiny) by Prince Ernest (4818).—200 gs., Duke of Devonshire.

26.—SEA NYMPH 2ND, red and white, calved June 13, 1856; got by The Beau (12182), dam (Sylph) by Lottery (10472).—48 gs., Mr. H. Hewer.

27.—GAIETY, red and white, calved July 19, 1856; got by The Beau (12182), dam (Gazelle) by Noble (4578).—150 gs., Mr. J. Richardson.

28.—DIRCE, red roan, calved December 3, 1856; got by The Buck (13836), dam (Dewdrop) by Daylight (11339).—53 gs., Hon. Col. Duncombe, M.P.

29.—FLORA, red and white, calved October 6, 1856; got by The Beau (12182), dam (Fair Light) by Liberal (10418).—100 gs., Mr. Bowly.

30.—ALMA, red and white, calved March 6, 1857; got by The Beau (12182), dam (Annie) by Broughton Hero (6811).—80 gs., Mr. King.

31.—BARBARA, roan, calved March 21, 1857; got by The Buck (13836), dam (Lady Bates) by Duke of Glo'ster (11382).—100 gs., Mr. Macintosh.

32.—Not offered.

33.—SERAPHINE 2ND, white, calved May 2, 1857; got by Fancy Boy (12859), dam (Saucebox) by The Beau (12182).—70 gs., Mr. Noakes.

34.—FOLLY, white, calved May 26, 1857; got by Fancy Boy (12859), dam (Fancy) by The Beau (12182).—60 gs., Mr. Clarke.

35.—DAIRY, roan, calved Dec. 19, 1857; got by Fancy Boy (12859), dam (Dewdrop) by Daylight (11339).—50 gs., Lord Feversham.

36.—FENNEL, roan, calved February 11, 1858; got by The Beau (12182), dam (Fair Light) by Liberal (10418).—47 gs., Mr. Hardwick.

37.—SAUCY, roan, calved March 19, 1858; got by Marmaduke (14897), dam (Saucebox) by The Beau (12182).—70 gs., Marquis of Exeter.

38.—SAPHIRE, roan, calved March 10, 1858; got by Marmaduke (14897), dam (Seaweed) by Lottery (10472).—120 gs., Sir Anthony de Rothschild, Bart.

39.—LOOBY, roan, calved May 1, 1858; got by Marmaduke (14897), dam (Leila) by Count Glo'ster (12650).—105 gs., Mr. S. Majoribanks.

40.—BLISS, red roan, calved May 29, 1858; got by Marmaduke (14897), dam (The Beauty) by Puritan (9523).—110 gs., Mr. Hales.

41.—GRACIOUS, red and white, calved May 3, 1858; got by Marmaduke (14897), dam (Graceful) by Loyalist (10479).—80 gs., Hon. Col. Pennant, M.P.

42.—FIBBERT, red and white, calved June 12, 1858; got by Marmaduke (14897), dam (Favourite) by The Beau (12182).—48 gs., Mr. Siewing.

43.—AYAH, roan, calved June 29, 1858; got by Marmaduke (14897), dam (Asia) by 2nd Grand Duke (12961).—110 gs., Mr. Crawley.

44.—MOSS ROSE, roan, calved July 2, 1858; got by Marmaduke (14897), dam (Cambridge Rose 6th) by 3rd Duke of York (10166).—260 gs., Mr. Hales.

45.—DUCHESS, rich roan, calved July 21, 1858; got by Marmaduke (14897), dam (Darlington 8th) by 4th Duke of Oxford (11387).—82 gs., Marquis of Exeter.

46.—FRAILTY, red and white, calved September 6, 1858; got by Marmaduke (14897), dam (Fuchsia) by The Beau (12182).—37 gs., Mr. Hardwick.

47.—ROSA, white, calved September 22, 1858; got by Marmaduke (14897), dam (Reality) by The Beau (12182).—36 gs., Mr. Wells.

48.—SEA NYMPH 3RD, red and white, calved October 19, 1858; got by Marmaduke (14897), dam (Sea Nymph 2nd) by The Beau (12182).—36 gs., Mr. Morris.

49.—FAIRMAID, white, calved October 25, 1858; got by

Marmaduke (14897), dam (Festive) by The Buck (13336).—33 gs., Marquia of Exeter.

50.—DIANA, roan, calved January 3, 1859; got by Marmaduke (14897), dam (Dewdrop) by Daylight (11339).—30 gs., Mr. Morris.

51.—DIDO, white, calved January 3, 1859; got by Marmaduke (14897), dam (Dewdrop) by Daylight (11339).—20 gs., Lord Suffield.

52.—Not offered.

53.—SPICEY, roan, calved March 6, 1859; got by Marmaduke, dam Saucebox.—31 gs., Mr. Simpson.

54.—DIADEM, roan, calved Feb. 26, 1859; got by Marmaduke, dam Darlington 5th.—40 gs., Mr. S. Marjoribanks.

B U L L S .

Lot 1.—THE BEAU (12182), roan, calved May 5, 1851; got by Belleville (6778), dam (Cambridge Rose 6th) by 3rd Duke of York (10166).—75 gs., Mr. Walesby.

2.—FANCY BOY (12859), roan, calved September 1, 1854; got by The Beau (12182), dam (Fairlight) by Liberal (10418).—44 gs., Mr. Calca.

3.—MARMADUKE (14897), roan, calved March 7, 1855; got by Duke of Glo'ster (11382), dam (Minerva 2nd) by St. Martin (8325).—350 gs., Hon. Col. Pennant, M.P.

4.—THE BRIAR (15376), roan, calved June 7, 1856; got by Puritan (9523), dam (Cambridge Rose 6th) by 3rd Duke of York (10166).—100 gs., Marquis of Exeter.

5.—RAMBLER, roan, calved May 14, 1857; got by Fancy Boy (12859), dam (Rarity) by The Beau (12182).—60 gs., Mr. Sleath.

6.—FOR, roan, calved October 14, 1857; got by Argus (14103), dam (Fuchsia) by The Beau (12182).—48 gs., Mr. Lowndes.

7.—FALSTAFF, rich roan, calved January 5, 1858; got by The Beau (12182), dam (Fairy) by Fanatic (8054).—66 gs., Mr. Harbidge.

8.—MAINSTAY, roan, calved March 17, 1858; got by Marmaduke (14897), dam (Frolic) by Puritan (9523).—33 gs., Mr. Macintosh.

9.—BEPEO, red roan, calved November 6, 1858; got by Marmaduke (14897), dam (Blossom) by First Fruits (12881).—33 gs., Mr. Ellis.

10.—Not offered.

11.—FANCY MAN, roan, calved Feb. 12, 1859; got by Fancy Boy (12859), dam (Lady Bates) by Duke of Glo'ster (11382).—36 gs., Mr. Lambe.

12.—SPLENDID, red and white, calved March 17, 1859; got by Marmaduke, dam Sylph.—21 gs., Mr. Carrington.

CAUSE OF DEATH FROM "OLD AGE."

Until it has been proved to the contrary, the mass of mankind consider it impossible to alter existing circumstances; yet had this idea of impossibility been allowed to retain undisturbed possession of the public mind, no advances could have taken place in the comforts, or addition to the conveniences of life.

But the advance of science is irresistible, and can neither be prevented by the clamours of the superstitious, nor by the dicta of those whose interests are identified with the stultification of its growth to the small capacity of their own minds.

We already separate the refuse and incombustible ashes from coals; and shall we not also separate the *excess* of earthy matter—the elements of death—from our food, and retain for our use the life-sustaining principles? It by no means follows that because elements are generally, or even always, naturally combined, that they are inseparable, or that we must take the bad with the good.

Apart from accidents, temporary illness, &c., which do not belong to this subject, one cause, and one cause only, gives rise to the chief difference between old and young persons; that is, the undue accumulation of earthy matter in every portion of the body; and this is not, as frequently supposed, a morbid action commencing only in advanced life, but it begins with the earliest period of existence, and continues uninterruptedly through every succeeding stage; though it is only when the limbs begin to grow stiff, the flesh to shrink, the pulse to become feeble, and the eyes dim, that "old age" is said to be approaching. The decrepitude is not however produced by the lapse of years, but by the deposit of earthy matter which takes place (exactly as ashes accumulate in a fire-grate, or lime in a kettle, &c.); and this not alone in the bones, but after they become "set," in every portion of the whole system: thus obstructing the larger, and completely blocking up the smaller passages which ought to convey nutriment to every part of the body, and eventually rendering parts rigid, which it is essential for the continuance of life should retain their elasticity.

The excess of lime is derived from the food and drink taken into the body; for it is certain that no element can

be produced by the body. As we renew the body by food, we, in fact, rebuild ourselves; and the materials we use, generally contain too great a quantity of lime. That the body has not the power to throw out the excess beyond its absolute requirements is only too evident, from its gradual accumulation eventually destroying life.

In a newspaper column it would be out of place to enter into a detailed statement of the proportion of lime in various foods, though it may be stated that as a rule *grain contains more lime than any other food in extensive use*. And here it is desirable to point out a serious error which, from the publicity it has attained, and being promulgated by an authority to whom we are on many accounts much indebted, is the more likely to cause serious injury. Notwithstanding that grain foods contain so large a proportion of lime, Liebig states that, "It may be regarded as a physiological truth, established by experiment, that corn-flour is not a perfectly alimentary substance; administered alone it does not suffice for sustaining life. From all that we know, this insufficiency is owing to the want of lime—so necessary for the formation of the osseous system;" and proceeds to state the benefit which would arise from the use of lime-water in making bread! What proof is there of a *deficiency* of lime in bread to sustain the osseous system? On the contrary we see millions of beings bearing, almost without exception, gradually increasing evidence of the *excess* of lime; and if lime be *deficient* in the grain foods, which contain a greater proportion than any other food in general and extensive use, where, in the name of common sense, does the *excess* of lime in the body come from?

As it is not probable that persons will be induced to avoid ordinary articles of food, it is satisfactory to know that a discovery has been made by which the excess of lime can be rendered soluble by mild chemical preparations, which may be taken along with the ordinary food, and which have been proved by extensive experience to be also highly beneficial to animal economy; and the excess of lime being in this soluble state removed from the system, the person or animal becomes again elastic, and the passages being free, nutriment is again conveyed by the fluids to

every portion of the body; thus restoring its original plumpness and activity.

Argument, however, seldom convinces, and is not the purpose of this communication; therefore, in order to prove the truth of the above, I make the following offer, subject to the annexed conditions (which are intended to prevent my being expected to practise upon some worthless animal in the hands of mercenary parties); but which I should be willing to modify to any extent not likely to interfere with the decisive character of the proof:—

OFFER.

In order to demonstrate the practicability of removing both the cause of what is frequently termed "old age," and its effects, I hereby engage to supply to any one gentleman, *free of all charge*, and subject only to the following conditions, a preparation which shall completely restore to vigorous and active condition any superannuated horse, and that this restoration shall not be a mere temporary stimulus, but actually render the horse again serviceable.

1. That the horse be *not less* than twenty-five years of

age, and have been the winner of a cup at any of the first class races in England, or if a hunter or carriage-horse, have at some period of his career changed hands for not less than 200 guineas.

2. That it be certified that at the present time the horse is free from acute disease, dislocations, or other affections, save and except only the ossification, or stiffness of "old age," and its consequent disability to work; the certificate to be accompanied by a general statement of the present capabilities of the horse.

3. That the owner undertakes to cause the preparation to be regularly given to the horse as directed (in food), during the whole course of the experiment.

4. That the horse (being already superannuated) shall remain, during the treatment, free from labour, and be fed upon suitable ordinary food.

5. That at the termination of the treatment, the owner of the horse furnish me with another certificate, and report of the then state and capabilities of the horse.

G. H. BOLTON, (Agricultural Chemist.)

Warrington, 14th March, 1859.

THE CATTLE OF ENGLAND AND FRANCE.

[TRANSLATED FROM THE FRENCH OF THE "JOURNAL OF PRACTICAL AGRICULTURE."]

To M. le Baron de Clazeau de Cleraut.

MONSIEUR,—In the *Journal of Practical Agriculture* of the 20th November last, page 408, I read a letter signed by you, entitled "On the Ovine and Porcine Breeds at the Regional Meeting of the Niort." This letter replies to the complaints of M. le Marquis de Dampierre. If I take the liberty of interfering in a debate raised between two men so respectable, from their spirit, their tone of progress, and devotion to agriculture, it is certainly not for the purpose of taking part or cause of one or the other. My only object is to point out some errors you have committed, inadvertently without doubt, and which in my humble judgment may create a prejudice to be regretted in the progress of agriculture of our common country. The condition of French agriculture is too critical to allow those devoted to it to stand neuter, and refrain from defending it against even its friends. I therefore, hope Sir, that you will not see in this letter a personal attack upon yourself, whom I have not the honour of knowing, but only a conscientious protest against some hazarded assertions, and the conclusions you draw from them, in order to support your arguments in an article so much the more dangerous that it is written with great refinement of style and spirit.

You say, "But ought not the jury to take into consideration the different conditions of agriculture and breeding in the two countries? Does it not know at what an expense of infinite care, solicitude, and of rich and abundant food, England produces those races, the importation of which they recommend to us?" &c., &c. Then comes a bucolic description of fine and luxuriant pastures, in which the happy flocks of sheep strut softly about, or extend themselves upon the verdant turf, and see, without disturbance, abundance everywhere around them, &c., &c. Then again comes a description of those troughs filled with cut hay and straw, cooked by steam, and interlarded with lindseed cake reduced to powder, which await them at the fold when they return thither at night, &c., &c.

I know not, sir, whether you have visited England as a

simple tourist, or as an agriculturist. All I can say is, that your description is too poetical. The attention given to the sheep in England, is far from deserving your exaggerated praises. During twenty years that I have travelled over England, in every respect as an agriculturist, in no part have I seen the meadows as you say, withdrawn from the scythe. In the counties where the breeding of sheep is most general, there are few or no meadows; and I can assure you, that with the exception of Lincolnshire, Leicestershire, Lancashire, and some of the central districts of England, where agricultural industry consists only in the fattening of cattle on pasturage, as in the valley of Auge in Normandy, the sheep feed only on artificial grasses, and are penned on the open earth. Besides, the South-downs and Hampshire-downs live commonly in the most frugal manner upon the downs of the counties of which they are the natives; and certainly those sandy downs are far from presenting that aspect of rich meadows of which you speak. Again, I would thank you to tell me, where in England you have seen the sheep go for the night to feed out of troughs filled with provender? It is a spectacle I have never yet witnessed. At all events you ought not to cast blame upon the English for taking good care of their animals, since you recommend it yourself; nor must you suppose that the English farmers make the rearing of them a costly luxury from which they derive no profit. But I see what you are aiming at. You do not wish the French agriculturists to import those magnificent breeds, "Because," say you, "the habits of French agriculture are bad; there are only moors there in the place of the English meadows," &c. But, Sir, before applying themselves to the culture of roots and artificial grasses, the English began by improving their breeds of animals. An agricultural progress, in order to be founded on logical and solid bases, should begin by the improvement of breeds; that being the multiplication and increase of the power of making dung. How would you wish our farmers to abandon their fallows and produce roots? For that, manure is

wanted; and they have none. Then, what would they do with their roots and artificial grasses when they have hardly any cattle? and the few they do possess, and which are only sufficient for their labour, are so backward, and so difficult to fatten, that if it were not for the labour to which they are applied, and the poor and gratuitous pasture where they allow them to wander, they would become a source of ruin to the owners. You know, undoubtedly, that on an equal extent the English rear, feed, and bring to maturity, three generations of animals to our one. In number this is twice as many as with us. There is, therefore, a produce of meat, wool, fat, and dung, six-fold of ours; and to nourish this multitude of animals they have been compelled to cease to stubble the land. Wheat occupies only a fifth part of the cultivated land, and the quantity and quality of it are increased in so remarkable a manner, that this year (1858) the little England, properly so called, that is to say including Wales and Scotland, has produced something like forty-two millions of hectolitres of wheat. This gives an average of nearly 50 hectolitres per hectare.* Certainly in presence of such results, it appears to me to be quite allowable for those who are convinced that this immense agricultural wealth is the direct and natural effect of the improvement of the breeds of animals, to promote with all their influence the adoption of the same means, in order to raise up with us the same elements of prosperity.

Certainly it is excellent advice to give to our cultivators, that of feeding their animals better; but you must first furnish them with the means of following it. With their indigenous races those means cannot exist. These races suffice for the labour with some, and for milk with others; but beyond these two conditions they are too burthensome either as dung producers or as beasts for the slaughterhouse. The proof of it is in the necessity for what M. Jamet calls the specialization of the races. In one place they raise them for labour, in another for milk, in a third fatten them. The English farmer has no need for this expedient, created by the poverty of our agriculture and the defects of our breeds. He unites in his operations all the conditions that we are obliged to disperse over our provinces, and thus to concentrate all the advantages which with us are divided.

With you, sir, I pass to the porcine race. What you say of the breed known in France under the name of the New Leicester (I have never known why), appears to me contrary to the experience of all the breeders. Allow me to ask you, amongst what breeders, at the shops of what butchers, at the table of what Amphitryons you have seen that "the flesh of the New Leicesters was overloaded with flabby and tasteless fat," &c., &c.? Who, then, has told you that in England the New Leicesters are considered as yielding more fat than meat; and that the English agriculturists, those skilful innovators and calculators, reject them, and prefer, for the production of meat, other and more rustic races? I maintain that among all the breeds, it is the small white breed, known in France under the name of the New Leicester, that is the most esteemed in England; it is the one that realizes the highest price in the market, even when there are only Englishmen for purchasers. It is that which carries off the prizes as a race for the butchery at Smithfield, and for breeding at the cattle

shows. It is that which is seen in numbers infinitely greater at Newgate and Leadenhall markets. As to the reproach of producing more fat than meat, it is not very serious; for, after all, the fat does not come from the animal, but from the food given to it. For myself, who breed New Leicesters, and both sell them to the butchers and use them upon my table, I formally oppose my assertion, supported by a long experience as a breeder and agriculturist, to yours. I do not know a race of pigs producing more meat of the best quality from a given quantity of food, and consequently yielding so much profit to the breeders and the consumers.

You say that our indigenous porcine breeds are much superior to those of England, and are so much prized by the English, that M. Mosselman has established a line of steam-boats, under his command, expressly to export for the English markets considerable quantities of French pigs, whose firm and excellent meat was particularly esteemed by the butchers. "They die well," say the butchers; and they add, "all the foreign cattle do the same." M. Mosselman, of whom I have the honour to be the friend, and whose export trade with England I am well acquainted with, has never established a line of steam-boats in order to take pigs to England. He is not the commander of a ship. He owns one small boat called the Argyle, which makes voyages between Carentan and Southampton, laden with butter, eggs, fruit, and occasionally a few fat cattle for the Southampton market, when the fluctuations of price admit of it. It is possible that he may sometimes have attempted the exportation of pigs, which were sold in England, for all kinds of butchers' meat are welcome on the English market; but certainly the speculation has not succeeded, for it has not been continued. But what shall we think of that other assertion, that all foreign cattle are in favour on the English markets? We have only to throw our eyes over the averages of the markets, and we shall see what enormous difference exists between the price of foreign cattle and those of the country. Will you think, after that, sir, that your conclusions, and those of the commission over which you preside, are in agreement with those of the English cultivators, and that you have ranged yourselves under the banner of their good sense and experience?

Not even the Durhams can escape your kicks. You say, "Ask the Scotch if they are disposed to sacrifice to the Durham crosses this admirable little breed of black bullocks, whose fine and savoury meat obtains in Smithfield market 20 centimes per kilogramme more than the finest Durham beef." In the first place, there is no country in the world in which the Durham breed is more appreciated than in Scotland. The Scotch cross their native breeds with Durham bulls, in order to give to the product more precocity and greater aptitude for grazing. As to the higher price that the "Scots" realize upon the markets, that difference is caused only by the smaller quantity of waste they contain. The Durham oxen are killed young, and that is what makes the profit of the producer; but it is not that of the butcher, who finds a less advantage from it than from animals more aged, and, consequently, yielding more tallow. Bring to market a Durham ox of five or six years old, well fattened, and you will see if he will not realize a price quite as high as the best Scotch bullocks. I will add, lastly, that the greatest difference that can be pointed out between the price of the Durham and the Scotch oxen is two pence (or 20 cents) per stone of 8lbs. This difference is only one-fourth of that which you describe.

I shall not push this discussion further, and therefore con-

* There must be some error here. The hectolitre contains 2½ bushels, and a fraction over; the hectare, 2A. 1R. 35 P. If we reckon it in round numbers at 2½ A. the result will stand thus:—Hectolitres 50 multiplied by 2½ equal 125 bushels, which divided by 2½ are equivalent to 50 bushels per acre. This is nearly double the average usually allowed for the wheat crop in England.—TRANSLATION.

clude by saying, that the agriculture of our country will never find an element of riches or prosperity in the quality of the meat of its breeds of animals by concluding that *that* quality is superior to that of the English breeds, and remind you that it is the contrary that I maintain, but rather in the quantity. The mass of consumers have not delicacy of palate enough to distinguish an imperceptible shade in the taste of meat. The population who consumes, as well as the farmer who produces, require a great quantity of meat, in order, not only to supply the demand of our markets, but still more, to furnish to our neighbours the deficiency in their production. That is the question; to place it upon shades of taste or flavour, which are appreciable only with gourmands, is a mockery. The agriculturists, setting aside all prejudice of race and nationality, ought to apply themselves to the breeding of animals that bring the most profit; although even MM. the gourmands who hold to flavour without being willing to pay an extra price for it, may make wry faces and cry "shame" upon the English.

F. R. DE LA TREIGNAIS.

P.S. Allow me to transcribe here the following passage, taken from the last publication of one of our most eminent economists. In a book entitled "*Agriculture and Population*," M.

Léoncé de Lavergne says, in speaking of cattle, p. 203, "Agriculture has three great products—meat, cereals, and wool. Of these three commodities, meat is the most important, if not in itself, at least by the influence that its production exercises over the others. Not only does it constitute one of the most precious aliments for man—one of those which combine in the smallest volume the most of nutritive matter, and which repair the most the forces without fatiguing the organs; not only it implies the labour, the milk, and the wool, which possess, not less than itself, of beneficial value; but without it, no dung, and consequently but few cereals. All the agricultural edifice rests upon the cattle; there is no greater interest for peoples. We may say without exaggeration that the richest and most powerful are those who have the most of them. This production has made great progress in France, having doubled in fifty years, and quadrupled in a century. Is that enough? Beyond a doubt, no; for, in the present state of agricultural knowledge, we might still make it four times more. England has done so; and I therefore understand that they attach an importance of the first order to that species of product. All that interferes with the propagation of cattle is a *public misfortune*; all that promotes it is a blessing, &c."

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

WEEKLY COUNCIL, March 30.—Present: Colonel Challoner, Trustee, in the Chair, Sir E. C. Kerrison, Bart., M.P., the Rev. L. Vernon Harcourt, and Mr. T. Lyon Thurlow.

MANGEL WURZEL.—Mr. Edward Farmer called the attention of the Council to the importance of storing Mangel Wurzel, and to a fact which had occurred within his own experience, which led him to believe that the root in question "might be kept good for food in the winter, twelve months after having been stored from the ground."

POLISH AGRICULTURE.—The Agricultural Society of the Kingdom of Poland having decided to hold an annual agricultural meeting, at which a leading feature should be the trial of implements, applied to the Council for a statement of the principles on which the trials of the Royal Agricultural Society of England had been carried on. The Council ordered copies of the several reports on the trial of implements at the Society's country meetings, along with Prize Sheets for the current year, and a statement of the prospective arrangement for the trials during the ensuing four years, with an explanatory letter from the Secretary, to be forwarded to the Agricultural Society of Poland.

Adjourned to April 6.

MONTHLY COUNCIL, April 6.—Present: His Grace the Duke of Marlborough, President, in the chair; Earl Powis, Lord Feversham, Lord Leigh, Lord Berners, Sir Charles Morgan, Bart., Sir J. V. B. Johnstone, Bart., M.P., the Hon. W. G. Cavendish, M.P., Colonel the Hon. A. N. Hood, Mr. Alcock, M.P., Mr. Amos, Mr. Raymond Barker, Mr. Barnett, Mr. Barthropp, Mr. Bramstone, M.P., Mr. Blount, Mr. Caldwell, Colonel Challoner, Mr. Exall, Mr. Foley,

M.P., Mr. Braudreth Gibbs, Mr. Hamond, Mr. Fisher Hobbs, Mr. Hudson (of Castlereagh), Mr. Lawrence, Mr. Milward, Professor Simonds, Mr. Slaney, M.P., Mr. R. Smith, Mr. Banks Stanhope, M.P., Mr. Thompson, Professor Voelcker, Mr. Jonas Webb, and Mr. Wilson (of Stowlangtoft).

The following were elected members:

Bruce, John, Tiddington, Stratford-on-Avon
Burnet, David, Ashley, Stockbridge, Haunts
Cazalet, Rev. W. W., 6, Grosvenor-Street
Elliston, B., Croydon, Arrington, Cambridge
Graves, Septimus Perry, Stoney Thorpe, Southam
Green, William, Takely, Little Canfield, Chelmsford
Halford, Thomas, Newbold-on-Stour, Stratford-on-Avon.
Hloelay, Thomas, The Fosse, Leamington
Isherwood, Arthur, Marple Hall, Steckport
Langdon, William, Ashford House, Barnstaple
Long, Alexander Wearing, Mint Cottage, Kendal
Margetts, John, High-Street, Warwick
Morgan, Godfrey Clsrle, M.P., Ruperra Castle, Cardiff
Noakes, John Tompsett, Brockley House, Lewisham
Neville, the Hon. Chas. Cornwallis, Heydon House, Royston
Nightingale, Vaughan, Burway, Ludlow
Perkins, John S., Leek Wootton, Warwick
Salt, Thomas, Weeping Cross, Stafford
Sanderson, Hastings, 5, Brinswood East, Leamington
Surtees, Henry Edward, Dane End, Ware
Wilson, William, Berkhamstead
Wright, William, Siggleshorpe, Hull.

FINANCES.—Mr. Raymond Barker, Chairman of the Finance Committee, laid before the Council the Monthly Report on the accounts of the Society, from which it appeared that the current cash-balance in the hands of the bankers was £2,206.

JOURNAL.—Mr. Thompson, Chairman of the Journal Committee, made the following report:

1. The Committee recommend that the spare copies of the Supplement report should be sold at 2s. 6d. each.
2. That the paper on Potatoes by Dr. Lsgg, ordered to be reprinted, should be reduced so as to be published at a very cheap rate for the use of cottagers.

3. The result of the reprint of the article on Horse-shoeing is as follows:

	£	s.	d.
Printed 5,000 copies (cost)	37	10	0
Sold 3,300 „	43	16	10
On hand 1,700 „	Profit	6	6
		10	

WARWICK.—Lord Berners, Chairman of the General Warwick Committee, reported to the Council the satisfactory progress made in the preparations for the Society's ensuing country meeting, to be held at Warwick in the week commencing Monday the 11th of July.

DINNER.—Mr. Fisher Hobbs brought forward the motion of which he had given notice at the last monthly meeting, to rescind the resolution of the 5th of May last year, in reference to the conditions under which a dinner should take place in future at the country meetings of the Society, in order that he might be enabled to submit to the Council a plan by which the dinner, in his opinion, might be arranged without the interference of former difficulties. A very full discussion then ensued on this subject, in which the whole bearings of the question, founded on past experience, were reviewed; and Mr. Fisher Hobbs having replied to the various points of objection to his motion, the Council divided, when it was found that the Council by a large majority adhered to their resolution of last year, on which the local committee at Warwick had already recommended that there should be no dinner at the Warwick Meeting, and which stands as follows:

“That in future, if any dinner be held at the country

meetings under the patronage of the Society, the entire management shall be vested in the local committee: but the Council shall have the option and power of reserving and taking such a number of tickets as it shall think fit; and this Society shall nominate the chairman, and supply the list of toasts, but shall have no other liability connected with it.”

COUNTRY MEETING OF 1860. — Memorials were received from Canterbury, Croydon, Guildford, and Reigate on the subject of the country meeting to be held next year in a district comprising Kent and Surrey. An Inspection Committee was appointed, consisting of Mr. Raymond Barker, Mr. Brandreth Gibbs, the Hon. W. G. Cavendish, M.P., Mr. Fisher Hobbs, and Mr. Milward, with a request that they would visit the proposed sites, and report on their suitability or otherwise for the purposes of the Society, by the next Monthly Council. M. de Tréhonnais presented a copy of his new serial work published in France, on the results and progress of agricultural improvement in England.

The Council adjourned to the 13th of April.

WEEKLY COUNCIL: Wednesday, April 13.—Mr. Raymond Barker, Vice-President, in the chair.

The names of nine candidates for election were read. Also a communication from Miss Banister on the *Festuca fluitans*, of the present state of growth of which she transmitted a specimen.

The Council then adjourned over Passion and Easter week to the Monthly Council on the 4th May.

USEFUL SUGGESTIONS UPON THE GROWTH OF SEEDS.

Nothing affords me greater pleasure than to be the means of usefulness to my brother-farmers. I hold it to be my peculiar province to keep a watchful eye upon passing events connected with the pursuits and business of practical agriculture. My attention has been more particularly drawn, during the past week, to a very interesting trial which took place at Lincoln during the late assize, *i. e.*, *Henley v. Woodcock*. Henley sues Woodcock for the damages which were sustained by some thirty or forty farmers in having purchased of him what they alleged to be defective mangold wurzel-seed the growth and stock of the said Woodcock, of whom he purchased it under warranty as sound and good seed. These farmers (of which some 34 were brought forward) complained that owing to this bad seed they had very indifferent crops, and in some instances nearly a failure; that they claimed compensation of Henley, who, to save himself, makes the like claim upon Woodcock, who refuses the claim, hence the action at law. The case came before Lord Campbell and an intelligent jury of practical men, who after a patient investigation, occupying the whole day, gave a verdict for the defendant.

Now, it appears that the seed did possess germinating powers, but in a weakly state, owing most probably to some difficulty in getting it properly harvested, or some irregularity in the ripening, or to taking harm in the

stock, or the thousand-and-one occurrences which often prevent a successful ingathering of the crop and its safe preservation. I know not who was to blame in this matter: seedsmen generally prove their seeds before sending them out; but they have a simple, ready, and almost certain way of doing it, and they attend to this germinating process so carefully, that a far greater proportion of tender seeds would grow under their management, than in a common field, under the best culture and finest mould; hence they will warrant their seeds, and will prove their growth too. How then is a farmer to obtain redress or compensation for a lost crop owing to the circumstance of sowing a defective seed—defective perhaps from various causes, as named above, but which he cannot generally detect from casual examination of the seed in the sample? The general inquiry in making a purchase is with the view to ascertain the precise stock, and if it is good growing seed; being satisfied on this point, and very often from actual observation of sample stocks in process of germination, he takes his seed and sows it; some dry hot sunny days succeed, the soil possibly a little chequy, when if the seed be weak or partially defective from over-heating or otherwise, he is almost certain to lose his crop; but if he tries their germinating powers in a carefully-prepared way, he will find a fair average number grow. It is thus that he is

prevented from making a clear and satisfactory claim upon his seedsmen, and which the jury at Lincoln have fully confirmed.

The suggestions I desire to give are very simple. The first is, that every farmer should be prudent enough to purchase his seed early, and prove them before sowing. Second, that he should thoroughly prepare his soil, and then wait a reasonable time, if necessary, for a suitable season for sowing them. Third, that he shall never sow them without some mild stimulating manure to ensure their rapid growth after germination. Fourth, that he shall commence hoeing as soon as practicable, and as frequently stir the soil by horse-hoe or otherwise, as his judgment dictates: the oftener the better. The usual mode of testing the growth of seeds is by taking a certain number, and lay them between layers of coarse flannel; then water them freely with rain-water at a mild temperature, drain off all superfluous water, and lay the flannels in a convenient place, having a temperature of about from 60 to 65 degs. Fahrenheit, taking care to keep the flannels at an equal moisture throughout, but not too wet; and in about forty-eight hours signs of life in vigorous seeds will appear. The proportion of germinating seeds must be noted, which thus proves the experiment. Another course is to plant a given number of seeds in a flower-pot, and place them in a hot-bed, or in a forcing-house or frame. This is favourable to weak seeds, and does not well prove the quality and strength. A better plan is to sow a few rows in the garden or other convenient spot, and mark the state of the land and the result. Many such schemes are devised; at all events, if farmers would but give themselves this little trouble, it would save them from many vexatious disappoint-

ments, and generally secure a safe and profitable crop.

The season for sowing clover and grass seeds is at hand. I would by all means urge every grower to make an early purchase, and try them as above. These seeds are very often heated in stock, and lose their vitality. Clovers are almost universally mixed: the general merchants, buying many samples, put them together; those of a like quality are placed in one bulk, and *vice versa*, from whence they are retailed to their various customers, called seedsmen. These again sell to the farmers; and as they seldom lay in large heavy stocks, they are often in difficulty to *match*, and towards the close of the season many inferior parcels are sold, and every endeavour is made to clear out the old stocks; hence everything goes up. It is a great folly to sow inferior seed of any kind, and more particularly any of those seeds which have to make their way under a most promising plant of barley or other corn. The vigorous plant here is sure to live; but the weakly, sickly, almost lifeless emanation of a defective seed is as sure to die. Be sure to deal with a trustworthy and substantial seedsmen. You may be guided in a great measure by such a man; still it would be wise to try all for yourself; it would guide you as to the quantity you would require per acre. I have had capital crops of clover from eight or nine pounds of good seed, and I have seen very inferior crops from double that quantity. From twelve to fourteen pounds of good seed per acre is sufficient on all good clover land, and in a good state for its growth. Only be commonly prudent and cautious in these matters, and much good will result. Think of a lost mangold crop, a lost turnip crop, a lost clover plant, a lost seed crop! You cannot estimate the precise damage.

THE ADVANCE OF AGRICULTURE IN IRELAND.

A General Election interferes terribly with business. City people shake their heads, and prepare to wait with due resignation until it is over. In the country, however, they more zealously keep up the excitement of the thing, and, despite railways and telegrams, are continually riding in hot haste in and out of head-quarters. The local prints abound with meetings and addresses, in which the nice art is evinced of saying as much and meaning as little as possible. But we are not to be caught in this way. We can only shake our heads and wait until it is over. Notwithstanding that day after day we see, here, there, and everywhere, country gentlemen stirring up rural audiences, we feel with the used-up exquisite, "there is nothing in it." Green and Blue, Derbyite and Russellite, must settle their differences ere we can hope for anything very useful or practical—in a word for much in our way. All the world, for a week or two, is electioneering; and the farmer, like the rest of his neighbours, has not much time to mind his own business.

At such a period, then, any exception to this rule stands out in a very strong light. It must redound

more than ever to the credit of those who can even now talk calmly and ably of what really concerns them—beyond the designs of Mr. D'Israeli or the prospects of Mr. Bright. Stranger still is it that to the sister-kingdom we must turn for any such illustration as that we would seek. The Dublin Society has just held its usual spring cattle and implement Show. Our own report will tell how the character of this meeting has been more than usually high. We shall leave this to speak for itself, and dwell here rather on the evening gathering, at which the premiums were distributed. It must be understood, that any gentlemen who take part in these proceedings are expected to have something to say, and the occasion has often, ere now, been distinguished by some very excellent addresses. But the English reader will be pleased to picture to himself a body of Irishmen assembled together on the eve of an election, with a row of industrious reporters before them—we will not even have his Excellency the Lord Lieutenant present to keep them in order—and we can readily imagine the exciting topics they would turn to. The safer plan, after all, will be to let our imagination run no such

riot, but to read as attentively as it deserves what was said on the award of the prizes at the Royal Dublin Society's Show.

There was, we are told, a crowded attendance, and as is usually the case in the sister kingdom, many amongst the gentlemen called up quite equal to addressing a public body. But we find nothing of a fatal fluency. It is remarkable, on the other hand, how well every speaker kept himself to the subject-matter of the evening's meeting, and how carefully each one avoided anything like a mere party cry, however popular he might have known it to be. The Englishman who returned thanks on behalf of the judges, did not speak more practically or seriously to what agriculture had done than did those who preceded or followed him. It is, indeed, an encouraging and memorable sign to see the Irish themselves dwelling with honest pride on such a pursuit, and gladly testifying to what it had done for their country. The Lord Chancellor must have known the people far better than many of their professed friends, when, just that time since, all he asked was that they should be left to themselves for ten years. More or less, they have been. It has unquestionably been a period remarkable for the little public agitation carried on, and with this result, that "never was Ireland in a more prosperous and healthy state than at this moment."

The general development of the agriculture of the sister-kingdom is almost altogether attributable to the influence of the Dublin, the Irish Improvement, and other similar associations. These have especially tended to raising the position and character of the Irish landlord. They have imbued him with that greatest of all incentives—an actual pleasure in the pursuit. He appears now continually in entries and lists of prizes as a breeder and an exhibitor. In fact, for some time past he has been rather too strong here for the farmer himself. It was a move, however, in the right direction: impossible as it must be for "My Lord" or "the Marquis" to have a herd of Durhams or a flock of Leicesters without the tenantry eventually benefiting by the use of them. The country is now coming surely to reap the fruits of all this. Year after year, as we have to report on our annual visits, some new district is invaded. Another great man learns to take a pride in the cultivation of his property, and the consequence is already apparent. Never, we are assured on the authority of the Irish Lord Chancellor, was the kingdom doing so well, while we leave it to his Lordship to trace back how much of this is associated with the advance of agriculture. Thus comparatively early, too, in its history, an observant Englishman, referring to the best kinds of stock, declares it "an extraordinary thing that while in England the breed of shorthorns was almost restricted to certain districts—at any rate was not spread over the country, as it appeared to be in Ireland—he thought he was justified in saying that Ireland appeared to be a nursery of shorthorns; for whether it were in the beautiful and romantic Kerry, or in the mountains of Wicklow, or the plains of Meath, shorthorns appeared to thrive and flourish everywhere. He presumed it was

because this was really and truly the 'green isle,' and it seemed that where a shorthorn got good grass there it would thrive well. He did not know whether it would be correct to say that this was a country of milk and honey, but he was quite certain that it was a land of milk and beef." More than this, the Irish have not only the shorthorn distributed all over the island, but there are those who maintain that they have also some of the best of the breed.

And this brings us to another branch of the subject. We will not be content with only what the Lord Chancellor, Lord Clancarty, Sir Edward M'Donnell, or the Honourable Mr. Hancock could say in Dublin. The Irish tenant-farmer, too, will learn to speak for himself about his own business. There has been recently published a letter addressed to Captain Croker, the late Secretary of the Irish Agricultural Improvement Society, and written by Mr. Luke Christy, an Irish tenant-farmer. We do not hesitate to rank this as one of the most able and useful communications on the breeding and showing of stock that we have ever met with. For years past, as our readers are aware, have we been denouncing the injurious and absurd condition to which breeding stock are brought. But it has been hard work to get breeders to go with us. As a rule, they have rather upheld the practice; taking care, of course, to keep very quiet on the losses they themselves have sustained by the system. But it is refreshing to hear a man speak out like Mr. Christy, and to see him parade such beautiful victims as Bridesmaids, May Queens, and Kilbogget Lassies, before the blushing offenders that have gained such costly victories. We repeat that so far the prosperity of agriculture in Ireland has been mainly attributable to the agricultural societies. But it will never do for our friends across the Channel to follow our example, and obstinately shut their eyes to the abuses of these associations. It is weakness to say they cannot be put a stop to; and even if some influential culprit does retire in dudgeon, perhaps so much the better. The Council of the Irish Society must encourage such men as Mr. Christy to speak out, and must act on what they say. It is but arguing a truism, after all, to show the fallacy of breeding from over-pampered animals; *but not a tithe of these evil consequences is ever known*, and he does good service who exposes them. It is, in fact, simply a plan of obtaining prices and prizes on false pretences; and we are by no means sure but the judges should be included in the indictment.

It speaks well for the progress of the sister-kingdom when she can enforce such a lesson as this upon us. Let it not, however, be lost upon herself, and we shall have Ireland, by one of the most tangible of tests, taking high rank in the pursuits of agriculture. There is certainly every hope of her doing so. At the last Council Meeting of the Improvement Society Mr. Douglas' famous two-year-old heifers were disqualified as not having bred. The white heifer, bought of Mr. Booth, was never in calf; while the poor Queen of Trumps died on her voyage out with a calf in her. It appears rather hard to withhold the prize in this in-

stance, but the principle of insisting on a live calf is itself thoroughly sound. It goes directly to the correction of the abuse.

MR. DOUGLAS'S PRIZE HEIFERS.

The following letter was read at the last Council Meeting of the Royal Agricultural Improvement Society of Ireland:

"Athelstaneford, March 23, 1859.

"MY DEAR SIR,—The heifer I showed at Londonderry, which was awarded the first prize in the two-years-old class, also the Purcell challenge cup, was sold by me to a Mr. Barrett, of Henderson, Kentucky, at a very long price, and warranted in calf. She sailed from Londonderry in November last for New Orleans, but along with a number of others died on the passage, from the severity of the voyage. Mr. Black

(brother-in-law to Mr. Barrett) of Lislass, Omagh, Co. Tyrone, was entrusted with carrying out the arrangements of the shipment, &c., and can testify to the fact as I have stated. I can give you my word and honour the Queen of Trumps was in calf to the bull Sir James the Rose, and can afford certificate from the herdsman that such was the case. I believe this information will be satisfactory to you, and will feel obliged by your forwarding me the premium. Venus de Medici has not qualified herself.

"Mr. Black will be at the Royal Dublin spring show, and you can see him there. I shall not be present.—Yours, truly,
"J. M. Roysse, Esq." "JAMES DOUGLAS.

Resolved—"That the secretary do write to Mr. James Douglas, and express the regret of the council that, as the heifer did not produce a live calf as required by the condition in the premium sheet, the prize cannot be paid to him."

THE ROYAL DUBLIN SOCIETY.

SPRING SHOW.

The Annual Spring Show of this Society has just passed off, and, on the whole, very successfully. The Irish breeders turned out well; at the same time they were not allowed to retain all the honours, their English friends having taken a fair place, and given them something to do as well as to think upon. Last year the challenge cup of the Society went to Athelstaneford; this year it goes to Lancashire, very near Towneley-hall where the former cup found its final destination. Whilst, therefore, the Emerald Isle has done well, it must put on the steam and do something better yet, if there be any desire to retain that trophy which is so peculiarly their own.

In former times the Spring Show was held in open yards, with ranges of sheds, where the cattle were neither comfortably lodged nor were they seen to advantage. Last year a new hall was opened for the purposes of the meeting, and although it is still unfinished, it affords a vast accession to the comfort of the animals as well as to the visitors. That it is not entirely finished does not, we regret to say, augur well for the public spirit of our Irish friends; and we think that, for their own sake, they ought not to lose time in subscribing such an amount as will allow the Society to put the finishing touches to their really commodious and handsome building.

The Spring Show of the Dublin Society has, for several years, been much resorted to by those who were desirous of procuring young bulls, especially of the short-horned breed; and, as a consequence of this demand, the yearling-bull section is always a very prominent feature in the show. It is true that many of the animals brought forward were, like Pindar's razors, got up more for sale than for use, and many brutes found their way into the show catalogue which ought never to have been kept as bulls. Some recent restrictive measures, amounting to a prohibition in the case of low-priced animals, have done good in weeding this department; and if numbers are fewer, the section presents a

more select appearance. Those who consider small prices the criterion of cheapness and excellenc, may no doubt regret the change; but all who know wherein their true interests lie, will rejoice in the comparative freedom which now exists from the annoyance of being crowded up by a mass of rubbish.

The great interest of the show in the cattle classes was, of course, centred in the short-horns. In the section of yearling bulls, Mr. Ambler's "Royal Turk" got the first prize. He is a nice and rather stylish animal, rich colour, nice shoulders, but not very good in his hind quarters. He was awarded also the medal as the second-best of all the prize bulls—the wisdom of both of which decisions was very generally disputed. A capital yearling, purchased by Mr. Allan Pollok, at Lord Dufferin's sale, was placed second; a position to which his good shape, particularly in his back and loins, and his prime quality, well entitled him. The third bull belonged to Col. Leslie—a little coarse, but having plenty of good hair, and otherwise a sufficient substance to make him very promising. The highly-commended and commended bulls, belonging to Messrs. Pollok, Keating, Wood, and Napier, were all of good quality, the first being a little narrow round the breast, and the latter perhaps not quite equal on the back. But we may say that the judges could have had no difficulty whatever in adding to the honorary list in this section.

The prizes in the two-year-old section were well contested; but there is not a doubt that the right one was in the right place, when Mr. Barnes' white bull, Dr. McHale, of regular and unmixed Warlaby descent, notwithstanding his Celtic cognomen, was placed first, although he did beat on this occasion Sir Colin, the gold-medal bull of the Derry show. Dr. McHale is throughout a prime bull, his back and loin unimpeachable, and we do not hesitate to say that he was the best bull in the show of any age, although he did not get the medal as such. Sir Colin is unquestionably a good bull, but he is a little coarse in the shoulder, and a little

leggy, and we may mention, for the benefit of all concerned, that he too claims Warlabby as the "home of his ancestors." Amongst the highly commended in this section was Mr. Ellison's Baron St. Leonards, which ranked as the third yearling at the spring show in 1858, receiving also a commendation at the Derry meeting of the Royal Agricultural Improvement Society; the others were Mr. Maxwell's Havelock, by Musician, a bull bred by Col. Towneley; Mr. Pollok's Bandy, by the former prize bull Bamboo; Mr. Seaton's Jacob Faithful, by Jacob, another victor at former shows; and Mr. Chaloner's Candidate, by Hopewell.

In the three-year-old section the first prize was taken by Capt. Bunbury's Cornet. This animal was second in the two-year-old class last year, and is a son of the prize bull Cadet, of Warlabby descent. He has a capital shoulder and back, and although he has a little of his sire's hair, has a good touch of flesh. Mr. Barcroft's Beau, of Kilbogget, a bull of considerable substance, was second; Mr. Christy's Emblem, Mr. Pollok's Imperial Prince, and Col. Leslie's Fugleman received each honorary certificates.

The next section contained all shorthorn bulls calved prior to 1856, amongst which there were several of more than ordinary merit, and prize winners in their day. The first prize was given to Priam, belonging to Lord Talbot-de-Malahide, a bull which is very defective behind the shoulder, but was the prize bull in his class at the Waterford Meeting of the Royal Agricultural Improvement Society in 1857, and also at the Spring Show, last year. A tolerably good bull, belonging to Mr. Roe, got the second prize, being precisely the same rank as that which he attained at the Dublin Society's Show, last year; but a place to which he was scarcely entitled on this occasion, seeing that he had Mr. Ball's Jacob against him, to which the judges gave an honorary certificate. Jacob was the prize bull in 1856, and also on other occasions; is a son of Hopewell, and of the Victoria race, by his dam. When we find an animal of his quality put behind such a bull as that which got the second prize, we are apt to feel inclined to ask why quality is so specially desired, seeing that it, as well as other important points, have apparently been overlooked in this case. Mr. Welsh's Sir Colin Campbell, bred at Athelstaneford, was also justly highly commended, whilst Capt. Bunbury's, Mr. Rutherford's, and Mr. Jones's bulls were commended. The two former are somewhat allied in blood, the sire of the one and the grandsire of the other, by the dam's side, being Druid (10,140).

In the yearling heifer class, Mr. Ambler stood first, as he did in the corresponding class of bulls. His Lady Blanche is a very sweet heifer, of good quality, good back and loin, and a prime coat of hair. Next to her come Mr. Thomas Lee Norman's Maradan the Seventh; also a nice animal, but deficient behind. Fair Maid, also belonging to Mr. Norman, was commended; and the further list of honorary awards in this section consisted of Mr. Fitzwilliam Welsh's two heifers, Pride of Douglas, and Maid of Islanmore; Lord Monk's Myrtle 13th, and Red Nell Gwynne;

Mr. Jones's Lady of the Bath; Major Stanley M'Clintock's Zingara; Mr. Christy's Limerick Lass the Third; and three capital heifers, belonging to Capt. Ball, viz., Letitia, Agatha, and Josephine. Such a list of high commendations tells at once the character of the class, which, indeed, was even more than usually good.

The two-year-old heifer section was the most hotly contested in all the exhibition, and presented an array of excellence which is very rarely to be met with. The first prize was awarded to Lord Clarina's Charity the Second, a magnificent animal, taking her in front, but very decidedly inferior behind. She has a fine arched rib, and her hair and touch are excellent. She is by Lord Derby (12,694), and her dam by Booth's Forest (10,240). The second place in the section was taken by Luna, a heifer now belonging to Mr. Welsh, of Limerick, but bred by Mr. Sanday, of Holme-Pierrepoint. Her loin is capital, and her quality good, but she is not to say an even heifer. Besides these two heifers there were four highly-commended and two commended in this section. The leading heifers amongst the former were Capt. Gunter's Moss Rose, and Mr. Barnes' Lady Hopewell. We need scarcely remind our readers that Moss Rose was the second heifer in her class at the Northallerton show, and it has occasioned a great deal of surprise that she only got a third place in Dublin. Lady Hopewell (Barnes') is a noble heifer, was second at Derry, and is more equal than either of the two prize heifers, whilst Moss Rose again, if anything, excels even her in this respect. The inference is, therefore, that a third for either of those two heifers was the wrong place. We freely and frankly admit the eminent grand qualities which the winning heifers, particularly the first placed, possess; but we maintain, at the same time, that neither of them is equal throughout to either Moss Rose or Lady Hopewell. The other two highly-commended heifers were Capt. Gunter's Fair Maid of Wetherby, and Mr. Campion's Lady Barcroft; whilst the simply commended were Mr. Lee Norman's Princess Royal, and a heifer belonging to Sir Percy Nugent.

We have already mentioned that the "Irish Farmers' Gazette Challenge Cup" comes again to the English side of the Channel. This, together with the Gold Medal given for the best of all the prize breeding heifers, giving milk, or in calf, and the special prize belonging to the three-year-old class, was awarded to Mr. Richard Eastwood's heifer Rosette, bred by Mr. Wetherall, and thus adding another laurel to the many which already grace the Aldborough herd. Rosette is almost a perfect beauty. Her fine head, neck, and shoulders, which are so beautifully run into one another, is a complete picture; her barrel is also magnificent, and were it not for a droop in the hind quarters, she must be declared faultless. Following her in the class came the appropriately-named Sweetheart, bred by Mr. Grundy, and now the property of Mr. Welsh, of Limerick. Sweetheart is a very equal heifer, well made up in all her best points, and will yet do greater things, or we are much mistaken, if all goes well with her. The

honorary commendations in the section were confined to Mr. Welsh's Maid of Kilbogget and Mr. Christy's Queen of Beauty the second. The Maid was the winner for her breeder Mr. Barcroft, in 1857, when a yearling, of the Challenge Cup; but last year she stood third to Mr. Douglas's two grand heifers. She calved lately, and when shown was "out of sorts." Mr. Christy's Queen is a remarkably fine animal in many respects, particularly in her shoulder, back, and loin.

The last section in the shorthorn division was allotted to cows of any age, in calf, or having had a live calf within twelve months preceding the date of the show; and in this section Mr. Ambler stood again the winner of the first prize. His cow Woodbine, bred by Mr. R. Dudding, Panton, Wragby, has proved herself first-rate at Chester, and at many other shows in England. She again takes home the special prize in her class, and the Gold Medal as the best of all the milch cows in the yard. Mr. Welsh, of Limerick, was second with a very good cow, bred by Mr. Maxwell, of Croon.

The judges of shorthorns were H. Smith, Drax Abbey; George Atkinson, Seaham; and James Parkinson, Layfields.

The chief interest of the Show, at least in the cattle section, was of course confined in a great measure to the Shorthorns; and if it had not been for the Kerries, the back alley of the building, which was occupied with the "miscellaneous breeds" would have been comparatively neglected. The Kerries, however, being such favourites with the Irish ladies, drew around them a constant stream of fair admirers, and certainly some of the animals exhibited were unique specimens of the bovine race. This breed is very little known in England; but we feel sure, that if known, it would be much run upon, especially by the occupants of suburban villas, and others, who have not much ground at their disposal, but who would at the same time feel desirous of enjoying the benefit of their own dairy, with the possession of a pet cow. The milk of the Kerry is very rich, and produces more butter than that of the Ayrshire and some of the other breeds which are considered as being specially dairy cattle. They are of different colours, most of them being black, or black with large patches of white, brown, and brown with a white or strawberry back. Some of the specimens of cows in-calf exhibited in Dublin did not much exceed 36 inches in height, and although others were rather larger-sized, the breed is diminutive, and occupies the same place amongst cattle as the Shetland pony does amongst horses. The principal exhibitors at Dublin were, Lord Charlemont, Hon. W. Talbot, Sir Edward McDonnell, Mr. Ralph Cusack, and Mr. Champion.

In the other breeds which were included in this division, there were several fair Devons exhibited by Lord Charlemont, and Scotch polled by Lord Talbot de Malahide and Mr. Allan Pollok. At one period the Angus and Galloway breeds appeared likely to occupy a fair position amongst Irish cattle; but the all-conquering Short-horn has tended to prevent this, although occasionally some good lots are to be met with, amongst which the herds belonging to the two gentlemen we have named, to Lord Lurgan, and one or two others, whose

names we have met with in the catalogue of bygone Irish shows, stand pre-eminent. Those breeds, however, would be found very profitable on some of the middling classes of land in Ireland, and they produce, as our readers well know, a splendid description of cattle, when crossed with the Shorthorn. Lord Talbot's cow was, we were informed, exhibited by his Lordship at Paris in 1856, and was a winner at that Great Exhibition of All Nations. The specimens of the other breeds in the division scarcely deserve special notice.

Considering the character of the show of fat stock which was held in Dublin in November last, we expected to have seen a better exhibition at this time; but we were disappointed, and the best animals in the division were Lord Shannon's Devon ox, Mr. Christy's Shorthorn cow, and Mr. Pollock's Kerry heifer. With these exceptions, the animals brought forward were not above mediocrity.

The entries in the sheep sections were fully as numerous as usual; but this department of the Spring Show in Dublin is seldom overcrowded. The Leicester Class was generally very good; and in the shearing rams, Mr. Owen got first and second prizes with two prime sheep, the first having been bred by himself, and the second by Mr. Torr. Col. C. P. Leslie, M.P., received a commendation for his shearing, bred in Scotland. In aged rams, Mr. Owen was again the winner of the first prize with his three-shear ram—very good in back and breast; and Mr. Themder was highly commended—being equivalent to second prize—for his three-shear ram. Both of these sheep were bred by their exhibitors. Mr. Themder's two lots of hogget rams took first and second prizes. These were both very good lots, and descended from the flocks of Messrs. Sanday and Cresswell. A pen of stylish ewes, belonging to Mr. Owen, got the first prize in their section; and Mr. Riall's pen was highly commended. Mr. Livingston Thompson also exhibited a lot of very nicely-bred Leicesters in this section. In ewe hoggets Mr. Owen and Mr. Themder were again first and second. Some of the other lots in this section were also of a good sort.

In long-wooled sheep not qualified to compete as Leicesters, Mr. Beale Browne had it nearly all his own way, having got all the first prizes in the class; Mr. David Kerr, a well-known Irish breeder, of long-established repute, being second to him in the shearing and hogget ram sections, and Mr. Bole in that of ewe hoggets. Still we thought that Mr. Browne's sheep were, in some cases, scarcely as good as we have seen him exhibit at other times.

In the short-wooled class, nearly every animal shown were Shropshires, a breed which is fast gaining favour in Ireland, and many of the pens were from the flocks of some of our best Midland breeders. The judges, however, were apparently prepossessed in favour of long-wools, and, consequently, a more open fleece, with a longer staple than belongs to the Shropshire, was preferred by them, wherever there was a choice. The successful exhibitors were Mr. Broughton and Mr. Hamilton.

In the Cheviot class there were some good sheep shown, but the competition there was confined to two exhibi-

bitors—the Marquis Conyngham and Lord Clermont. The prizes were pretty well divided, Lord Clermont being, on the whole, the most successful.

The Irish shows are always well supplied with a good, useful description of swine, and the Dublin Society's exhibition was no exception to the general rule. In the coloured breeds the successful exhibitors of boars were Lord Clermont, Drs. Taylor, Radcliff, and Collins, and Mr. Rutherford. Of coloured sows and litters, Messrs. Macken, Joyce, Metge, Sugden, Tomkinson, and Wilson. The pure Berkshires, with few exceptions, were those which took the lead in this class; and whilst there were some excellent animals shown, particularly by Lord Clermont and Mr. Joyce, it struck us that, as a class, the coloured were not equal to the white. The breeding sows of the white breeds were the best we have seen at any of the Irish shows; and it appears to us that the white breeds are now more in favour in Ireland than even the Berkshires. The boars shown on the part of the Irish exhibitors by Lord Lurgan, Mr. Ellison, Mr. Patteson, and Mr. Peart, were exceedingly good; and the credit of England was well sustained by Mr. Wilkinson, of Roundhay, Leeds, who was also a successful competitor. In the best section of this department, breeding sows, Lord Lurgan and Mr. Peart were the prize winners; and in the litters Messrs. Pollok, Ellison, and Metge took first prizes, and the Duke of Leinster, Mr. Pollok, and Mr. Rutherford second.

We cannot say much in favour of the poultry exhibition. It ought to have been a great deal better, considering that poultry and their products form a not inconsiderable item in the receipts of the class of small occupiers which forms such a large proportion of the Irish tenantry. A great export trade is carried on in these articles from every part of Ireland from which a steamer sails; and the universal dissemination of the best breeds of a useful kind—such as the Dorking and Spanish fowl and the Aylesbury duck—is most desirable. As it is, the best lots appear to be in the hands of two or three individuals, whose names we meet with in the catalogues every year, without much variation, or addition to their numbers. The best lots of Cochins were those exhibited by Messrs. Lugton and Wight. Of Dorkings, by Col. Leslie and Mr. Farrel's were very good; Mr. R. P. Williams also very good, and Mr. Perrin. The two latter gentlemen, with Mr. Warburton, exhibited some very fair Spanish. In spangled Hamburgs Mr. R. P. Williams was successful, one of his lots in particular being very fine, whilst he was no less fortunate with his white-crested black fowl. Col. Hill's turkeys, Mr. Hyland's Aylesbury ducks, and Mrs. Green's Rouens were the best in their respective sections.

The show of horses, which are chiefly of an agricultural class, is held on the last day of the exhibition, and from want of sufficient room and of proper arrangement, the inspection of this department at the Spring Shows is always an unsatisfactory piece of business. Stallions of all kinds and ages are mixed together in one part, and mares, colts, and fillies in another; and this must continue to be the case, until a sufficient amount of space is provided for all the purposes of the show. Some years ago, when we began first to attend the Spring Shows of the Royal Dublin Society, the horse department attracted very

little attention; but the case is altered now, and the Spring Meetings bring together a considerable number of stallions, which although, perhaps, not of a first-class description, are yet of a more useful character than we have seen them. It occurs to us, that the prizes offered are not sufficiently large to induce the owners of first-rate draught stallions to send such for competition in Dublin; and we have no hesitation in saying that if the Society would make the prizes something worth contending for, there would be no lack of good horses. The prevailing breed was the Clydesdale; and although some were importations from Scotland, they were not up to the mark of stallions of this breed, which one meets with at the shows of the Highland Society, when such are held at Glasgow. There were also some Suffolks, and a Norman horse. The best stallion on the ground was Mr. Milloy's *Diamond*, a bay Clydesdale, which has gained several prizes on former occasions both at the shows of the Royal Dublin, and the Agricultural Improvement Society. He was bred in Scotland, has good shapes and light action. On this occasion he only got an honorary certificate, his previous successes having precluded him from obtaining the special prize. In the section of stallions foaled prior to January, 1855, Mr. Rogerson's chestnut got the prize. He is a strong substantial animal, but a little coarse. Mr. Mill was second with his five-year-old Clydesdale. In the next section, that of stallions foaled since 1855, there were nine entries, but none of sufficient merit to obtain any of the prizes. Two Clydesdale mares, belonging to Mr. Boyle and Mr. Welsh, got two prizes in their section. They were of a very ordinary sort. No merit in the colts, and Mr. Rogerson and Mr. Durie got first and second prizes for their fillies.

IMPLEMENT'S.

Owing to the space which is now taken up by the new buildings which are in course of erection on the lawn behind the Society's house, the bounds allotted to the implement section were more circumscribed than they used to be. However, the arrangement of the sheds was well contrived, and not an inch was lost which could be rendered available. The Society does not award prizes for implements; but owing to the fact that many of the Irish gentry and farmers being themselves out for procuring a supply, or giving their orders at the Spring Show, there is always sufficient inducement offered to manufacturers to come forward, and on this occasion there was no lack of English as well as of Irish exhibitors. We shall not enter into a minute report of the lots which were shown, because they have, for the most part, been already reported upon in our columns, but shall confine ourselves to a brief summary of the names of the principal exhibitors, with the different articles belonging to each.

RICHMOND AND CHANDLER, of Salford: Chaff machines, corn and oilcake-crushers, linseed mills, turnip-cutters, steaming apparatus, grubbers, chain harrows, haymaking machines, horse rakes, turnip drills, broadcast seed-machines, &c.

THOMAS PERRY AND SON, Bilston and Glasgow: An assortment of field gates, stable fittings, hurdles, wire fencing and netting, iron garden-chairs, &c.

FREDERICK MASON, Ipswich: Portable boilers with registered steamers for cooking food for cattle, &c.; oilcake and bean grinding mills, and chaff engines.

- THOS. BIGG, Southwark : Sheep-dipping apparatus.
- TREE and Co., London : Draining-levels, agricultural barometers and thermometers, cattle gauges, &c.
- A. and J. FRY, Bristol : Oilcake mills, corn-dressing machines, seed and manure drills, grass seed distributors, turnip drills, chain harrows for one and two horses, horse hoes, horse rakes, chaff machines, oat and bean crushers, &c.
- THOS. KEENAN and SONS, Dublin : Saws and axes of different kinds, apparatus for blasting roots and stumps of trees, tools for wire-fencing, forester's tools, lawn-mowing machines on an improved principle, &c.
- W. and J. RITCHIE, Ardee : Drill corn-sowing machines farm carts, winnowing machines, sowing and drill (ridging) ploughs, grubbers of different sorts, ribbing machines, turnip and mangel sowers, &c.
- W. M. CRANSTON, London : Reaping and mowing machine for cutting grain and grass.
- E. H. BENTALL, Maldon : Double-ridge horse hoes, harrows, oilcake mills, root-pulpers, patent broadshare and cultivator.
- JAMES EASTWOOD, Blackburn, Lancashire : A variety of compound-action churns for hand or power.
- JOHN EDMONDSON and Co., Dublin : Ploughs, horse-hoes, harrows, patent trussed whipple-trees, horse rakes, chaff cutters, one-horse gear, steel oat mills, oilcake breakers, turnip cutters, all by Ransomes and Sims ; Dentall's ridging-plough, Nicholson's haymaker, Samuelson's ditto, Harris's drag rakes, Fry's horse rakes, Picksley and Sim's chaff cutter, Fry's root pulper, Hunt's brush drills and cup drills, Parke's steel digging forks, &c., &c., and a collection of seeds and roots.
- RANSOMES and SIMS, Ipswich : Portable steam engines, thrashing machines, haymakers, drag rakes, bruising mills, root cutters (Biddell's), &c.
- ISAAC JAMES, Cheltenham : Liquid manure carts and pumps, washing machines, &c.
- JOSEPH BOOTH, Dublin : A general assortment of tools for the use of foresters, hedgers, and mechanics.
- GARRETT and SONS, Saxmundham : Steam engines and thrashing machines, corn drills, seed and manure drills, manure distributors (Chambers'), horse hoes, corn dressing machines of different sorts, grinding mills, oilcake breakers, patent saw benches, haymaking machines, drag rakes, "Eagle" mowing and reaping machine, Chambers' patent drop levers &c., &c.
- J. BANKS, Liverpool : Wrought iron fencing, hurdles, gates, netting, garden seats, wire work, pig troughs, clod crushers, Norwegian harrows, turnip drills, pulpers, corn bruisers, chaff machines, chain harrows, cast iron rick-stands, portable furnaces and boilers, &c.
- JOHN STARKEY & Co., Liverpool and Leeds : Several varieties of washing, wringing, and mangling machines, garden chairs, &c.
- THOMAS PEARSON, Dublin : Burr millstones, corn screens, separators, winnowing machines, and different kinds of wire-work.
- J. J. MITCHELL, Dublin : Portable steam-engine, thrashing machine, water carts, double-mould (ridging) plough, and farm carts.
- ALEXANDER SHANKS & SON, Arbroath : Mowing and rolling machines.
- HUGHES & SONS, London : French millstones, iron blocks, mill balls, &c.
- SMITH & ASHBY, Stamford : Portable steam-engines, hay-making machines, steel and iron tooth horse-rakes, hand-rakes, portable flour mills, portable thrashing machines, circular-saw bench, chaff cutters, oilcake mills.
- THOMAS BRADFORD, Manchester : Different kinds of washing, wringing, and mangling machines.
- W. C. CAMBRIDGE, Bristol : Press wheel rollers, chain harrows, and horse-rakes.
- PAUL & VINCENT, Dublin : Horse-rakes, turnip sowers, rollers, clod crushers, double mould (ridging) ploughs, swing ploughs, grubbers, reaping machines, hay tosser, and various samples of manures of which they are the manufacturers.
- SAMUEL ROWSELL, Chard, Somerset : Farm carts, gates, and horse-rakes.
- A. NIXON & Co., Liverpool : Portable steam-engines, and thrashing machines.
- JOHN HODGES & SONS, Dublin : Cattle steaming apparatus, malt cilies, iron cisterns, troughs, gates, wire fencing, &c.
- HENRY BRIDGES, London : A large variety of the new patterns of his improved butter prints.
- II. B. CHILDS, London : Potato digging plough and cultivator, and grain-dressing machines.
- PICKSLEY, SIMS, and Co., Leigh : Chaff-cutting machines, gorse cutters, linseed, malt, and oil mills, bean mills, flour mills, turnip cutters, pulpers, root graters, gorse mills, washing machines, mangles, lawn-mowing machines, verge-cutting machines, garden rollers, garden chairs, pig troughs, poultry pots, handrakes on wheels, &c.
- E. ARCHER, London : A variety of household and garden machines.
- TURNER and GIBSON, Dublin : Steam boilers and steaming apparatus, iron piers, gates, models of roofs, ornamental castings, garden sofas, &c.
- W. DANIEL, Dublin : Washing machines, portable gas works, adapted for the manufacture of gas from either peat or coal.
- BROWN and MAY, Devizes : Portable steam engines, &c.
- CLAYTON, SHUTTLEWORTH, and Co., Lincoln : Portable steam engines, thrashing and dressing machines, portable mills for steam power, circular-saw bench, &c.
- A. MACDONALD and Co., Belfast and Glasgow : Field and entrance gates, straw cutters, turnip ditto, hurdles, wire fencing, and garden wire work.
- HUGH CARSON, Warminster : Chaff cutting engines for steam or horse power, chaff cutters for hand power, turnip cutters, horse hoes, cheese presses, &c.
- E. R. and F. TURNER, Ipswich : Portable steam engines, thrashing machines, roller mills, chaff cutters, and oilcake breakers.
- BURGESS and KEY, London : Reaping machines, mowing ditto, and grain separators.
- JAMES HAYWOOD, Derby : Portable steam engines, thrashing machines, saw-bench, &c.
- JOHN HOWIE, Glasgow : Fire-clay mangers, sewerage pipes, drain tiles, &c.
- HERNULEWICZ & Co., Westminster : Iron gates, hurdles, garden chairs, wire fences, land rollers, grubbers, weighing machines, &c., &c.
- GALLON, BEAN, and LUMB, Leeds : Mortising machines.
- N. SMITH, Tarapston : Horse-rakes, steorage corn drills, turnip and mangel drills, chaff machines ; bean, oat, and cake mills, &c.
- JOHN WILLIAMSON, Kendal : Portable thrashing machines, steam engines, and patent vortex turbines, &c.
- RICHARD HORNSBY & SON, Grantham : Portable steam engines, thrashing machines, dressing ditto, corn drills, &c.
- MUNRO & Co., Bristol : Hayrakes, drills, chain harrows, &c.
- BARRETT, EXALL, & ANDREWES, Reading : Portable

steam engines, thrashing machines, hay machines, horse rakes, grain mills, chaff cutters, &c.

W. GRAHAM, Dublin: Steam engine, thrashing machines, chaff cutters, turnip sowing machines, swing ploughs, grubbers, harrows, clod crushers, &c.

GEORGE TURNER, London: A variety of small machines for household use.

JOHN MAGUIRE, Dublin: Patent stoves, wheat mills, churns, &c.

FERGUSON & Co., Dublin: Specimens of a variety of articles in gutta percha, including portable manure and other pumps, millbands, &c.

O'BYRNE & Co., Dublin: Washing machines, churns, &c.

R. & J. REEVES, Westbury, Wilts: Patent dry manure distributors and corn drills.

A number of manure manufacturers and agents had stands in the yard, amongst which were the Dublin Manure Company; J. Perry, Dublin, superphosphate of lime, &c.; Rogerson & Co., Dublin, guano, blood manure, &c.; Purdons, Dublin, phospho-Peruvian guano, &c., &c.

EVENING MEETING.

DISTRIBUTION OF PRIZES.

The evening meeting for the announcement of the awards was held in the Theatre of the Royal Dublin Society House, at half-past eight o'clock. There was a crowded attendance, and amongst those present were—The Lord Chancellor, the Lord Mayor, Mr. Justice Hayes, Hon. George Handcock, Dr. Adams, Dr. Johns, Mr. Alexander Parker, Mr. James Haughton, Mr. C. Hamilton, Alderman Campbell, Sir E. McDonnell, Mr. R. Montgomery (secretary, Zoological Society), and Joseph Hone, jun., &c.

On the motion of the Lord Chancellor, the chair was taken by the Earl of CLANCARTY, one of the Vice-Presidents of the Dublin Society.

Dr. WALLER, in opening the proceedings, said that our excellent and respected Viceroy had, with his usual courtesy and desire to advance the interests of the country, signified his intention to be present that night, as he had been on other occasions, at the distribution of their prizes. He however had, as secretary of the society, received a communication from him two or three nights ago, in which he expressed his deep regret at it not being in his power, in consequence of his being under the necessity of leaving this country for England, to take the chair as president of the society on that occasion. He (Dr. Waller) did certainly regret very much that they had not in the chair a nobleman who, he would say—without drawing any comparison between him and other Viceroys—was at all events distinguished in this, that he had a most ardent desire to promote the interests of Ireland on every opportunity that was afforded him of doing so. He said that, because it was the concurrent testimony of all parties, of all sects, and of all creeds in the country (applause). But while he regretted that they had not the President of the Royal Dublin Society in the chair, his regret was certainly mitigated, as far as it could possibly be, by the substitute they had the good fortune to see in his place (applause). In his stead they had the Senior Vice-President of the Royal Dublin Society—they had an Irish nobleman—and what was best of all, they had an Irish resident landlord—than whom a more useful, honourable, and better character did not exist (applause). They had one, too, who was pre-eminently suited to preside over such a meeting as that—a nobleman who thoroughly understood what cattle were, and who was himself a successful competitor on

every occasion in Ireland, and one who stimulated and promoted the best interests of agriculture in that country (applause). With respect to the show of that day he (Dr. Waller) had been informed by the best judges that such a show had never been seen in Ireland, or he might say anywhere else, for it was especially a show of short-horns; and at the Paris Exhibition they beat [the whole world in that class of cattle. The entries were about 400 black cattle, and a mere trifle under what they had on a former occasion, viz., 414; but practically he believed an increase, because he understood that of that 400 there was a greater number of black cattle for breeding purposes than on former occasions, there being very few of what were called butchers' cattle. There were 100 entries of sheep, and he understood the show of those animals was not only good in quality but extensive in variety, including Shropshires, short-woolled Cheviots, &c. The pigs he understood were very creditable, including the Essex, Hampshire, and York varieties. The collection of agricultural machines and implements was also extensive and valuable; and he had been particularly struck with those for reaping and mowing. The value of machinery of the kind, in enabling those who used them to anticipate the markets and to accomplish other objects, was incontestable, and it was very short-sighted and weak feeling on the part of the peasantry of that country to seek to check the use of machinery. They all recollected that attempts were made by the peasantry not long since to destroy agricultural machinery. Now, he was not going to philosophise with the poor man; that was not a wise thing to do, nor was he in the proper place for doing it; but perhaps that was the place to say a word or two to those who were the masters of the poor. It would be well if the gentlemen of the country would reason with those humble people who thought that machinery was the greatest evil that could befall them. The fallacy had been exploded in towns already. The artisan had already learned that the machine was not his enemy. Education had taught him that there were other physical means to be employed besides human labour; and the country gentleman should impress on the peasant that even if agricultural machinery were multiplied a thousand-fold, and if the population of the country were much greater than it was, still there would be enough for him to do; and that he should regard the agricultural machine not as his foe, but as his co-agent and friend. For he believed that in every country it would come to this at last, that the functions of the physical would be discharged by the brute, and the machine and the functions of the intellectual only would be discharged by mankind (applause). He believed he might say that the agricultural prospects of the society as exhibited in the show of that day were such as gave them very great reason to congratulate themselves. For, after all, the agricultural interests of a country like Ireland were the basis of its prosperity (Hear, hear), and the more they widened and strengthened, and deepened that basis, the stronger and more permanent, the more useful, and the more beautiful would be the structure which they would elevate upon it. The present show was admittedly one of the finest that had ever taken place in the country, and he trusted that on the next occasion they met they would have as good reason as they had now to say that the motto of Ireland was—as it certainly had been for some years past—"Progress."

Sir EDWARD M'DONNELL, in moving a vote of thanks to the English gentlemen who had acted as judges, dwelt upon the difficulties with which they had to contend in the discharge of the task which they had so kindly undertaken; and, when they bore in mind that these gentlemen had come over to this country at great inconvenience, the meeting would cordially join in tendering them a vote of thanks (applause). He re-

gretted that he had been called upon to propose the resolution, wishing that the duty had been entrusted to their excellent vice-president, Mr. Foote, who was much more competent to do so, and had been listened to with so much pleasure on many occasions (Hear, hear). They were indebted to the Royal Dublin Society for having been the first to introduce gentlemen from the other side of the water to act as judges, inasmuch as it gave confidence to exhibitors that they would at all events have impartiality. He did not mean to say that there were not gentlemen in this country who were perfectly competent in every respect to fulfil and to decide as to the relative merits of the various classes of stock exhibited; but it might be said that their judgment was influenced by local circumstances, whereas no such objection could apply to judges from the sister-country (Hear, hear). Another advantage of that course was that it kept up the connecting tie between the agricultural societies of England, Ireland, and Scotland (Hear); and they might expect that these judges would fearlessly state their opinions, and tell the people of Ireland whether they were improving or going back in agricultural pursuits. These annual shows had another valuable effect. If Irishmen were merely competing with one another, the same attention would not be devoted to the breeding of cattle that was now rendered necessary, in order to compete with the markets of the empire; and it was a gratifying fact that Dublin was considered the best market for obtaining prices (Hear, hear). To give some idea of the effects to which he had alluded on the country, he would read a return to show the immense increase that had taken place in the number of cattle produced. It was connected with the railway in which he was most interested; but he was sure the Midland Company could furnish a still larger return. In the year 1847 there were carried on the Great Southern and Western Railway 48,000 head of cattle. In 1850, when the line was open to Cork, 108,000; and in 1853, 332,000 (applause). These figures, he thought, showed some of the satisfactory results of the agricultural shows; and they owed a deep debt of gratitude to the Royal Dublin Society for the successful effort it had made to promote them (Hear, hear). He trusted that agriculturists, encouraged by the progress in the feeding of cattle, would also compete in improving the condition of their farms. Within one year, that nasty channel which divided the two countries would, he might say, be bridged across; and although there might be differences of opinion as to what harbour should be selected for the Transatlantic packet station, there could be scarcely a doubt that Ireland would become the great high road to America, and that would add materially to the travelling population of this country (Hear, hear). He had, in conclusion, to move a vote of thanks to those gentlemen who had ended their labours as judges, by giving perfect satisfaction to all parties (applause).

Mr. C. HAMILTON seconded the motion, which was passed by acclamation, on the suggestion of the Earl of Clancarty.

Mr. SMITH, in returning thanks, said that Sir Edward McDonnell had told them that the duty of the judges was a very disagreeable and arduous one. He assured them it was so; but he had imposed on him a still more disagreeable one (laughter), and on the part of the Englishmen who might be selected by the society to act on future occasions, he protested against, being called upon to make a speech in a public assembly like that, which was not so easy a task as the other which they had been requested to undertake. He was aware that the judges had a kind of stereotyped speech, but he should best consult convenience by not repeating it now (laughter); but though he did not mean to inflict a speech on them, he

could not sit down without taking the opportunity of referring to the great improvement which had been accomplished in the breeding of stock in Ireland through the instrumentality of the Royal Dublin Society. (Hear, hear.) He had had the pleasure of visiting the city on several occasions, and since he first came—about fifteen years ago—the progress had been astounding. (Hear, hear.) There was one feature in the exhibition of that day which he could not help adverting to—namely, that although the entries were, he believed, nearly as large as usual still there was almost an entire absence of those worthless and ordinary-looking animals that he had seen on former occasions (applause). Very few animals had been exhibited in the class of shorthorns that would not, fifteen years ago, have been considered creditable upon almost any man's farm, and he thought that the Royal Dublin Society merited the thanks of the nation at large for having been instrumental in improving—as he had no doubt it had been the means of doing—the breed of cattle in Ireland. (Hear, hear.) It was an extraordinary thing that while in England the breed of shorthorns was almost restricted to certain districts—at any rate was not spread over the country, as it appeared to be in Ireland—he thought he was justified in saying that Ireland appeared to be a nursery of shorthorns; for whether it were in the beautiful and romantic Kerry, or in the mountains of Wicklow, or the plains of Meath, shorthorns appeared to thrive and flourish everywhere. He presumed it was because this was really and truly the “green isle,” and it seemed that where a shorthorn got good grass there it would thrive well. He did not know whether it would be correct to say that this was a country of milk and honey, but he was quite certain that it was a land of milk and beef (laughter and applause.)

The LORD CHANCELLOR, on rising, was received with applause. He said—There is one species of live stock, which although not noticed in our list, I think we all take a very deep interest in, and I believe, upon [the character of that stock much of the happiness and prosperity of the country depends—I mean the resident nobility and gentry (applause); and I want, with your permission, to award a prize this evening, and one that ought to be carried by acclamation, to our noble chairman, who is, I think, not a bad specimen of that description of live stock (applause). It is a great gratification to me to hear the accounts of the progress of this society and of the progress of the agriculture of Ireland. We see what has been done by science and by art; and I remember, some years ago, speaking to the Lord Justice of Appeal about the prospects of Ireland, when they were very much less bright than they are now, and the observations he made were—I am sure I don't trespass on any matter of confidence in mentioning it; and of all the men I ever met he has the greatest power of emphatic and condensed expression of thought. It was before free trade was established, and I was speaking at the time of how Ireland was to battle against it. I asked him what he thought about it—whether it was his opinion that we would battle with it and get over it. His first observation was—“We must accept it whether we will or no” (a laugh); and then he said—“My belief is that there are recuperative powers in the soil of Ireland, and if we, like wise men, avail ourselves of the advantages of science and the use of skill and capital, we will more than get over the difficulty” (applause). When I was beginning my career in the House of Commons, Ireland was in a very depressed state; and everyone was proposing his nostrum for the benefit of Ireland, and there was every variety of theory as to how Ireland was to be relieved. The old plan in Ireland was to cry, “What is government going to do for us?—what are you going to do for us in Parlia-

ment?" My notion was, "What are we going to do for ourselves? (applause.) But, however, one night in the House of Commons a good many theories were started, and I thought that one had not been tried yet, and I said, "Will you just let us alone for ten years?" (applause.) That was in the year 1849. Well, I stand here in the year 1859, and when I look back on that period, I own I entertain great hopes of the future prosperity of Ireland. I allude to the progress of its agriculture and how it has been improved by the application of science; and after all, science dignifies the meanest process. Dr. Waller has well alluded to the advantages that would be produced by relieving humanity from physical drudgery and labour; but that is not to relieve humanity from labour. I sometimes object to the phrase I hear of the "working classes," or "working men," as applied merely to operatives and mechanics, and others occupied in the lower departments of human labour. For myself, I say that I am proud of having been always a "working" man (applause). There are various modes of working. The good work of the influence of a resident landlord is one on which much of the moral life and health of the community depends. Oftentimes, owing to the absence of their natural proprietors, properties in this country come under my hand; and in such instances those moral influences which, in properties naturally circumstanced, contribute so much to social progress, are all removed, and in place of that a kind of coarse machinery is substituted, which I am afraid produces very bad effects in many places. There was one particular district of the country to which the attention of the House of Commons was directed as supplying the counties of Louth, Armagh, and Monaghan with a large proportion of the crime committed in them; and the matter underwent investigation by a committee. What were the peculiarities of that district? There was the small cotter population—the miserable two-acre farm, and the inhabitant living on the potato—there was the absence of all the proprietors—the presence of the Court of Chancery and its receiver (laughter), and the secret society—all these things heaped together in that locality. Remove the causes, and you get rid of the effects; and give me the good resident-landlord discharging his duties faithfully as a worthy man, and availing himself of the position and influence that God has entrusted him with, in order to promote the happiness of those around him. I would say this of the Irish people—and I say it heartily and sincerely of them—that I do not think there are on this earth a people more susceptible of justice and kindness (applause); and I think they especially appreciate the kindness of their gentry. They respect the gentry. Master Brooke was once asked by Sir James Graham how he got the people to do certain things in connexion with a particular estate. "Oh," said he, "the Irish will do anything for a gentleman" (laughter and applause). At the time of the famine, when I corresponded with your lordship about the state of the west, knowing that you were one of those who took the deepest interest and did the most at that critical time, when all was apparently sinking there, I remember with what a heavy heart I used to go down to the House of Commons. What is the state of the west now? Look at the prosperity that is likely to come there. Its harbours appear to me to be destined by Providence to be a connecting link between America and the manufacturing districts of England. Look at that country, with its water-power; don't you think the capitalist will soon be there? With such men as the noble lord doing their duty faithfully amongst their tenantry, and with the application of science, skill, and capital, I see no limit to the prosperity of this country, and from all I know—and I have some means of knowledge more than I used to have

—I believe there never was a period when Ireland was in a more prosperous and healthy state than it is at the moment I am now addressing you (applause). I wish you, then, to give the noble lord a hearty vote of thanks to be carried by acclamation. I wish you to do so because he is a proprietor who, under great difficulties and trials in that part of the country, which thank God, has now risen above all its difficulties, has so nobly done his duty; and I wish you to give it because I think the influence of such men ought to be encouraged by the opinion and the approval of men like yourselves, who are so deeply interested in everything that concerns the welfare of this country. I was rejoiced this morning at receiving a letter from gentlemen who are concerned in establishing the Roman Catholic reformatory at Glancee asking me to contribute. Reformatories are now a great improvement. In place of punishing with vindictive severity and penal action those unfortunate persons who, through ignorance and temptation, are but too often precipitated into crime, we look on it now as more the duty of man to make one human heart—as Lord Carlisle has said—act upon another, and to endeavour by a reformatory process to reclaim the criminal (applause). Taking the two sections of the community, the Protestant and the Roman Catholic, I would say that they are now at liberty to contend—not like the thorn and the briar, which has the sharpest thorns, but like the vine and the olive, which will bear the richest fruit (applause). There is also a reformatory institution in Wicklow, and I got this morning a letter from them asking me to contribute. Well, now, I think it would be a very good thing, I confess, if there were a mutual contribution in good-will on the part of those who are competent to do it, of both religions (applause). I would follow the example which the noble lord sets in his community in these respects, and knowing no difference, but going on the principle of the constitution and civil equality. I would call upon you to do good unto all men, but especially unto those of the household of faith (loud applause). Like a true Irishman, I forgot the principal thing which I was to call attention to, namely, the memory of a nobleman who used to attend our meetings, and whose loss I think we ought all to regret as a great national calamity—I allude to the late Marquis of Waterford. I have a little memorandum about him, which shows the value of a resident nobleman such as he was. In giving an account of his establishment it states that he had a regularly-organized school in which his grooms were all taught by a master, and their minds improved, and a Sunday-school was kept for them; and that the farm, including grass, &c., extended over 4,600 acres. The day before he died he audited his account of expenditure upon labourers' houses, stables, dairy, and garden for the past year, which amounted to 11,000*l.*; and within the last few years he had expended, besides this, 12,000*l.* on farm-buildings. He had more than 300 head of horned cattle, and 1,500 sheep; and his weekly payments to labourers was upwards of 100*l.* During the last year he employed more than 300 labourers daily. During the years of distress, consequent on the famine, he daily employed upwards of 600 labourers. Not relying upon his own judgment as to the breed of cattle, his practice was to purchase prize animals at the shows in England and Ireland, and these were given for the use of the county and the tenantry. In order to afford employment to the people, a factory was established by him at Kilmacthomas for making Irish frieze, the whole profits of which went to the augmenting of the factory. 5,000*l.* was expended yearly on the county Waterford estate, and 3,000*l.* yearly on the county Derry estate. I think it right to allude to the memory of such a nobleman, and to say that while we honour the living we should not be forgetful of the memory of the dead.

The Hon. GEORGE HANCOCK, in seconding the motion of the Lord Chancellor, said there was one advantage of shows such as that of to-day which had not been alluded to. They brought the first noblemen and gentlemen of the land into friendly contact and free interchange of opinion with the working farmers (Hear, hear). He himself had laboured in the country in connection with farming societies, and he could testify to the great benefit which resulted from that intercourse. It broke down the barriers that used to exist between the peer and the peasant; and nothing was better than that the nobleman and the farmer should work together for the benefit of the community (applause). He was happy to say that in this country and in England the noblemen and the gentlemen did their duty. That was a fact admitted. The farmers were also doing theirs. England had attained to a great pitch of perfection, and he had no doubt that in a few years Ireland would be able to compete with her in everything. There was no reason why she should not do so, as we had a good climate and soil; and certainly we have a good people when they are properly treated (Hear, hear). Few had had more experience of them than he had, in managing one of the largest estates in Ireland; and he never met anything but straightforward conduct on the part of the people when they were met in the same spirit (applause). With such materials, he had no doubt that the country would go on prospering; and he was exceedingly glad that a nobleman like his lordship had taken such an active part in the management of the affairs of the country.

Lord CLANCARTY returned thanks for the kind and flattering manner in which his name had been introduced to the assembly and received by them. He expressed his regret at the absence of the Lord Lieutenant, who was not a mere formal president of the Royal Dublin Society, but one who had always taken an active interest in its proceedings, and had used his influence to strengthen their hands and enable them more effectually to carry out the objects which they had in view. He concurred in the opinions which had been expressed respecting the rapid progress which had been made in every department of agriculture in

this country. He regretted to say that he was not himself the successful exhibitor that Dr. Waller supposed him to be. He had listened attentively to the prize-list, in the hope of hearing his name mentioned, but was disappointed. He looked upon this, however, as an evidence of the very great improvement that had taken place in the character of the stock exhibited at these shows; for he had sent to the present exhibition four very fine bulls (laughter), not one of which had been successful in the competition (laughter). He confessed he thought this rather a singular circumstance (continued laughter). These animals might not have possessed all the qualities which the judges considered necessary; but, nevertheless, the people in the locality from which they came were strongly of opinion that each of them was entitled to a prize (laughter). It was a remarkable coincidence that the best of these bulls, the flower of the flock, was named Lord Palmerston (roars of laughter); but this very superior animal had not obtained the success in this great national assembly of bulls which might have been expected from his breeding and his reputation (laughter); and he would be obliged to go to the country again in the hope of better success in future in another assembly (great laughter). Another coincidence which might be regarded as a type of the harmony that prevailed amongst those engaged in agricultural pursuits was this, that in walking through the agricultural hall he observed the Museovite and the Grand Turk, Ignatius Loyola and Martin Luther, Lord Palmerston and Lord Derby, lying side by side in the most delightful spirit of harmony, though engaged in keen and active rivalry (loud laughter and applause). His lordship concluded by congratulating the meeting on the fact that though the calamities of war were impending over Europe, and upon the eve of a dissolution of Parliament, when the constituencies of the country were agitated by the approaching contests, the very men who were most actively engaged in party strife on the one side and on the other were assembled on that occasion, working cordially together for the promotion of agricultural improvement, in which they felt that the prosperity of Ireland was so materially involved (applause).

The meeting then separated.

REVIEW.

REVUE AGRICOLE DE L'ANGLETERRE,

Tome Premier.

PAR M. E. ROBIOU DE LA TRÉHONNAIS.

Paris: Libraire de Firmin Didot, Freres, Fils, et Co., Imprimeurs de l'Institut, Rue Jacob. 1859.

We recently inserted in our journal an article on "the corn laws of France," and the demand made by the agriculturists of that country upon the government for a renewal of protection, whether by the sliding scale or a fixed duty. In that paper we showed by facts taken from official documents, and quotations from one of the greatest agricultural writers of France, that the sliding scale, whilst it existed, had no effect in preventing extreme fluctuations in the price of grain; and that, on the other hand, its suspension has not occasioned any excess of importation beyond the requirements of the country when low prices prevail, as in the past year. The French Government, therefore, is perfectly justified in following the example of England, by throwing the corn trade open, with

the reserve of a fixed duty on imports *only*, for the sake of revenue. At the same time we referred to the different footing on which the farmers of France and England stand in regard to the land system, especially the law of inheritance in the former; and that in our opinion nothing can raise the agricultural interest of France but a complete change in that law, so as to put a stop to the interminable subdivision of the soil on the death of the proprietors.

Since that article was published we have received a copy of the work announced above, being an agricultural review of England ostensibly, but in reality a comparative view of the agriculture of that country and of France. We are glad to find that the opinion we expressed is fully borne out by the author, who intends to continue the work in numbers periodically, with the proposed design of indoctrinating his countrymen in the system of husbandry practised in England. No man is better qualified for this task than M. de la Tréhonais, who, with all his sympathies alive to the welfare of his native land, having lived twenty years in England as an agriculturist, has deeply studied the systems practised in both countries.

The work before us is the result of his experience and observation; and we consider its contents so important and interesting, that we willingly give a larger space to its review than we can ordinarily afford to publications of the kind.

This first number contains seven parts, as follows:—

1. Introduction.
2. Effects of Free Trade on English Agriculture.
3. History of Agricultural Societies in England. Part I—The Smithfield Club.
4. System of Culture without Manure practised at Lois Weedon.
5. Prize Machines at the Meetings of the Royal Agricultural Society of England.
6. Physiological Studies and Practice on the Crossing of Breeds—a paper read before the Scientific Congress at Auxerre, in September, 1858. Part I—On the respective influence of the Male and Female in Reproduction.
7. Biography—Jonas Webb.

In the introduction, the author speaks of the general movement in France at this time in favour of agriculture, as the apology for undertaking the work; and certainly, if the French agriculturists are disposed, or are able, to avail themselves of the example of those of England, the lucid, graphic, and, we will add, candid manner in which the English system is described by our author, is quite sufficient both to direct and to stimulate them to follow in the same steps. A short, but faithful history of English agriculture introduces the subject and shows that it is not long since England and France were upon a par in point of production; and, consequently, that whilst the former has made rapid strides towards a perfect system, the latter has remained almost stationary, if in some parts of the country she has not retrograded. "What conclusion," he says, do we draw from all this? That we must profit by this brilliant example of a people at our frontiers; we must study their practice, and the principles on which it is based, and then adopt it, with the modifications which local circumstances of climate, supply, and demand require. We must, above all, consider our cultivation, not as a miserable means of existence for ourselves and our metayers, but as industrial establishments, guided by the principles of commercial economy; in which we manufacture bread, meat, and wool, which ought to supply the markets of the world; meat, above all, for we must not forget the enormous sums paid by France for foreign cattle brought to our market, which are so much money lost to French agriculture, the resources of whose soil ought to feed and fatten four times the number of animals it now does. . . . The initiation ought to come from the proprietors themselves, they being the class most directly interested in progress. In France we leave everything to be done by the Government, whose action, all powerful as it is, is necessarily too general to produce appreciable results. Progressive action must be immediate, *individual* rather; exercised directly upon the soil, by measures of detail that the influence of Government cannot embrace. Each interested party must till his own fields; the prizes, meetings, honours, &c., are only encouragements to merit and not causes of progress. Let us accomplish the progress first, and then meet for the rewards we shall have merited by the results of our cultivation. To make no progress but with the view of obtaining prizes and honours at the meetings, is, in my estimation, only a barren deception, a false flash, ending only in ruin and ignorance," &c. (p. 26).

The effect of free trade upon English agriculture is upheld, and a similar benefit claimed from it for France; but it must be under a different system from the present. "I cannot shut my eyes to the obstacles that men and our institutions of routine have amassed on the hill of progress—the elements of progress and prosperity that already exist in English agriculture, and which demand only a ray of the sun of freedom to germinate and bring forth fruit, do not exist with us. We have neither the coal nor the iron at a cheap price, and the manufacture of agricultural machines consequently scarcely exist with us. The soil is overbur-

dened; it supports the mass of the taxes. In many departments the taxes on landed property amount to a fifth of the revenue; whilst the incomes of stock holders, manufacturers, merchants, and literary men pay absolutely nothing. Landed property is besides devoured by mortgage; its extreme division serves as a temptation for the little savings of the peasants, who sink in it, with an inexplicable eagerness, the capital which they ought rather to devote to the requirements of their cultivation; and it is still further reduced by the taxes on transfer. The town dues, by deducting before the sale the tax upon articles of general consumption, press upon agriculture and the poor populations of the towns, to the advantage of the urban proprietors and merchants. Thus, instead of being favoured, the natural and most advantageous markets for agriculture, that is to say, the centres of the working populations, are open to its products only across barriers, at which they are burdened with a tax which tends to restrict consumption. It must be admitted that it is not the consumption of the rich that causes agriculture to prosper, but that of the masses; and the more that consumption is facilitated, by rendering the exchange of alimentary commodities perfectly free, the more will the progress of agriculture be promoted. Here I stop. The reader has only to look over again what I have said of English agriculture, and to compare the advantages I have enumerated, with the state of our own, in order to measure in his mind the enormous difference that separates us from England. After that, can we be astonished at the slow and imperceptible progress of our agriculture?" (p. 55.)

He then goes on to enumerate the efforts of the French Government, or rather of the Emperor Louis Napoleon, to accelerate the prosperity of agriculture. "Shows, splendid rewards, honours, money, agricultural schools, and societies, studs of improved race, learned and zealous inspectors, a credit of 100,000,000 for drainages, a Bank of *Credit foncier*, missions to England, learned reports, the Institute, the Academy, the example of the Chief of the State himself; in a word, the influence of the Government, money, science and genius of France, &c., &c. Alas! with all these powerful powerful means, what results can we show?"

The conclusion arrived at by our author in summing up, is that there are "radical vices" in the agricultural interest of France which have not yet been touched. At the head of these he places the law of inheritance as requiring a "profound modification;" and goes on to enumerate, again, the drawbacks and hindrances before stated, as absolutely requiring immediate attention. We confess that we look upon the first as the main-spring of all other "vices;" and until that law is abrogated we do not believe it possible for agriculture to flourish. It is the want of intelligent cultivators, with capital to work with, that renders the progress of agriculture in France an impossibility. To tell the poor metayer that he must grow roots, keep cattle and sheep, purchase guano, drain his land, &c., is about as rational as telling an English peasant to go to the Court of Chancery for redress of an injury. Poverty in both cases is a bar to action.

The question then is, will it be possible to modify this leading "vice" of the land system in France, so as to render it innocuous? We do not believe it is; but that nothing less than its abrogation will remedy the evils arising from it. But De Lavergne says that this is the life-blood of the French nation, and to touch it is like touching the apple of the eye. Yet, on the present principle, neither free trade nor the most rigid protection will place the French agriculturists in a position of prosperity. And so says our author: "In the circumstances of financial legislation, routine, prejudice, and indefinite subdivision, to which the land in France is subject, free trade will be no more powerful to awaken agriculture from the secular torpor in which it reposes, than the official efforts have done for two years past."

The various other subjects of this "Revue" will be found very interesting to those who can read it in the original. We hope that M. De la Trehonnais will give a translation of it, for the benefit of those who cannot. The paper on the crossing of breeds of cattle is a highly philosophical essay, and contains facts connected with the reproduction of animals that ought to be known by all breeders. We shall look with interest for the next number of the work, but do not know whether it is to be monthly or a quarterly, as we find no intimation of the period of its appearance.

CORN AND GRAIN, &c.

RETURN to an Order of the Honourable House of Commons, dated 21st February, 1859;—for, Accounts “ of the different Varieties of Corn and Grain, Flour and Meal, reducing the latter to Imperial Quarters, Imported into the United Kingdom in 1858; stating the Countries whence the same were brought, and the Quantities brought from each, in 1858;”
 “ Of the Quantities of Wheat and Wheat Flour, the latter being stated in Imperial Quarters of Wheat, Imported into the United Kingdom during each of the Six Years ended with 1853; stating the Countries whence the same were brought, and the Quantities brought from each;”
 “ And showing in Imperial Quarters the Quantities of Wheat and Wheat Flour, Barley and Barley Meal, Oats and Oat Meal, Rye and Rye Meal, Peas and Peas Meal, Beans and Bean Meal, and of Indian Corn and Meal, entered for Consumption in the United Kingdom during each of the Six Years ending with 1858.”

AN ACCOUNT of the different Varieties of CORN and GRAIN, FLOUR and MEAL, reducing the latter to Imperial Quarters, Imported into the United Kingdom in 1858; stating the Countries whence the same were brought, and the Quantities brought from each, in 1858.

COUNTRIES WHENCE IMPORTED.	QUANTITIES OF CORN, GRAIN, MEAL, AND FLOUR, IMPORTED INTO THE UNITED KINGDOM IN THE YEAR 1858.									
	Wheat and Wheat Flour.	Barley and Barley Meal.	Oats and Oatmeal.	Rye and Ryemeal.	Peas and Peas Meal.	Beans and Bean Meal.	Indian Corn and Meal.	Buck Wheat and Buck Wheat Meal.	Bere or Bigg.	Aggregate of Corn, Grain, Meal, and Flour.
	Qrs.	Qrs.	Qrs.	Qrs.	Qrs.	Qrs.	Qrs.	Qrs.	Qrs.	Qrs.
Russia, Northern Ports	160196	2250	788586	8619	4008	..	1	..	..	963990
" Southern Ports	451936	325032	208919	18243	3565	..	310695	13	..	1318403
Sweden	10126	50708	427886	..	3222	..	..	..	..	492217
Denmark and the Duchies	301463	340787	180164	13507	26849	5290	..	51	875	868986
Prussia	629005	153408	100608	42593	61622	14322	..	..	..	1001563
Hanse Towns	203041	33859	22874	209	6445	31194	1769	54	..	299145
Other Parts of Germany	139026	3466	49245	..	65	17370	..	..	..	209172
Holland	82710	16970	32487	1	1075	14261	..	42	..	147549
France	1283465	240934	3037	6936	31	59228	98496	3278	..	1695405
Spain	5364	154	..	..	34	2165	15228	..	..	22945
Italian States	43279	10791	6009	1133	40	14454	193985	..	..	269641
Wallachia and Moldavia	133574	203324	4733	10067	..	..	431597	..	..	783295
Turkish Dominions, including Syria..	74928	217337	119	2708	1101	4297	162598	200	..	463288
Egypt	464652	47541	..	..	779	198316	68982	..	..	780270
British North America	161609	..	10874	6	43907	..	1234	1	..	217631
United States, including California..	1098871	..	825	1	4868	..	396107	9	..	1500181
Other Countries collectively	99924	14846	21739	119	366	50858	71536	36	..	259424
Total Import	5343469	1661407	1837905	104177	157977	412033	1752178	3684	875	11293705

AN ACCOUNT of the Quantities of WHEAT and WHEAT FLOUR, the latter being stated in Imperial Quarters of Wheat, imported into the United Kingdom during each of the Six Years ended with 1858; stating the Countries whence the same were brought, and the Quantities brought from each.

COUNTRIES WHENCE IMPORTED.	Quantities of Wheat and Wheat Flour imported into the United Kingdom in the Years					
	1853.	1854.	1855.	1856.	1857.	1858.
	Qrs.	Qrs.	Qrs.	Qrs.	Qrs.	Qrs.
Russia, Northern Ports	252,243	21,042	1	474,862	298,821	160,496
" Southern Ports	818,930	486,305	5	292,020	409,527	451,936
Sweden	3,643	15,796	35,855	10,708	5,731	10,126
Denmark, and the Duchies	294,926	252,304	318,061	178,078	288,714	301,463
Prussia	1,145,845	675,054	539,885	222,754	869,974	629,005
Hanse Towns	223,914	339,745	254,439	174,472	271,572	203,041
Other parts of Germany	185,417	155,538	199,567	71,910	145,871	139,026
Holland	57,732	33,511	61,897	28,930	45,278	82,710
France	341,444	205,874	51,358	29,962	130,639	1,283,465
Spain	103,614	202,103	443,876	181,383	8,604	5,364
Italian States	164,255	106,853	142,609	164,137	9,450	43,279
Wallachia and Moldavia	227,143	119,504	9,831	124,671	24,377	133,574
Turkish Dominions, including Syria..	251,343	163,366	84,694	152,151	16,359	74,928
Egypt	357,906	302,908	437,241	534,729	204,236	464,652
British North America	168,021	51,016	17,693	198,709	165,960	161,609
United States, including California..	1,532,641	1,152,170	414,371	2,105,534	1,069,288	1,098,871
Other Countries collectively	56,843	189,996	170,883	262,557	95,834	99,924
Total Import	6,235,860	4,473,085	3,211,766	5,207,147	4,060,285	5,343,469

AN ACCOUNT showing, in Imperial Quarters, the Quantities of WHEAT and WHEAT FLOUR, BARLEY and BARLEY MEAL, OATS and OATMEAL, RYE and RYE MEAL, PEAS and PEAS MEAL, BEANS and BEAN MEAL, and of INDIAN CORN and MEAL, entered for Consumption in the United Kingdom during each of the Six Years ending with 1858.

	Quantities of Foreign and Colonial Corn, Grain, Meal, and Flour, retained for Consumption in the United Kingdom in the Years					
	1853.	1854.	1855.	1856.	1857.	1858.
	Qrs.	Qrs.	Qrs.	Qrs.	Qrs.	Qrs.
Wheat and Wheat Flour	6,112,016	4,370,852	3,145,232	5,039,453	3,969,743	5,333,936
Barley and Barley Meal.....	324,033	548,948	339,351	722,944	1,619,435	1,661,031
Oats and Oatmeal	1,012,160	1,007,837	1,005,543	1,146,864	1,702,399	1,818,247
Rye and Rye Meal.....	70,869	2,383	247	29,148	77,056	101,343
Peas and Pea Meal.....	100,967	108,526	113,357	84,560	159,740	157,121
Beans and Bean Meal	349,440	335,031	341,808	352,480	304,972	411,548
Indian Corn and Meal	1,546,791	1,345,313	1,216,795	1,758,151	1,077,472	1,748,854
Other kinds (consisting of Buck Wheat, Buck Wheat Meal, and Bere or Bigg).....	3,051	913	3,626	1,011	2,793	4,560
Aggregate Consumption	10,024,347	7,760,803	6,165,959	9,184,511	8,985,610	11,266,690

NOTE.—The quantities of imported corn and meal retained for consumption in the United Kingdom, as exhibited above, are ascertained by deducting the quantities over-entered, and the quantities exported after payment of duty, from the gross quantities charged with duty on importation.

Office of the Inspector-General of Imports and Exports, Custom House, London,
28th February, 1859.

JOHN A. MESSENGER.

SALE OF MR. WETHERELL'S HERD.

That love of Shorthorns, which Durham so bravely fostered when the century was young, received ample illustration in the sale of this celebrated herd on Tuesday, April 19. It was quite to be expected that the skill and science of its owner would be fully acknowledged by a high average, and prophecy certainly had its fulfilment. Mr. John Wetherell, of Richmond, officiated, and did the most ample justice to the stock; though, after all, there was not throughout the day any really "slashing rally." The bidding was, in fact, rather steady than spirited. The great Cobham sale had enabled many of the Shorthorn breeders to stop the gaps which the autumn had made in their ranks; but still, not a few cast a longing eye towards some of the Aldborough plums, and the fact of the average being within two or three shillings of £73 for 48 lots proved that they quitted themselves like men when they did set foot on Durham soil. Combining the calf of Young Magic Flower and her dam in one lot, there were 35 female lots, which averaged £77 15s., while the 13 bulls reached £60 4s. It was pretty evident, soon after the leading Shorthorn men assembled at head-quarters at Darlington (where they were welcomed by Mr. Wetherell with a most sumptuous entertainment, at the King's Head) that it was not to be Statesman's day. Reports had been spread that training for shows last year had militated very severely against his efficiency, and this, added to the fact of there being only one thing (Bell Flower) by him, on the list, made many doubt whether he would even touch seventy. So much, in fact, had been said out of doors, that Mr. Wetherell felt it his imperative duty to rise in his carriage on the left of the auctioneer's waggon, and assure the company that the reports were devoid of all truth; and that the fact of so few cows having been served by him, arose from his having left home for the Chester Show, and not returning again till after the Aberdeen one.

Although a few snow-flakes fell at last, the day was most lovely, and at an early hour nearly every conveyance in Darlington was chartered for the scene of action, which lies about nine miles from that town, and is reached by a very delightful ride through Melsonby.

The Shorthorn men "stole away" very early for a peep at the lots; and when we arrived there about eleven o'clock, we found the boxes and beautiful meadow below the High Grange one busy herd-mart. A large blue bullock van, inscribed "THE CUMBERLAND OX," was for the nonce turned into a counting-house, and there the cheque and catalogue business of the sale was transacted. Farmers and holiday folk had kept gradually pouring in, and the meadow with its staked ring and waggons, and the gaudy striped Durham horticultural tent, over which the union-jack waved, lent to the whole the air of a great village festival. One celebrated turfite was so struck with the *tout ensemble*, that in the fulness of his heart he confided to us that it looked like the Derby Day, and that he felt quite odd at not having "to make up a book" on the coming events.

On the whole we should guess the assembly at about a thousand. Among them were Lord Bolton, Sir Maxwell Wallace, and the Hon. W. Duncombe; and we also observed Colonels Hedley and Gandy, and Messrs. Jaques, Neasham, Gilpin, Cradock, R. Booth, Swan, Douglas, Torr, Doig, C. Spencer, Drewry, Sanday, Aylmer, Neilson, J. Booth, T. Booth, Atkinson, Knowles, Gambell, Culshaw, H. Smith, Thompson, Carr, Mitchell, Pole, Barclay, Wilson, Thompson, James, Jackson, and several others. The most interesting feature, after all, of the attendance, was that of the octogenarians Messrs. Wiley and Charge, both of whom were purchasers at the Ketton sale, nine-and-forty years before. They thus furnished two remarkable living links with the past, as one was the fourth-part purchaser of the thousand-guinea Comet; and the other, if we remember rightly, took Midas home. Age has told its tale on the former; but the latter stood by the side of the ring for four hours, with all the energy and spirit of a boy.

About an hour before the sale, people began to find out what the long oval staked ring on the bill-side meant, as the whole eight-and-forty lots were seen, each with an attendant, winding their way in Indian file out of the farm-stead. Mr. Wetherell, on his pony, acted as field-marshal; and in a few minutes they were all

arranged in families, and drawn up in a serried line. The word of command was then given, the parade commenced, and a more masterly movement was never executed. In fact, it is one which we should like to see carried out at all sales. The pull is in favour of the seller, as the cattle show themselves so well; but at the same time, good judges have an opportunity of seeing them in action, and satisfying themselves better upon little points, than if they wandered hour after hour through their stalls, and "nipped 'em" ever so diligently. They were moving slowly round their quarter-of-a-mile course, when dinner was announced, and in a few minutes three hundred had enrolled themselves as welcome guests, and were doing full justice to a most admirable repast, to which sherry and punch lent the fullest zest. Mr. Torr, of Aylesby, was in the chair; and when he had introduced the health of Mr. Wetherell, that gentleman in a few brief and feeling sentences acknowledged the toast, and led the way to the ring.

John Ward forthwith brought lot 1, Young Jenny Lind, into the ring, as blooming as the most loyal care that ever herdsman devoted to a master's interests could make her. Independently of condition, it was evident that the cattle knew well how to make the most of themselves, and stood up as square and true as the most fastidious critic could desire.

Twenty guineas was the first bid which greeted Mr. John Wetherell's ear; but business only went on slowly, and Mr. Barclay gave forty as a closer. Cosy, a very fine nine-year-old cow, and the dam of Alderman, made the bidders look rather sharper about them; and Mr. Dreury, on behalf of the Duke of Devonshire, got her for 53 gs. Passion Flower beat her by 2 gs.; and Edith, who was frankly stated to be a very doubtful breeder, fetched only butcher's price, minus a margin. That very fine old cow, Lady Scarborough, then went for 200 gs., Mr. Pole and Mr. H. Smith being the bidders; and Mr. Gamble carried off Duchess of Northumberland (No. 6), a very striking cow, with all the Bates' quality about her, and a very fine head and prominent breast. She lingers, we are told, in Yorkshire for a few weeks, on a visit to Capt. Gunter's Sixth Duke of Oxford.

A contest then ensued between Mr. Doig, on behalf of Col. Pennant, and Mr. Dreury, for the Duke of Devonshire, over the body of the renowned Moss Rose, (who won at Kelso on March 31st), which ended in Marmaduke receiving a fresh visitor in his Welsh home. Mr. Neasham, the late owner of Usurer, (who was sold in Darlington market to a butcher about seven weeks since) next went in at 85 gs. for Young Magic Flower and her two-days-old white calf. Wallflower departed cheap to Mr. Gell for 34 gs., though the Lord Raine blood rather spoiled her; and Venus, a very good-looking cow, who was at fifty in a jiffy, with three bidders, was also sold cheap at last to Mr. Pole for 80 gs. The Master of the Bedale then gave 50 gs. for Oak Apple, whose yearling son, Baron Martin, was sold last August for 100 gs.; and some dashing biddings for Lucy, of full Booth blood, with the exception of Roland, in which Captain Spencer and Mr. Parrington both bore a part, ended in favour of Lady Pigot. Mr. Ivens got Countess cheap for 36 gs.; and then followed her three half-sisters, all got by Field Marshal, and bred by Earl Zetland. With the exception, however, of Crocus, they were slightly thick handlers; but she was a magnificent heifer. Col. Gandy, who faced the auctioneer, and bid with great spirit throughout the sale, had his own work to get her, as Mr. Dreury was at it part of the time; and there were two claimants for the 65-guinea bid. Acorn was of a bad colour, but very good; and Mr. James got her decidedly cheap. Mr. Aylmer also bought a thick well-made daughter of Whittington in Roseleaf; and

then Mr. Doig fought it out for Ayrshire Rose, but he never could shake off his antagonists until 165 gs. had been bid. She is within a few days of calving to Wisetonian. Lady Stanley followed—very clever, and with a sweet head and neck; and Miss Lumley, who did anything but discredit to the Lord Scarborough blood. Stanley Rose, who has won at Kelso already this year, then marched into the ring. Mr. Doig was again among the bidders for this justly-celebrated family, and Mr. Douglas went as high as 230 gs.; but Lady Pigot, who was on the ground with Mrs. Carr and Miss Booth, bid so boldly, through Mr. John Booth, that she was passed over to Suffolk at 300 gs. Many were the wishes that her ladyship may see her enrolled as a Royal winner. Bell Flower, the only daughter of Statesman, and as snow-white as himself, realized little more than a tenth of the sum; and then Sir Antony de Rothschild and Captain Spencer had a set-to for Governess, the only daughter of Archy Moore, and a very nice little heifer. Mr. Dreury very wisely determined that Cosy and Comfort—both of them very neat, and full of quality—should not be separated; and then Captain Spencer (who had not persevered for Governess when he saw how determined Mr. Taylor was) went in for the handsome Bloom, a beautiful combination of the Lord Mayor and Lucy blood; and she departed at 110 gs., to join Lizzy, Sappho, and Leila, the last of whom has just calved a bull-calf to Marmaduke. Lady rather brought down the average; but it is no small testimony to the value of the Lord Mayor blood that three calves by him averaged nearly 89 gs. each.

With the King Arthur roan heifer calf the first act of the sale ended; and Lord Scarborough, who is now well on in years, and has got rather heavy, opened the bull biddings, which were rather lifeless at first. Statesman, who did not look improved since last year, was as active as a kitten; and as if to show that, in spite of the endless handling he had undergone for weeks, there was no trace of temper, John Ward unbuckled his pole at once, and held him simply by his chain. Mr. John Wetherell got no offers even at fifty; but at last there came the impatient Yorkshire opening, "Go on!" from a bidder, as a halt was made; and she rose slowly to 82 gs. Mr. W. Cox, who has a small but select herd near Pickering, was the buyer, and we trust we shall see that gay elegant form with many a prize-ribbon on it yet. Sir John Crewe's agent then dipped into the Usurer blood at 55 gs. through Wisetonian, who seems likely to do as much good to Derbyshire as Alderman a son of Cosy's to Cumberland. The latter is perhaps a trifle too long for some eyes, but still he was wondrously cheap, and we believe that Mr. Wilson, with good judgment, did not intend to stop short of a hundred. Pilot was rather thick and heavy, and Lumley, a son of Lord Scarborough's, from Duchess of Northumberland No. 6, shot the average up to 125 gs. He was a very nice bull, but not of a very good colour, and we thought him dear by comparison with Statesman's brother, Stanley, who is, without exception, one of the most beautiful young bulls that ever stood the sand-glass test. Strange to say, the biddings were very laborious, so much so, that it was quite a moot point whether the sand had not run once between 80 gs. and 90 gs. However he was put up again, and Mr. Packe, who seemed to have plenty of running left, finished a clever winner for only 92 gs. Catton looked an ordinary bull; Traveller was announced to be purchased for Sir Joseph Paxton; that capital bull calf, Royal Oak, went to Farley to supply the place of his senior Bon Garçon, who died, we are told, some months since, after only a four hours' attack, of inflammation; and then the Earl of Aberdeen by Lord Mayor, who is really, as far as elegance goes, an almost *ne plus ultra* of a calf, brought down the curtain.

Some lots, belonging to Lady Pigot, Mr. Raines, and Mr. Shearman, were put up afterwards; and one of them, Female Jesuit, the property of her Ladyship, fetched 51 gs., while Venus de Medici, from Mr. Spearman's herd, was knocked down at 61 gs. To these lots a few horses and yearlings succeeded, and when we left the ground about half-past five, they were still at work, and some merry peals from the tent and roars of applause proved that the Turf was not forgotten, and that a well-known member of the Ring and owner of race-horses was on his legs returning thanks. And so the Aldborough herd was dispersed into all lands, and we cannot quit the subject without expressing a hope that its owner will not desert that cause, in the evening of his days, for which he has done so much in his prime; and that at many a show (Royal or local) to come, we may have the pleasure of recording his triumphs.

Subjoined is a return of the prices.

COWS AND HEIFERS.

(THE FIGURES REFER TO "COATES'S HERD BOOK.")

Lot 1.—YOUNG JENNY LIND II, roan, calved in 1848; got by Belshazzar (14154), dam (Jenny Lind) by Crusade (7938).—Purchased by Mr. Barclay for 40 guineas.

2.—COSY, roan, calved June 4, 1850 (Herd Book, vol. xi., p. 389); got by Cotherstone (6903), dam (Peeras) by Lord Stanley (4269).—53 gs., Duke of Devonshire.

3.—PASSION FLOWER, roan, calved in 1852; got by Whittington (12299), dam (Magic Flower) by Magician (7185).—55 gs., Col. Gandy.

4.—EDITH, white, calved in 1853; got by Snowdrop (13761), dam (Brender) (H. B., vol. xi., p. 347) by Inheritor (7104).—25 gs., Mr. Parrington.

5.—LADY SCARBRO', white, calved April 18, 1851 (H. B., vol. xi., p. 553); got by Earl of Scarbro' (9064), dam (Stately) by Statesman (13789).—200 gs., Mr. H. Smith.

6.—DUCHESS OF NORTHUMBERLAND, roan, calved May 26, 1851; got by the Earl of Scarbro' (9064), dam (Red Duchess) by Cleveland Lad II. (3408).—100 gs., Mr. Gamble.

7.—MOSS ROSE, roan, calved April 22, 1853; got by Cotherstone (6903), dam (Nancy) by Guardian (3947).—200 gs., Col. Pennant.

8.—YOUNG MAGIC FLOWER, roan, calved November 22, 1853; got by Chieftain (10048), dam (Magic Flower) by Magician (7185).—75 gs., Mr. Neesham.

9.—OAK LEAF, roan, calved July, 1852; got by Albert (8816), dam (Jenny Lind) by Norfolk (9442).—23 gs., Mr. Carr.

10.—WALLFLOWER, white, calved September 15, 1854; got by Lord Raine (13248), dam (Windsor Flower) by Earl of Scarbro' (9064).—34 gs., Mr. Gell.

11.—VENUS, dark roan, calved May 31, 1854; got by Whittington (12299), dam (Sunshine) by Twilight (9758).—80 gs., Mr. Pole.

12.—OAK APPLE, roan, calved July, 1854; got by Magician II. (10486), dam (Jenny Lind) by Norfolk (9442).—50 gs., Hon. W. Duncombe.

13.—LUCY, roan, calved August 8, 1855; got by Lieutenant (14795), dam (Alice) by Duke (9036).—150 gs., Lady Pigot.

14.—COUNTESS, roan, calved February 20, 1856; got by Field Marshal (12875), dam (Pride) by Allan-a-Dale (9887).—36 gs., Mr. Ivens.

15.—CROCUS, roan, calved April 27, 1856; got by Field Marshal (12875), dam (Syren) by Ravensworth (10689).—£3 gs., Col. Gandy.

16.—COBWEB, roan, calved August 17, 1856; got by Field Marshal (12875), dam (Andromeda) by Freebooter (11490).—31 gs., Mr. Worsey.

17.—COWSLIP, roan, calved September 1, 1856; got by Field Marshal (12875), dam (Aliment) by Allan-a-Dale (9387).—36 gs., Mr. Marley.

18.—ACORN, red and white, calved May, 1856; got by Magician II. (10486), dam (Jenny Lind) by Norfolk (9442).—52 gs., Mr. James.

19.—ROSE-LEAF, roan, calved March 11, 1856; got by Whittington (12299), dam (Lady Welbourn) by Lord Lowther (7164).—43 gs., Mr. Aylmer.

20.—AYRSHIRE ROSE, white, calved February 11, 1856; got by Whittington (12299), dam (Moss Rose, No. 7) by Cotherstone (6903).—165 gs., Col. Pennant.

21.—LADY STANLEY, roan, calved January 27, 1857; got by Earl of Derby (12810), dam (Young Jenny Lind II.) by Belshazzar (14154).—56 gs., Mr. Scott.

22.—MISS LUMLEY, roan, calved May 16, 1857; got by Lord Scarbro' (14852), dam (Deborah) by Son of Cotherstone (6903).—60 gs., Mr. Sheldon.

23.—ORANGE BLOSSOM, white, calved June 14, 1857; got by Apollo (9899), dam (Young Magic Flower, No. 8) by Chieftain (10048).—42 gs., Mr. Neesham.

24.—STANLEY ROSE, roan, calved September 27, 1857; got by Earl of Derby (12810), dam (Moss Rose, No. 7) by Cotherstone (6903).—300 gs., Lady Pigot.

25.—FAIRY QUEEN, roan, calved October 16, 1857; got by Phoenix Star (15061), dam (Elfin Queen) by The Gipsy King (11532).—30 gs., Mr. Worsey.

26.—MAID OF THE MOUNTAIN, white, calved November 27, 1857; got by Gavazzi (11503), dam (Village Maid) by Lyon Playfair (11758).—24 gs., Mr. Blakey.

27.—BELL FLOWER, white, calved April 8, 1858; got by Statesman (15342), dam (Wallflower, No. 10) by Lord Raine (13248).—38 gs., Mr. Campbell.

28.—GOVERNESS, roan, calved May 16, 1858; got by Archy Moore (14101), dam (Venus, No. 11) by Whittington (12299).—110 gs., Mr. Taylor.

29.—COMFORT, white, calved September 24, 1858; got by Lord Scarbro' (14852), dam (Cosy, No. 2) by Cotherstone (6903).—44 gs., Duke of Devonshire.

30.—BLOOM, roan, calved September 12, 1858; got by Lord Mayor (14822), dam (Lucy, No. 13) by Lieutenant (14796).—105 gs., Capt. Spencer.

31.—LADY, roan, calved September 11, 1858; got by Lord Mayor (14825), dam (Countess, No. 14) by Field Marshal (12875).—43 gs., Mr. Lascelles.

32.—PERFUME, white, calved November 3, 1858; got by Lord Scarbro' (14852), dam (Rose Leaf, No. 19) by Whittington (12299).—20 gs., Mr. Ivens.

33.—PRIMROSE, red and white, calved February, 1859; got by Wisetonian, Lot 4, dam (Cowslip, Lot 17) by Field Marshal (12857).—22 gs., Mr. Morrill.

34.—ALICE, calved March 11, 1859; got by Wisetonian (Lot 4), dam (Acorn, Lot 18) by Magician II. (10486).—18 gs., Mr. Hopper.

35.—ROAN HEIFER, calved March 12, 1859; got by King Arthur (13110), dam (Duchess of Northumberland, Lot 6) by Earl of Scarbro' (9064).—150 gs., Mr. Pole.

B U L L S.

Lot 1.—LORD SCARBRO' (14852), roan, calved October 15, 1854; got by Duke of Northumberland (12761), dam (Lady Scarbro', No. 5) by Earl of Scarbro' (9064).—40 gs., Mr. Campbell.

2.—STATESMAN (15342), white, calved November 20, 1855; got by Earl of Derby (12810), dam (Lady Scarbro', No. 5) by Earl of Scarbro' (9064).—82 gs., Mr. W. B. Cox.

3.—GENERAL HAVELOCK (14603), white, calved May 9, 1856; got by Whittington (12299), dam (Lady Brown) by Twilight (9758).—27 gs., Mr. Denchfield.

4.—WISETONIAN, roan, calved in 1857; got by Usurer (9763), dam (Sybil) by Lord Warden (7167).—55 gs., Sir J. Crewe.

5.—ALDERMAN, roan, calved April 23, 1857; got by Earl of Derby (12810), dam (Cosy, No. 2) by Cotherstone (6903).—70 gs., Mr. Wilson.

8.—PILOT, red and white, calved September 25, 1857; got by Magician II. (10486), dam (Oak Leaf, No. 9) by Albert (8816).—22 gs., Mr. Denchfield.

9.—PRINCE WILLIAM, roan, calved February 20, 1858; got by Prince of Orange (15101), dam (Young Jenny Lind II., No. 1) by Belshazzar II. (14154).—23 gs., Mons. Von Volsen.

10.—LUMLEY, red and white, calved March 6, 1858; got by Lord Scarbro', Lot 1 (14852), dam (Duchess of Northumberland, No. 6) by Earl of Scarbro' (9064).—125 gs., Mr. Surtees.

11.—STANLEY (own brother to Statesman, Lot 2, 15342), roan, calved March 6, 1858; got by Earl of Derby (12810), dam (Lady Scarbro', No. 5) by Earl of Scarbro' (9064).—92 gs., Mr. Packe.

12.—CATTON, white, calved March 26, 1858; got by Lord Scarbro', Lot 1 (14852), dam (Young Magic Flower, No. 8) by Chieftain (10048).—21 gs., Mr. Peacock.

13.—TRAVELLER, roan, calved May, 1858; got by Lord Scarbro' (14852, Lot 1), dam (Passion Flower, No. 3) by Whittington (12299).—27 gs., Sir J. Paxton.

14.—ROYAL OAK, roan, calved August 19, 1858; got by Lord Mayor (14828), dam (Oak Apple, No. 12) by Magician 2nd (10486).—70 gs., Mr. Fawkes.

15.—LORD ABERDEEN, roan, calved September 17, 1858; got by Lord Mayor (14828), dam (Moss Rose, No. 7) by Cotherstone (6903).—91 gs., Mr. Pole.

CALENDAR OF AGRICULTURE.

The planting of beetroot must be done in the first ten days of the month; and of potatoes, if remaining from last month. Sow grass seeds; and hoe all drilled crops. Sow Swedish turnips—purple and yellow-topped, and continue with Aberdeen yellow bullocks as a later sowing. Plant cabbages, kohlrabi, savoy, and winter broccoli. Sow rape, to be consumed on the ground preparatory for wheat; and sow early white turnips, for use in autumn.

Pare and burn lands constantly during this month; and prepare turnip and clay fallows.

All dung-heaps must be turned over for ten days before being used, that a fermentation may take place: all lumps and large pieces must be carefully broken and shaken out. Watered meadows may now be shut-up for hay. Gates and fences must be thoroughly repaired for summer use.

Cattle of all ages will now go to grass—the milch cows in a well-watered and sheltered field, and the store cattle in the pasture fields, arranged according to age. A proper arrangement conduces much to well-being and thriving. The calves of the year must be similarly arranged—the oldest in a grass paddock provided with water and a shed for shelter, and have one suckling daily, and be supplied with clovers and vetches in racks. Spare

neither pains nor expense on young animals. The young calves in the pens should have green food given them, in order to introduce such meat previous to being turned out.

The lambing ewes must be supplied with oats and oilcake in troughs, until the early vetches and rye are ready. The food may be cut, and given them in racks; and part must be carried home for soiling cattle, horses, pigs, and calves in the yards. Litter amply. As the land is cleared, plough it for a turnip fallow.

Hop grounds may be dug this month, and the bines tied to the poles; young hedges weeded; oak trees cut, and the bark stripped and dried.

Wash sheep by hand in a running stream a week or two before shearing commences, to prevent the maggot-fly depositing their eggs on the animals. Sprinkle them from head to tail, from a dredging box, with a mixture of hellebore-root powder and black brimstone— $\frac{1}{4}$ to $\frac{1}{2}$ lb.

No month in the year brings more business to the farmer than the present; and if ground be lost now, it will rarely be recovered during the season. The preparation of the turnip and clay fallows is in the critical season: the first crops must be planted, and the rest prepared for, with the utmost activity and exertion.

CALENDAR OF GARDENING.

KITCHEN GARDEN.

Kidney Beans: Scarlet and painted-lady runners are first called for: a warm soil is required; the seed perishes in cold, wet ground, and the plant does not advance well in a dry, arid soil: best sown in pots; and dwarf French beans require a similar treatment: the season and weather are the best directors. It is good policy to have a stock of beans in pots in early April; and to trust to open-ground sowings in summer.

Peas: Knight's marrow, and Adamson's matchless Dorset variety, are most suitable for henceforward plantings. Sow the peas an inch asunder, in quincunx order, on trenched grounds, with rotten manure, and well-watered by the rose-pan: this precaution is to prevent mildew. Late crops of peas, sown six weeks hence, may be got at Michaelmas.

Potatoes: The late crops should be set, if not yet plants. Let the rows, if possible, range north and south, to admit an equable diffusion of sunlight.

FRUIT DEPARTMENT.

Disbud all fruit-trees of all side shoots as have no fruit at the base, excepting one near the origin, which is left for a successor to the bearing shoot of the present year. Fill up blanks by well-adapted shoots, which improve old trees.

FLOWER GARDEN.

Plant flowers in the parterre system in the end of the month, to escape frosts: plots and groups in masses, with room for growth, and no suffocation by crowding. Pelargoniums and verbenas, and the allied elegant plants, are thus displayed; and in the arrangement, taste must guide.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR
APRIL.

Although easterly winds have prevailed during a portion of the month, the weather, on the whole, has been seasonably fine. The fine rains which fell from the 22nd to the 25th have been highly beneficial to vegetation, and more especially to the pastures, which, at this time, present a favourable appearance for a full average grass crop. As regards the now rapidly growing wheats, we may observe that they are looking remarkably healthy, with scarcely an exception; consequently we have every reason to anticipate, so far, a full average forthcoming yield of wheat.

The prospect of an immediate outbreak of hostilities between Austria, France, and Sardinia, has had considerable influence upon the wheat trade. Since we last wrote, both English and foreign wheat has improved in value from 4s. to 6s. per quarter, and there is every probability of further enhanced rates, even though the stocks on hand are large for the time of year. A continental war will, no doubt, lead to a considerable falling off in the imports of foreign produce into this country, and to large speculative operations, under the impression that *high* prices may result from hostilities between the powers just alluded to. Again, we must bear in mind that America has very little grain to spare for export purposes, and that the value of produce throughout the Union is still high. Whilst admitting that there is ample room for an improvement in the value of wheat, the question is, do we require a *heavy* importation this year to meet consumption? Our impression is that we do not, because it is admitted on all hands that our farmers still hold large quantities of wheat, and because immediate shipments of grain to some extent would result from warlike operations, though they might not be continued. Our farmers require not unnecessary excitement in the trade, but steady and remunerative prices. A sudden advance of 10s. per quarter would, possibly, lead to a re-action in the trade; but a moderate improvement, such as we have lately experienced, may have the effect of producing a further rise, and that, too, of a legitimate character. In reference to spring corn, we may observe that, as we draw the bulk of our supplies from countries which are not likely to be involved in the pending struggle, the importations are likely to continue on a fair average scale. Prices, however, will, we think, be maintained, and it is possible that barley may continue to rise in value. Some few sales of English wheat have been made in Mark Lane for export to Portugal, but this demand is not likely to exercise any great influence upon the quotations, though, of course, it will tend to give firmness to them.

Owing to the small commercial operations for export to the continent, and the comparative heaviness in the woollen trade, all kinds of wool have ruled very inactive during the greater portion of the month, and, in some instances, prices have had a drooping tendency. The next public sales of colonial wool in London, which have been postponed till the 5th of May, are looked forward to with more than usual interest. At present, there is nothing indicative of an advance in prices, more especially as great efforts continue to

be made on the continent to lessen the influence which these sales have long since exercised upon the wool trade of the world. The quantity of foreign and colonial wool now in London is about 60,000 bales, the whole of which will shortly be brought to the hammer. The paucity of the demand has led to increased stocks in the hands of our flockmasters, so that there is no reason to apprehend any deficiency of supply, even though the advices at hand from Australia and South America indicate only moderate shipments. Any falling off in the supply from those quarters will, we imagine, be fully made good by the Cape farmers, who are now shipping increased quantities to England. During March, 24,223 bales of colonial, and 834 bales of foreign wool arrived in the port of London. The supplies of the latter into Liverpool were 12,026, into Hull 457, and into Leith 344 bales.

Judging from the enormous quantities of potatoes which continue to arrive in London from Scotland and various parts of England, it is evident that last year's crop was very abundant, and of full average quality. The excess in the supplies during the winter months, the low prices at which they have been selling, and the enormous quantities of rice offering at unusually low figures, no doubt interfered materially with the value of wheat, which, in our opinion, even allowing for seasonably large stocks, had a depressing influence upon the value of wheat. But, on the other hand, we have been told that the consumption of bread has fallen off, not only in the metropolis, but in the provincial districts. We, however, have no faith in such a statement, because it is admitted that trade, generally, is in a sound, though not to say brisk, state, and that our artisans and others continue to be well and fully employed. It may be that increased wages have led to an extended consumption of butchers' meat; but we think that, eventually, it will be found that more bread is now being consumed in the United Kingdom than is generally imagined. The late extensive system of feeding cattle with inferior wheats—a system, by the way, which has paid remarkably well, from its having been found much cheaper than oil-cake—will, we apprehend, be partly, perhaps wholly, discontinued, now that prices are advancing. Upon inferior samples, for feeding purposes, great inroads have been made from time to time, and such qualities will, as a consequence, speedily rise to a higher level in value than either linseed or rape-cake.

Some extensive fluctuations have taken place in the value of live stock in the whole of our leading markets, but more particularly in London. Up to the 25th of the month, both beasts and sheep were selling at very high rates, owing to deficient supplies of home-fed stock, and to the stringency in the Government inspection of the beasts and sheep arriving from the continent. This stringency has been strongly opposed by those immediately interested, and upon this point much might be said. Here, however, we shall merely observe that it is the duty of Government to prevent the introduction of diseased animals into this country, and, to secure that end, they ought to appoint *competent judges* of stock. Those judges should be free from bias as respects any particular interest, and should have full power to deal with the importations as they arrive. It is well known that disease exists to a great extent throughout Holland and Denmark, and to allow

its introduction here would be productive of the most disastrous consequences to the interests of our breeders and feeders.

Both in Ireland and Scotland the wheat trade has assumed more firmness, and prices have steadily advanced. Barley and oats of fine quality have changed hands steadily, at extreme rates, but other articles have met a dull inquiry. The shipments of produce from Ireland have continued on a very moderate scale; but those from Scotland have been liberal. This latter fact tends to confirm the impression, pretty general in some quarters, that rather large quantities of grain are still in stack in the Lothians. Unless we are greatly misinformed, however, the supplies on hand in Ireland are very moderate for the time of year, even though steady importations have been reported during several mouths past from the westward.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

In the early part of the month, only limited supplies of beasts and moderate numbers of sheep were on offer in the Great Metropolitan Cattle Market. The demand for all breeds, therefore, ruled somewhat active, and prices were steadily on the advance. On the 25th, however, owing to increased arrivals, and to an improvement in the general weight and condition of the stock, especially from Norfolk, the trade became heavy, and the quotations gave way 2d. to 4d. per 8lbs. The lamb trade has been in a depressed state, at comparatively low figures; indeed, we seldom recollect a worse demand for lamb than on Good Friday, a day generally looked forward to as producing the highest value for lambs during the whole of the season. Hitherto, the lambs have come to hand in good condition, and the fall in most parts of England appears to have been a full average one.

The continued high value of skins, hides, and tallow in the provinces, has led to full average supplies of country-killed meat being received up to Newgate and Leadenhall; nevertheless, sales have progressed steadily, and fair quotations have been realized.

Some wonderfully fine bullock-crosses have appeared in London, viz., Scots crossed with Shorthorns. Many of the heifers have weighed fully 115 stones, and most of them were forwarded from Aberdeen and Morayshire. Here we may remark that very few really pure Scots now make their appearance in London either from Scotland or Norfolk; but though the new system of crossing has turned out remarkably well, and though the first crosses have produced some very fine animals, it may be well doubted whether what is termed the "in and in" system is either a safe or profitable one to the graziers.

The health of the stock in our leading counties has continued remarkably good. The losses from disease have not increased, and the supplies of winter food have not yet been exhausted.

From abroad, the imports of beasts have been very moderate; of sheep, tolerably extensive; but most of the latter have been composed of merinoes of very light weight, produced in Germany. The arrival of calves has fallen off, when compared with some former years, and, taken collectively, the general quality of the supplies has declined. The following numbers have been reported into London:—

Beasts	742 head.
Sheep	7,748 "
Lambs	9 "
Calves	335 "
Pigs	4 "
Total	8,888 "

Same time in 1858	5,998 he
" 1857	4,814 "
" 1856	1,924 "
" 1855	4,253 "
" 1854	4,760 "
" 1853	14,787 "
" 1852	5,444 "

The total supplies of home-fed and foreign stock exhibited in the Metropolitan Market have been as under:—

Beasts	16,850 head.
Cows	390 "
Sheep and lambs	110,114 "
Calves	420 "
Pigs	1,990 "

COMPARISON OF SUPPLIES.

April.	Beasts.	Cows.	Sheep & Lambs.	Calves.	Pigs.
1858....	17,950	400	104,380	1,332	2,097
1857....	18,601	460	92,810	1,240	2,025

In the month just concluded, 11,400 Scots, Shorthorns and Crosses came to hand from Norfolk, Suffolk, Essex, and Cambridgeshire; 1,270 various breeds from other parts of England; 1,280 Scots and Crosses from Scotland; and 430 oxen and heifers from Ireland.

Beef has sold at from 3s. 4d. to 5s. 2d.; mutton, in the wool, 3s. 10d. to 6s.; lamb, 5s. 4d. to 7s.; veal, 3s. 10d. to 5s. 8d.; and pork, 3s. to 4s. 2d. per 8lbs. to sink the offal.

COMPARISON OF PRICES.

	Apr., 1856.				Apr., 1857.				Apr., 1858.				
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	
Beef .. from	3	2	to	4	10	..	3	4	to	5	0	..	2
Mutton ..	3	6	..	5	8	..	4	6	..	6	2	..	3
Lamb	6	0	..	7	4	..	5	10	..	7	4	..	6
Veal	4	0	..	5	8	..	3	8	..	5	10	..	4
Pork.....	3	6	..	4	8	..	3	8	..	5	0	..	3

Judging from the advices which have come to hand from Holland, only moderate supplies of stock can be expected to arrive from that country during the next three or four months; but we may look forward to steady imports of sheep from Germany during that period, as the numbers on hand appear to have considerably increased of late. The sheep from Germany, however, require crossing with English breeds, to make them profitable to the shippers. At present, the profit upon each head, after the payment of expenses, must be very small; and this will be apparent when we state that the German sheep are worth only from about 20s. to 27s. per head in our markets. With a fair outlay for breeding stock, Germany is able to produce much better sheep than those which we have received since the passing of the new Tariff, and which, in point of fact, have undergone little or no change, either in point of weight, general condition, or quality.

Newgate and Leadenhall have been tolerably well, but not to say extensively, supplied with each kind of meat; and, on the whole, the demand generally may be considered healthy. Beef has sold at from 3s. 4d. to 4s. 8d.; mutton, 3s. 6d. to 4s. 10d.; lamb, 4s. 4d. to 6s. 4d.; veal, 4s. 2d. to 5s. 4d.; pork, 3s. 2d. to 4s. 2d. per 8lbs. by the carcass.

WEALD OF KENT.

The first quarter of the present year was all that could be desired for the progress of farming operations. The wheat plant is looking well for the most part. The breadth of spring corn sown is beyond an average, owing principally to the low price of wheat. Grass and seeds grow but slowly, being impeded by the frosty nights. Stock of all kinds is in fair condition; fat stock is dear. Sheep realize high figures. The fall of lambs, "which is nearly over," has been attended with success, but with fewer couples than last year. The corn market, till within the last week or two, has been very inactive, and prices have not been remunerative for wheat. A large county meeting was held on Penenden Heath on Thursday last, which was numerously attended, with a view of obtaining the remission of the in-

statement of hop duty payable in May next; also to get a repeal of a portion of that tax by reducing the same to one penny per pound. "This no doubt will be acceded to, should the present government be supported, and would be hailed as a very great boon by all concerned in their

cultivation. The farmers and hop growers of West Kent have now a chance at the coming election; and by returning Lord Homedesdale and Sir Edmund Filmer, "who have pledged themselves supporters of such a measure," they will be fairly represented in the new parliament.—April 20.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

BALCOMBE FAIR.—There were some very good specimens of Sussex stock, especially two steers, two years old, by Mr. John Beeching, that realized £30. He had also a fat cow, sold to Mr. Babe for £20, that was much admired, and surpassed by none in the fair. Mr. W. Tester had seven Sussex steers, two years, very complete, that fetched £100 in one lot. The show of sheep was by no means large, but tegs sold well and freely at from 28s. to 30s. per head. Nothing very first-rate were, however, offered. Pigs were not in any great numbers, but sold at somewhat extravagant prices, home-bred quarter-olds fetching from 20s. to 22s. per head. A fine pen of good Berkshire pigs, quarter-old, realized 18s. each, which as they are not considered so prime as home-breds was certainly a long price. There was a very decent show of horses, but business was not so brisk as in other kinds of stock, and the exchanges were few.

BANBURY FAIR.—There was a moderate supply of both beasts and sheep, but not much either beef or mutton of first-class quality. Beef fetched from about 4s. to 4s. 10d. per 8 lbs., and mutton from 5s. to 5s. 6d. upon the average. There were several fine bulls, which sold at fair prices.

BISHOPSTOKE FAIR.—There was an average quantity pitched; and, the attendance of buyers being large, the principal portion changed hands, at about the following rates: half cows, 54s. to 58s.; doubles, 58s. to 62s.; Somersets, 64s. to 70s.; Cheddar, 72s. to 76s.

BODMIN FAIR.—The following were successful in obtaining the premiums: Mr. W. Rouse, of Lancoffe, Bodmin, obtained the prize for the best fat ox. The second-best was won by Mr. J. Runnalls, of Trengoffe, Warleggan, and the third was awarded to Mr. T. Baron, of Lidcut, Bodmin. The prizes for the best cows were given as follows: The best prize to Mr. Billing, of Penrose, St. Tudy; the second-best Mr. W. Rouse, Lancoffe, and the third best to Mr. J. Runnalls, of Trengoffe. The fair was not a particularly large one, and the umpires appeared to have no great difficulty in awarding the prizes, except between the second and third-best ox, and the second and third prize cow. Fat cattle sold during the day at about three guineas per cwt.; store cattle met a ready sale at advanced prices.

CAISTOR FAIR.—There was a very excellent show of sheep, and plenty of buyers. Mr. Carr, of Nettleton, obtained 66s. per head for a lot of prime hogs.

CHESTER FAIR.—The supply of cattle was large, particularly of milking stock, the prices of which were rather higher at the opening of the fair, but declined again as time went on. Sheep and pigs were an average supply, mutton making 8d. per lb. to 9d., and pork 5d. In the horse fair the show of animals was very inferior. Good harness horses and hacks were in demand; but first-class buyers, like that description of horses, were very few and far between.

CLENT FAIR was well attended; there was a good show of all kinds of stock, most of which was sold.

CROWLE FORTNIGHTLY MARKET.—There were few strangers present, and little business appeared to be transacted in the sale and purchase of cattle. Pigs continue to maintain high prices.

DEFYNNOC FAIR.—The quantity of stock was very large, and there was generally a ready sale, the attendance of dealers being very large, with a remarkably brisk demand for barrens and steers. Cows and calves were not much inquired for; and the horse fair was rather dull. The prices realized were fully equal to recent rates.

DEVIZES FAIR.—There was above an average supply of sheep, of which but few were sold, owing to the high prices asked, and the cold unpromising weather. 48s. were asked for couples, but 45s. was the highest price we heard that was

given; tegs sold at from 30s. to 45s. each. Cattle were rather below an average supply; they sold well at full prices, and quite equal to late fairs. Cows and calves at from 10l. to 17l. Oxen and steers at 18l. to 20l. each. There were some good cart-horses, and they sold well, the best as high as 45l. each.

ELGIN CATTLE MARKET.—There was a very full market of cattle, the largest that has been seen for some years, and there were a great number of buyers from the south. Business was rather dull the first part of the day, owing to the high prices asked. Towards the afternoon, however, sellers gave way a little, and a great many transactions took place. Mr. Cruickshank, Cloves, sold a lot of three-year-old stots, 28l. per head; Mr. Clunas, New Elgin, a lot of do., 19l.; Mr. Macbean, Nairnside, a lot of do., 18l. 10s.; Mr. Forthart, Newton, a lot of do., 18l. 12s. 6d.; Mr. Adams, Sweethillock, a lot of do., 14l. 7s. 6d.; Mr. Millar, Fosterseat, a lot mixed, 14l. 10s.; Mr. John Grant, Pitgavenny, a lot of two-year-old, 14l. 14s.; Mr. Cruickshank, Plewlands, a lot of two-year-old crosses, reared by Mr. Grant, Pitgavenny, 18l.; Mr. Gordon, New Market, one lot of two-year-olds, 11l.; a lot of queys three-year-olds, 13l. 15s. There was a poor horse market, and no demand.

GLOUCESTER MONTHLY MARKET was the smallest we have witnessed this year. The number of fat sheep was exceedingly limited, and an advance in price was readily obtained. There were very few beasts, and those of an inferior quality, but the trade was brisk at the following prices: Beef 7d., mutton 8d. to 9d. per lb.

GRANTHAM FAIR.—There was a good supply of stock, particularly of sheep, which sold exceedingly well. Hogs averaged about £2. One lot of a hundred fetched 57s. 6d. We heard of another lot, bought after Michaelmas at 20s. 6d., selling at 45s. Fat sheep fetched 8d. per lb. in the wool. Store beasts sold well.

HAY FAIR.—The supply of stock small and buyers few, which may be accounted for by the fact of Talgarth and other fairs in the neighbourhood falling on the same day. Fat sheep remained on hand, purchasers (principally butchers) declining to offer. Barrens realized fair prices, from £10 to £14; good cart horses fetched from £30 to £40 each.

KIDDERMINSTER FAIR.—There was a good supply of fat stock, and business brisk. Cows sold at from 7d. to 7½d. per lb.; sheep (shorn) 7d. to 7½d., in the wool, 7½d. to 8½d. Cows and calves maintained their former price, and pigs about 8s. a score.

LISKEARD FAIR was well supplied with cattle, which sold remarkably well, and almost a complete clearance was effected. Fat bullocks from 56s. to 60s., cows and calves 50s. to 55s., and store cattle 45s. per cwt.; sheep 7d. per lb.

LUDLOW FAIR.—A moderate supply of live stock was exhibited, most of which were sold at extreme prices.

LOCKERBY FAIR.—The number of sheep was about 2,000 head, of which about 1,000 were half-bred hogs, 850 Cheviot hogs, and 160 crosses. Nearly two-thirds of the Cheviots were ewe hogga. There was a considerable attendance of buyers, and grass being abundant there was a good demand for sheep; but very high prices being asked the market during the forenoon was slow, though by two o'clock most of the lots had been disposed of; still a few lots for which the owners would not accept the prices offered were returned to their pastures. A lot of half-breds from Annanbank were purchased for Shillahill at 42s. with a luckpenny; a lot of 200 brought about 36s.; the best lots ranged from that figure to 49s., but most of the lots ranged from 30s. to 36s.; for a lot of Cheviot wedder hogga belonging to Mr. Little, Applegarth, 40s. was asked, but they were not sold at that figure; they were a very superior lot; a lot of 60, made 32s., and another

lot of 60, 31s.; a lot of 50 sold for 29s. 3d., prices ranging for wedder hogs down to 20s.; a lot of ewe hogs made 25s. 9d., and various lots sold from 22s. to 24s., prices ranging to 18s. The quality of the Cheviots generally was much superior to those of last year. A lot of 100 cross hogs, from Burnt-shields, Tinwald, sold for 31s. 6d., and a lot of 50 made 31s. The market on the whole may be considered slow and dear. There was a considerable show of cattle, Gallowaya and Ayrshires. There was an excellent demand for grazing beasts at high prices; and anything good among the Ayrshire cows and queys was readily sold at high figures.

LYMINGTON FORTNIGHTLY MARKET was well attended. There was a good show of horses, cattle, sheep, and pigs. The demand was brisk, at full prices.

MALTON FAIR.—A most numerously attended fair; but the show of cattle was limited, and nearly confined to grazing beasts, which has given firmness to prices. Owing to the eagerness with which horses were bought on Monday and Tuesday, they were scarcer to-day. The attendance of buyers was numerous, but few horses changed hands. Entire horses were plentiful.

MANSFIELD FAIR was but thinly attended, and the principal of the stock shown was of an inferior kind. Thirty fine beasts (bred and fed by His Grace the Duke of Portland) fetched £30 per head. But very few horses were in the fair. Trade in sheep was not very brisk, many leaving unsold. A few young beasts sold well.

NORWICH TOMBLAND FAIR.—At this great and important fair there was a falling off in the show of Scots, but of shorthorns the numbers were both large and good. The attendance of buyers was tolerably numerous, which caused sales to be brisk for Scots at 4s. to 4s. 6d.; fresh in condition, 5s.; shorthorns, 3s. 6d. to 4s.; prime, 4s. 6d. per stone of 14 lbs. when fat. At the close few remained unsold. Fat beasts a small show; sales firm at from 7s. 6d. to 8s. 8d. per stone, and all sold. The pens well filled. Hoggets an immense show, many thousands being of superior condition and quality. The principal buyers were from Cambridgeshire, Lincolnshire, and the neighbouring districts. The very high prices asked in the early part of the day checked business; but after twelve o'clock sales were good at the following prices, the best making 60s. to 66s.; big and full in condition, 50s. to 54s.; strong and useful, 42s. to 45s.; middling, 36s. to 40s.; poor and ordinary, 25s. to 30s. per head. At the close of the market a small portion remained unsold. We may remark, although the price is generally very high, still we fear the result of this day's sales were not in favour of the dealers; whilst, on the other hand, the breeders are well paid. Good keeping sheep from 40s. to 42s. per head. Fat sheep 8s. to 8s. 6d. per stone, and all sold. In the horse fair there was a large number exhibited, comprising draught and hackneys, varying from £20 to £25, £30 to £35 per head. Very prime animals scarce, and difficult to purchase at from £80 to £100 each.

SHIPSTON-ON-STOUR FAIR brought a large attendance of buyers from distant counties, which tended to give a briskness to the trade, and although there were not so many fat horses as usual, those of first-class quality ranged at high prices, varying from £40 to £70; a good trade also was done with second-rate horses, which realized good prices. Of beef and mutton there was a moderate supply, with a great demand and high prices; beef realized 7d.; mutton, shorn 6½d. to 7d.

STAMFORD FAIR.—In consequence of the Midlent stock fair being held so recently there was not much animation in the cattle trade; for the same reason there was not a large show of any kind of stock. For beasts very high prices were asked, and as sellers appeared to be unwilling to give way, very few transactions took place: for two-year-old store steers from £12 to £14 were demanded; the prices for drapes were high, very poor animals indeed making £11 each; fresh ones were sold at £15; a few fat beasts were offered, and made about 8s. 6d. per stone. The show of sheep was not large, and the trade was dull; several pens were unsold in the afternoon: prices not so good as at Midlent fair.

TALGARTH FAIR was a small one; sales of nearly all kinds of stock were readily made at a slight advance upon previous rates. Barrens, feeding steers, and good horses seemed to be most in request, and of these the chief part exhibited were sold.

TENBURY FAIR was a good one, there being a capital supply of cattle and sheep, which met a fair demand. Pigs were not so plentiful as on former occasions of the kind, but very dear.

TEWKESBURY FAIR was well attended by farmers and dealers, and was the largest fair held for some time past. Beef sold from 6½d. to 7d., mutton 7d. to 9d. per lb.

TOWYN FAIR.—The supply was small. Bullocks and steers realized about the same prices as at our last March fair. Pigs were much higher, stores realizing good prices. Horses were scarce, the supply not being equal to the demand.

WIMBORNE FAIR.—There was a large attendance of farmers. The stock was not very numerous, but most of it changed hands.

WORKSOP FAIR.—Owing to the unfavourableness of the day there was but a thin attendance. There were very few sheep and beasts, and the show of horses was meagre in the extreme.

WORCESTER FAIR was well supplied with stock of all description, notwithstanding several other large fairs were held the same day. There was a good attendance of buyers. The best qualities of fat beef fetched about 7½d. per lb. Stock beasts sold well. Fat beasts sold briskly, at 7½d. per lb. shorn, and 9d. in the wool; ewes fetched 7d. per lb.: a few pens of fat lambs were sold, one of which made 36s. each, and the lowest fetched 30s. each. There were but few fat pigs, but a larger number of stores than usual, which sold at slightly advanced prices. The horse fair was thinly supplied.

BELFAST, (Thursday last.)—Butter: Shipping price, 105s. to 112s. per cwt.; firkins and crocks 11½d. to 12d. per lb. Bacon, 51s. to 56s.; Hams, prime 72s. to 80s., second quality 60s. to 65s. per cwt. Prime mess Pork, 78s. to 80s. per brl.; Beef 120s. to 130s. per tierce refined; Irish Lard, in bladders 66s. to 70s.; kegs or firkins, 60s. to 61s. per cwt. Pork, 47s. to 51s. per 120 lbs.

CARMARTHEN BUTTER MARKET, (Saturday last.)—The market opened with a very small supply, and the quality generally by no means satisfactory. For choice qualities farmers realized, under an active demand, from 13½d. to 14d., ordinary sorts 12½d. to 13d., old butter about 1s. per lb. The weather is cold and ungenial, but dry, and favourable for the completion of the seeding season. Under the influence of the actual commencement of hostilities upon the Continent, our corn market is advancing, and farmers withholding supplies.

GLASGOW CHEESE MARKET.—Trade quiet, and few coming forward. Only three carts were shown in the bazaar, and five tons passed the weigh-house scales. Prices steady. Prime early made, 63s.; late made, 49s. to 54s. per cwt.

RUGBY CHEESE FAIR.—The supply was about an average; the demand, however, was very sluggish. Farmers had to reduce their prices before sales could be effected. Many of the buyers south and west of Rugby left the fair without making purchases, the prices in the West of England offering them more inducement. Prices may be quoted as follows:—Skims 32s. to 35s., two-meal 38s. to 44s., new milk, small 51s. to 60s., good useful cheese 62s. to 65s., finest large dairies 65s. to 70s., two extraordinary fine dairies, 3's to the cwt., realized 72s. to 73s. Several lots were taken home again unsold.

APPOINTMENT OF PROFESSOR SPOONER AS AN EXAMINER OF HORSES AT THE MEETINGS OF THE ROYAL AGRICULTURAL SOCIETY.—It is with great pleasure we announce that the Council of the Royal Agricultural Society of England have unanimously appointed Professor Spooner the Examiner of Horses at their Annual Meetings. The labour of inspecting all the animals, and reporting thereon to the stewards, had fallen somewhat heavily on Professor Simonds; for although he was not without assistance, yet the responsibility rested entirely on him; but now that this division is made, each professor will be enabled to give his individual energies and talents to the performance of the duties of his respective office; and should an emergency arise, or any doubtful case present itself, by co-operation the difficulty will be surmounted. Thus will be secured the object the Society has always had in view, while at the same time the public will have full confidence in the correctness of the decisions which may be come to.—*The Veterinarian.*

REVIEW OF THE CORN TRADE DURING THE PAST MONTH.

March closed with a heavy snow-storm and most unusual severity, and the close of the first week in April brought in the temperature of mid-summer, a difference of from 20 to 76 degrees being experienced in one week. Since then there has been a return to frosty nights and cold winds, and finally an abundant fall of rain, and mild atmosphere. These extraordinary changes have greatly damaged the wall-fruit and pears, but generally vegetation has borne the fluctuations well, and the corn has appeared uninjured; in fact, the growing wheat is almost too forward and rank, as the consequence of the previously mild weather. The apprehensions of drought have now greatly diminished, but the fall of rain is yet considerably in arrears, as is still testified by the lowness of the reservoirs and wells. The long continued dulness in the wheat trade has at last given place to an active trade, the higher prices paid in Portugal, Spain, Algeria, Egypt, and America having gradually brought on a foreign demand, which, though moderate in its character, somewhat increased the value; but the late warlike rumours in Europe, pointing with an almost certainty to this dire calamity, have greatly accelerated the upward movement, and this grain in the course of the month has advanced 4s. to 5s. per qr., with less disposition on the part of holders to quit their stocks. The effect of the superabundance of 1857 indeed now appears to be gradually subsiding, the low prices thence ensuing having caused a very lavish use for cattle feed beyond the consumption of a growing population, while the quotations in Northern Europe, and even Odessa, left no margin for profitable shipments to Great Britain. It is true there have been steady imports for a long period; but very few of them have so much as realized cost price, while many have been to a sadly losing account. Negotiations seem yet possible in the political horizon; but even with peace in prospect, we do not apprehend a serious decline, while with an European war at all protracted there might be a considerable enhancement. The condition also of the English wheat being generally improved, will make it more fit both for the mill and speculative purposes; while foreign stocks are by no means heavy, and some holders have already entirely withdrawn their samples from market, in expectation of better prices. Hitherto the crops in Germany, Russia, Holland, Belgium,

France, Algeria, and the Principalities of Wallachia and Moldavia have been well reported; but it has been otherwise in Southern Europe, as Spain, Portugal, and Sicily have been threatened with drought. Free imports are, therefore, again permitted in the two latter countries, and the same permission is shortly expected in Spain, the price of flour at Marseilles being already improved by the expectation. In America, too, the absence of snow is said to have been very injurious to the wheat plant, and a deficiency in the general yield may be the consequence. Stocks all over the world appear but small, and it is very probable that British farmers hold more than is stored in foreign parts. The effect of the late rise in this country is yet to be seen abroad; but the prices in several places, before it was known, were as follows:—The cheapest markets were those of France, fine wheat being yet only quoted at about 40s. at Paris; but at the shipping port of Nantes the market had risen by the Portuguese demand, and rates were uncertain, several shillings being asked over former rates, 36s. and 37s. At Antwerp the quotation for native white was 43s. 6d. Louvain was moving up, with 45s. asked for fine red; and all the Belgian markets began to be influenced by warlike rumours. At Amsterdam fine Polish wheat obtained 55s. Mecklenburg red at Hamburg was held at 47s., and 62lbs. Rostock quoted 44s. 6d. At Berlin and Konigsberg top prices remained 49s. At Dantzic nothing fine could be had under 52s. per qr. Odessa was tending upwards, and a large business in wheat transacted, the best Polish making 42s. per qr. At Alexandria stocks were scarce, and the low Saide wheat was bought by Government at 29s. 6d., the identical price it had been bringing off the coast here. Trieste was short in stock, and fine Banat and Romagna wheat was worth 46s. 6d. In Algeria native hard wheat had brought 57s. 6d. from its scarcity, and the smallness of stocks was felt all along the coast. At Lisbon, soft wheat was worth 55s., and hard Seville wheat at Barcelona had brought 60s. to 70s. Many districts in North America were very destitute, and New York prices had occasioned some shipments hence as well as from France, red southern and Tennessee being worth 50s. per qr. of 480lbs, and white Kentucky 65s.; but the last accounts were dull at these rates.

The first Monday in London opened on moderate supplies, both of English and foreign wheat, the latter being about half French. The near counties only sent up about the usual supplies, but the return of warm forcing weather influenced the market unfavourably, sales being only slowly made at the previous quotations, and the business in foreign was but retail. The country markets held subsequently were generally firmer than that of London, but Birmingham, Gainsborough, and Stockton-on-Tees were more decidedly dull, with some downward tendency. Liverpool found a demand for Portugal at 9s. 1d. per cental, but the last market there was rather in buyers' favour.

The second Monday was better supplied with English wheat, and less from abroad. Kent and Essex sent up a fair show of samples, the condition of which was improved. Warlike rumours prevailing, prices were influenced fully 1s. upwards on the samples sold; but generally a larger advance was insisted on, which checked business. More transactions passed in foreign, at fully 1s. per qr. improvement. Some markets in the country on receipt of these advices were not improved, but more generally there was 1s. advance, Boston, Newark, and Sheffield being 1s. to 2s. up; while Norwich, Spalding, and several other places were quite 2s. per qr. dearer. At Liverpool, on Tuesday, some fine red was sold for Portugal at equal to 48s. per qr. of 480lbs., in bond, other sales being effected at unaltered prices, while Friday's business was only firm.

The third Monday had less English and more foreign wheat, the quantity from France again preponderating. From Essex in the course of the morning there were but few samples, and from Kent only a moderate show. Orders from Portugal being in hand for red qualities, those of good quality brought 1s. to 2s. per qr. more money, and the value of white was somewhat improved at the end of the market, by the clearance of the red samples. Notwithstanding the occurrence of Good Friday this week, the country markets all gave a ready response to the reports from town. Birmingham and Spalding were 1s. dearer; Hull, Lynn, Bristol, and Newcastle reported a brisk trade, at 1s. to 2s. more money; Ipswich, Leeds, and Norwich quoting fully 2s. per qr. advance. At Liverpool, on Tuesday, holders held their samples generally too high, but eventually accepted 3d. per cental advance. The Scotch and Irish markets followed in the wake of the English.

On the fourth and last Monday there was a fair supply of home-growth, with more of foreign than of late. Kent in the course of the morning sent up better supplies: from Essex they were moderate.

The increased probability of war in Europe made holders high in their demands, an advance of 5s. per qr. being at first insisted on, but eventually factors were content to take an improvement of 2s. to 3s. per qr., and sales were not fast at the rise. Some holders of foreign altogether withdrew their samples, and none would sell unless at 1s. to 2s. per qr. more money; but this description having lately been held relatively high, sales were checked.

The slow course of the general averages does not show the month's advance, the rise therein being only from 40s. to 41s. 2d. per qr. Neither do the London averages make a further advance than from 43s. 6d. to 44s. 7d., but it would now seem that the lowest point is past for perhaps a long period. The imports into London for the four weeks have been 31,490 qrs. English, 37,596 qrs. foreign; against 17,414 English, 23,834 qrs. foreign, in April last year, showing a large increase, partly owing to the openness of the Baltic this season, but more from the increased supplies from France. During the month of March the imports into the United Kingdom in wheat were, 259,872 qrs.; in flour, 328,524 cwts. The four weeks' exports were, 1,390 qrs. wheat, 978 cwt. of flour.

The flour trade all through the month has been very steady, till the rise at the close. Norfolks on the second and third Mondays had risen about 1s. per sack, and on the fourth there was a further advance of 2s. per sack, making the rise 3s.; and on the last Monday the town trade raised their top price from 40s. to 43s. per sack. French was also influenced to about a similar extent. No fine American is here, the prices being much above our own.

The imports into London for the month were, in country sorts 68,090 sacks, in foreign 9,322 sacks 92 barrels; against 65,980 sacks English, 7,269 sacks 504 barrels foreign, in April 1858.

The barley trade has scarcely varied through the month; that for malting purposes has, with the season's advance, diminished in demand, and consequently in value, till its quotations have become uncertain, though to the last there has existed a lingering retail demand for this purpose. The importations of foreign have been very free, the early opening of the Baltic bringing supplies, in addition to those usually received from the Black Sea, and the low prices of this latter giving an extended consumption in admixture with oats, to cheapen that food for horses. The first Monday having the heaviest supply, this grain was then cheapened 6d. to 1s. per qr., which it subsequently recovered, on the last Monday, when the warlike rumours added somewhat to its value and increased the demand. The imports into London for the four weeks were in English qualities 7,334 qrs., in

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.
March 12, 1859	40	3	54	4	23	3	32	11	41	8	40	8
March 19, 1859	40	1	31	4	23	9	30	4	41	3	10	4
March 26, 1859	40	0	31	2	23	4	32	9	40	6	38	10
April 2, 1859	40	8	33	10	23	4	33	2	40	4	38	2
April 9, 1859	41	0	34	3	23	4	29	10	40	4	39	5
April 16, 1859	41	2	33	6	23	7	31	6	41	5	39	4
Aggregate average	40	6	34	1	23	5	31	9	40	11	39	6
Same time last year	44	5	36	8	23	8	30	10	38	3	11	4

PRICES OF SEEDS.

BRITISH SEEDS.

TREFOIL, new.....	16s. to 20s.
TARES, Winter, new, per bushel.....	s. 10 to s. 15.
MUSTARDSEED, per bush., new 12s. to 17s., brown 10s. to 12s.	
CORIANDER, per cwt.....	14s. to 16s.
CANARY, per qr.....	64s. to 66s.
LINSEED, per qr., sowing—a to 64s., crushing 54s. to 58s.	
LINSEED CAKE, per ton.....	£9 10s. to £10 10s.
RAPESEED, per qr.....	68s. to 72s.
RAPE CAKE, per ton.....	£5 10s. to £6 0s.

FOREIGN SEEDS, &c.

CLOVERSEED, red 50s. to 61s.....	white 90s. to 105s.
TREFOIL, small, 33s. per qr.....	Dutch—s. to 38s.
CORIANDER, per cwt.....	16s. to 18s.
CABBAGE, per cwt.....	38s. to 40s.
LINSEED, per qr., Baltic 52s. to 56s.....	Bombay 58s. to 50s.
LINSEED CAKE, per ton.....	£9 10s. to £11 0s.
RAPESEED, Dutch.....	62s. to 66s.
RAPE CAKE, per ton.....	£5 0s. to £6 0s.

HOP MARKET.

BOROUGH, MONDAY, April 25.—Our market maintains a healthy character, the business being only restricted by the few samples on offer.

Mid and East Kents	84s. to 100s. choice	147s.
Weald of Kents	65s.	74s. „ 84s.
Sussex	63s.	70s. „ 75s.

MEASE & WILD.

WORCESTER, (Saturday last).—A good demand for our hops since the commencement of the present year, and the crop of 1858 is now wholly disposed of, nor do we recollect any instance during the last 40 years, however small the crop, when our market was so bare of stock. A few 1855's and 1857's are now all we have to offer, and the latter have advanced within the last fortnight full 6s. to 8s. per cwt. We are afraid our plantation has been greatly reduced by grubbing since October last, and from the present unfavourable appearance of the young shoots, some planters are already anticipating a short crop.

POTATO MARKETS.

SOUTHWARK WATERSIDE, MONDAY, April 25.

Since our last report the supplies coastwise and from foreign ports, as well as by rail, have been heavy, and notwithstanding the ungenial weather we have had, the trade remains in a very sluggish state for all except the finest samples; for common sorts there is scarcely any demand, and for such the prices are almost nominal. The following are this day's quotations:—

York Regents	per ton	90s. to 110s.
Flukes		100s. to 115s.
Lincolnshire Regents		80s. to 95s.
Dunbar do.		80s. to 90s.
Ditto Reds		60s. to 70s.
Perth, Forfar, & Fifeshire Regents		45s. to 65s.
Ditto Reds		30s. to 40s.
Ditto Rocks		40s. to 50s.
Foreign Whites		30s. to 50s.

BOROUGH AND SPITALFIELDS, MONDAY, April 25.

—The importers of Potatoes last week were 182 tons from Groningen, 72 do. from Calais, 228 do. from Duukirk, and 68 bags from Antwerp. Coastwise and by railway, full average supplies are coming to hand. The best samples are in fair request, at full prices; but other kinds rule heavy at the late decline.

York Regents	80s. to 105s. per ton.
Essex and Kent	80s. to 95s. „
Lincolns	80s. to 90s. „
Scotch	30s. to 90s. „
Foreign	30s. to 50s. „

PRICES OF BUTTER, CHEESE, HAMS, &c.

BUTTER, per cwt.:		CHEESE, per cwt.:	
Friesland.....	112s. to 116s.	Cheshire.....	60 80
Kiel.....	116 120	Cheddar.....	60 82
Dorset, new.....	98 106	Double Gloucester.....	56 70
Carlow.....	98 106	HAMS:	
Waterford.....	98 106	York.....	78 82
Cork.....	100 106	Westmoreland.....	78 82
Limerick.....	98 104	Irish.....	70 80
Sligo.....	98 104	BACON: Wiltshire, dried	62 66
FRESH, per dozen.....	12s. 0d. to 15s. 0d.	Irish, green.....	58 64

ENGLISH BUTTER MARKET.

LONDON, MONDAY, April 25.—Our market is pretty steady, at say 2s. to 4s. per cwt. less money, whilst fresh Butter is in plentiful supply, at a decline of 1s. per dozen.

Dorset, prime	per cwt.	120s. to 124s.
Ditto middling	„	104s. to 112s.
Fresh	per doz. lbs.	12s to 15s.

WOOL MARKETS.

ENGLISH WOOL MARKET.

Per pack of 240lbs.

Fleeces—Southdown Hogs.....	£18 10 to £19 0
Do. Half-bred Hogs.....	13 0 18 10
Do. Kent.....	16 0 17 0
Do. Southdown Ewes and Wethers.....	16 10 17 10
Do. Leicester do.....	16 10 17 10
Sorts—Clothing, picklock.....	18 10 19 0
Do. Prime and picklock.....	17 10 18 0
Do. Choice.....	16 0 17 0
Do. Super.....	14 0 15 0
Do. Combing—Wether matching.....	19 0 20 0
Do. Picklock.....	16 10 17 10
Do. Common.....	14 0 15 0
Do. Hog matching.....	22 10 23 10
Do. Picklock matching.....	17 0 18 0
Do. Super do.....	14 10 15 10

FOREIGN AND COLONIAL WOOL MARKET.

Per lb.

	s.	d.	s.	d.
German, (1st and 2nd Elect.....)	3	4 to 4	6	
Saxon, (Prima.....)	2	4	3	0
and (Secunda.....)	2	0	2	4
Prussian, (Tertia.....)	1	8	1	10
COLONIAL:—SYDNEY—Lambs.....	1	11	2	4½
Scoured do.....	1	4	2	11½
Unwashed.....	0	11½	1	4
Locks and Pieces.....	0	8	1	11½
Slip and Skin.....	1	7	1	11½
PORT PHILLIP—Lambs.....	1	4	2	4½
Scoured do.....	0	10	2	9½
Unwashed.....	0	7½	1	5½
Locks and Pieces.....	1	0½	1	10
S. AUSTRALIAN—Lambs.....	1	6	2	13½
Scoured do.....	1	1	2	8½
Unwashed.....	0	9	1	3½
Locks and Pieces.....	0	5	1	4
V. D. LAND—Lambs.....	1	6½	2	13½
Scoured do.....	1	7	1	10
Unwashed.....	1	0	1	4
Locks and Pieces.....	1	2	1	10½
CAPE OF GOOD HOPE—Fleeces.....	1	2	2	2½
Lambs.....	1	3½	2	1
Scoured.....	1	2	2	4½
Unwashed.....	0	8	1	1½

MANURES.

PRICES CURRENT OF GUNAO, &c.

PERUVIAN GUNAO, (per ton, for 30 tons).....	£15 0 0 to £ 0 0 0
Do. Do. (under 30 tons).....	13 5 0 0 0 0
KOORIA MOORIA GUNAO, (66 per cent. Phosphate and 1 per cent. Ammonia).....	5 5 0 5 15 0

ARTIFICIAL MANURES, &c.

Nitrate Soda (per ton).....	£16 15 0 to £17 10 0	Sulph. of Copper (per lb.).....	£ s. d.	£ s. d.
Nitrate Potash or Saltpetre.....	29 0 0 30 0 0	or Romen Vitriol, for Wheat steep, 1st qual.....	35 0 0 to 37 0 0	
Sulph. Ammonia.....	14 0 0 15 0 0	Ditto, 2nd quality.....	24 0 0 28 0 0	
Muriate ditto.....	23 0 0 26 0 0	Salt.....	1 0 0 1 5 0	
Superphosph. of Lime.....	5 10 0 6 0 0	Bones, Dust, per qr.....	6 6 1 1 6	
Soda Ash, or Alkali.....	11 0 0 12 0 0	Oil Vitriol, concentrated.....	0 18 6 1 0 0	
Gypsum.....	1 10 0 2 0 0	per lb.....	0 0 1 0 0 0	
Coprolite.....	2 10 0 3 0 0	Do. Brown.....	0 6 1 0 0 0	

OIL-CAKES.

Linseed-cakes, per ton—	Marseilles.....	£9 10 0 to £10 0 0
Thin American, bris.....	English.....	10 10 0 0 0 0
Ditto bags.....	Rape-cakes, per ton.....	6 0 6 10 0
Thick do. round (none).....	Customs cakes.....	5 10 0 8 0 0

JOHN KEN, 35, Leadenhall-street, (Late Odams, Pickford, and Ken.)

ROWLANDS' UNIQUE REQUISITES,

FOR THE HAIR, THE SKIN, AND THE TEETH,

are universally held in high estimation; and the fact of the distinguished patronage they enjoy, their general use in all countries, and the numerous testimonials constantly received of their efficacy, sufficiently prove the value of their "Macassar Oil," "Kalydor," and "Odonto."

THE FIRST PRODUCTION IN THE WORLD

For the GROWTH and IMPROVEMENT of the HUMAN HAIR is

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No. 6, Vol. XV.]

JUNE, 1859.

[THIRD SERIES.

THE
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AND
MONTHLY JOURNAL
OF
THE AGRICULTURAL INTEREST.

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DR. HASSALL

ON

THORLEY'S FOOD FOR CATTLE.

FROM THE "MARK LANE EXPRESS," 10th JAN., 1859.

74, WIMPOLE STREET, CAVENDISH SQUARE, 21st December, 1858.

HAVING, on more than one occasion, been requested to make an analysis of THORLEY'S WELL-KNOWN FOOD FOR CATTLE, and to express my opinion respecting it, I placed myself a short time since in communication with Mr. Thorley, desiring to be furnished with certain particulars relating to his Food. Mr. Thorley, who was previously a stranger to me, at once conducted me over his Manufactory, showed me all the ingredients employed, and also the process of manufacture of the article.

I took away with me samples of the food as well as of every ingredient entering into its composition. I have since carefully examined and tested these, and I have also compared the samples procured at the Manufactory with others obtained by myself from other sources.

I am, therefore, now in a position to express an authoritative opinion respecting the composition and properties of THORLEY'S FOOD FOR CATTLE. I would remark of it—

First. That the ingredients used are all of excellent quality, and are purchased without regard to expense.

Second. That the receipt or formula, according to which the Food is prepared, is an admirable one, no ingredient being selected on account of its cheapness, but those only being chosen which are best adapted to fulfil the objects intended.

Having regard, thus, to the composition of THORLEY'S FOOD FOR CATTLE, I find that it possesses the following properties in an eminent degree—it is highly nutritious and fattening—it is a tonic and gentle stimulant, aiding, when mixed with other descriptions of food, materially the digestive powers of an animal—a point of great consequence, since it is an undoubted fact that much of the nourishment contained in the ordinary food given to cattle is lost in consequence of the impaired or defective action of the digestive organs.

Comparing THORLEY'S FOOD FOR CATTLE with other Cattle Foods, with the composition of which I am acquainted, I unhesitatingly assert that it is infinitely superior to any others, at present known to me. In all those of the composition of which I have a knowledge, I have found ingredients to be present which have been added solely on account of their cheapness, that is for the purpose of adulteration, and to the exclusion of other more valuable, but more expensive, articles. In some of the Foods I have detected ingredients which are positively hurtful.

Comparing, also, the samples taken by me from the Manufactory with others procured from different sources, I found a perfect accordance in the composition of both series of samples.

Before bringing this Report to a conclusion, I would notice an objection sometimes urged against the use of Cattle Foods generally, namely, that the price at which they are sold exceeds considerably that of the materials from which they are prepared; this can be readily shown to be a very unreasonable objection. THORLEY'S FOOD FOR CATTLE is a compounded and manufactured article, upon the composition and preparation of which much care, labour, and expense have been and are bestowed. Moreover, the refuse materials resulting from the cleansing, grinding, &c., and which are an entire loss, amount to twenty per cent. To estimate, therefore, the value of such an article merely at the cost of the raw materials is both absurd and unjust.

Neither must the value of this, or any other Cattle Food, be determined by the exact amount of nourishment contained in them; although in the case of THORLEY'S FOOD this is very considerable, but the indirect effects resulting from its employment must be taken into consideration; that is, the effects of the article in improving the appetite, digestive powers, and general vigour of the Cattle fed upon it. By the improved condition of the digestive organs animals may be fed upon coarser and cheaper articles of food, and from which, without the aid of THORLEY'S FOOD, they would be unable to extract all the nourishment which such articles actually contain. I consider, then, that the use of THORLEY'S FOOD is attended, not with an additional, but with a considerable saving of expense.

I am glad, therefore, to be enabled to recommend—which I do strongly and conscientiously—THORLEY'S FOOD FOR CATTLE as a highly important and valuable compound for the feeding of all descriptions of Cattle.

Signed,

ARTHUR HILL HASSALL, M.D.,

Analyst of the Lancet Sanitary Commission; Author of the Reports of that Commission; of "Food and its Adulteration;" "Adulterations Detected;" &c., &c.

From Alfred Brown, Esq., Wandsworth, Surrey, Member of the Royal College of Surgeons, England; Licentiate of the Apothecaries' Company, London; Fellow of the Medical Society of London; late Demonstrator of Anatomy at the St. George's School of Medicine.

Wandsworth, Surrey, Dec. 11, 1858.

Sir,—I shall feel obliged by your sending me another cask of Thorley's Cattle Food. I have been making experiments with it upon one of my milch cows, and think it only fair that I should let you know the results. My cow, before I used the Food, was fed upon hay, wortzel, and water *ad libitum*, and upon this diet she yielded one gallon of milk per day, making two pounds of butter per week. She was five months gone with her second calf; when she had the Food I discontinued giving her the wortzel, and gave her a measure-full (about half-a-pint) of the Food with a peck of damp chaff night and morning; besides, she had as much good hay as she would eat. Upon this diet, in less than a week she doubled the quantity of milk and butter; and in order that I might be sure that this excellent result depended upon the Thorley's Food, I discontinued it, and returned to her former diet, and she speedily went back to the gallon of milk per day. After waiting about a fortnight, I again returned to the Thorley's Food, and in a few days she increased to two gallons of milk per day. This experiment I repeated several times, and with the same results. I have tried the Food upon other animals—horses, sheep, &c.—and with the most satisfactory results. I have also analysed the Food, and find that it contains nothing that would in any way injure the system or constitution of cattle. You are at liberty to make any use you please of this communication, and I am, Sir, yours, &c.,

To Mr. J. Thorley.

ALFRED BROWN.

THE FARMER'S MAGAZINE.

JUNE, 1859.

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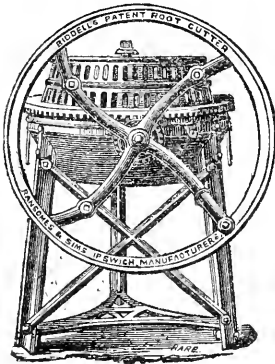
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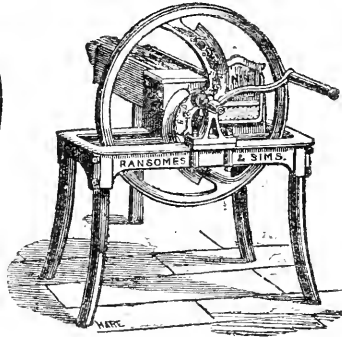
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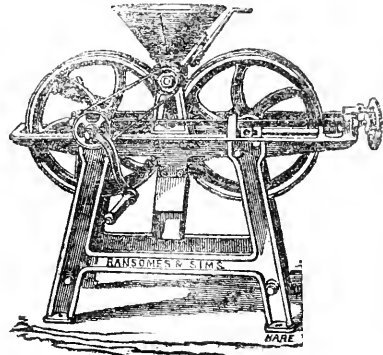
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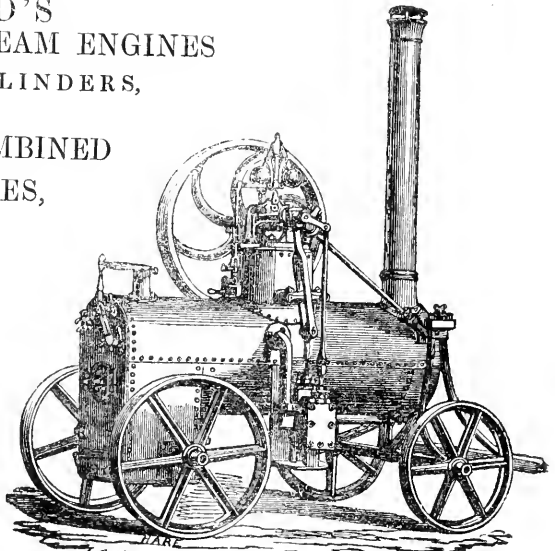
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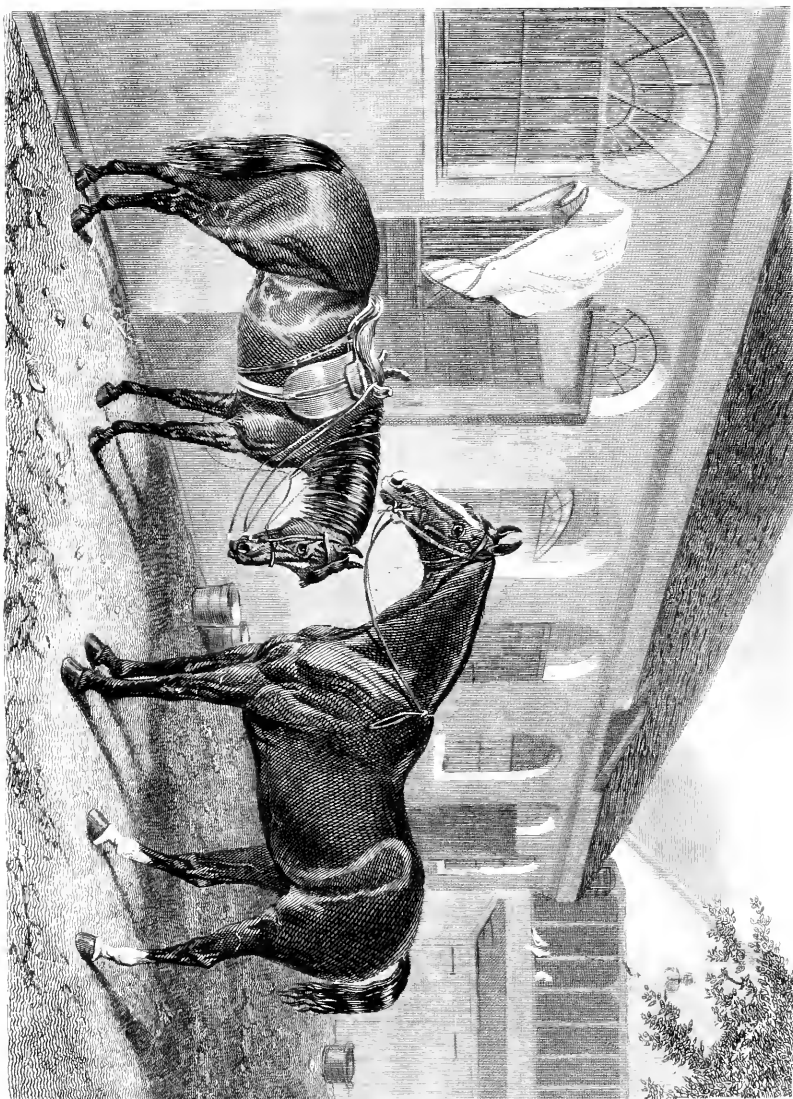
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London: H. Bailliere, 219, Regent-street.





THE FARMER'S MAGAZINE.

JUNE, 1859.

PLATE I.

THE STABLE YARD.

Some two or three years since, in continuation of our series of eminent agriculturists, we gave a portrait of Mr. James Allen Ransome, of the famous firm of Ransomes and Sims, implement makers. In concluding our sketch of his good sayings and doings, we wrote thus:—"If we say more we shall but make our hero mortal, and chronicle him, like most of us, as not proof against some little weakness or other. That of Allen Ransome, if such it be, is a national one—the love of a horse. The neatest hack at the Suffolk shows is almost sure to be 'Mr. Ransome's.' Himself a good horseman, and a good judge, no wonder he confessed, in the openness of his heart, as we once heard him, that 'much as he loved a steam engine, he loved a horse still more!'"

We have now followed him home to his own stable yard, to see what he can show us in the way of the animal he likes so well. Either of those in

the print may be regarded as an especial favourite, selected with much care for their several uses. The dark chesnut white-legged weight-carrier is an Irish mare, called Norah Creina, purchased of that well-known dealer, Mr. Sam Quartermaine, once of Oxford, and now of Piccadilly. The young lady's pony, The Fawn, comes from an equally good school, having for some time carried the daughters of Mr. Anderson, also of Piccadilly. There is something of a character at once implied in such last places as these two clever hacks can refer to, and both would appear alike worthy of the recommendation. "For action, temper, manners, and education," quaintly writes their present possessor, "they approach more nearly to perfection than is often found in horseflesh. They are in every respect worthy of Corbet's pencil, and certainly his painting is worthy of his subject."

PLATE II.

THE QUEEN OF TRUMPS; A SHORTHORN HEIFER.

THE PROPERTY OF MR. JAMES DOUGLAS, OF ATHELSTANEFORD, N.B.

The Queen of Trumps, a roan heifer, bred by Mr. Douglas, and calved on April 27th, 1856, was got by Captain Balco (12546), out of Queen of Trumps, by Belleville (6778), her dam, Queen of Trumps, by Captain Shaftoe (6833), — Old Cherry, by Pirate (2430), — by Houghton (318), — by Marshal Blucher (416), &c., &c.

In 1857, when a yearling, the Queen of Trumps was highly commended at the Salisbury Meeting of the Royal Agricultural Society of England; Colonel Towneley's Rose of Towneley taking the first prize, and Mr. Richard Booth's Queen Mab the second. Colonel Towneley had two more heifers also highly commended, and the whole of the class, one of the strongest ever shown, was commended. At the Northumberland Society's Show, at Cornhill, Queen of Trumps took the first prize
OLD SERIES.]

as the best yearling heifer, beating, amongst others, Mr. John Booth's Venus de Medicis, which Mr. Douglas purchased there and then for three hundred guineas. At the Glasgow Meeting of the Highland Society, Queen of Trumps took the first prize for yearling heifers; and at Waterford, the Queen and Venus again came together, when the Cornhill judgment was confirmed, the roan being placed first, and the white receiving a high commendation.

In the spring, however, of the year following, at the show of the Royal Dublin Society, they changed places, Venus de Medicis taking the first prize, and Queen of Trumps the second. At the Chester Meeting of the Royal English Society, the Queen "righted" again with the first prize, Venus being highly commended, and Lady Buckingham, a heifer, the property of the Honourable and Reverend

Noel Hill, dividing them. At the Yorkshire Meeting, at Northallerton, they declared Queen of Trumps the best, Mr. Booth's Queen Mab a good second to her, and commended Venus and Rose of Towneley. It will be seen that the Scotch heifer here got her revenge on the two placed above her at Salisbury in the year previous. At the Hexham Show of the Northumberland Society it was still the Queen first, and Venus second. Crossing once more to Ireland, for the National Meeting at Londonderry, the beautiful couple met us in the same positions, as first and second of their class, the Queen of Trumps also taking the Gold Medal as the best heifer, and the Purcell Challenge Cup as the best animal of the show. At Aberdeen our history is yet but an echo, the Queen was first, and the white second. But after it was over, one of the judges assured us, he had held out strongly for Venus, not knowing at the time she had ever been preferred by public award to her companion. To the very last, however—and we saw them achieve all their great triumphs—the two had their partizans.

The Queen of Trumps thus stands recorded as the winner of the three national prizes, at an age when a shorthorn shows better than at any other. Curiously enough Mr. Douglas went the very same successful round only the year previous with the Rose of Athelstane, also by Captain Balco; the only two occasions, we believe, on which this has been achieved with the same animal. In October last, after returning from Aberdeen, Queen of Trumps was sold to Mr. Barret, of Henderson, Kentucky, for four hundred and fifty guineas, Mr. Douglas warranting her in calf to Sir James the Rose, and due to calve on the 1st of March. She sailed accordingly from Londonderry, in November, for New Orleans, with fifteen other head of cattle, all of which but two died on the passage; the Queen of Trumps lived within a day's sail of port, when she too succumbed. As some of the premiums were awarded under the regulation that she had a calf born alive, Mr. Douglas will lose these; although there was no question the heifer was heavy in calf when she died.

Without attempting to write up our subject, a few extracts from our own reports of last year may show the extraordinary and well-merited success which has attended Mr. Douglas, not only with the Queen of Trumps, but many more of his heifers. Thus, at Chester, we said, "In the cow classes Mr. Douglas must on the whole be ranked as only second to Mr. Booth, from whom he *will* have his best blood." Then, at Londonderry, and we will keep ourselves to the three national shows—"We have to report another famous entry of shorthorns, the numbers of which came very much to a par with those at Waterford last year. But to prove

the superiority of the sample, it may be added, that the then best of all the animals was only the best of her class here—Mr. Douglas' The Rose of Athelstane, who took the first prize for cows. She was still beaten for 'the best of all' by one of her own herd, and a half-sister—the now famous Queen of Trumps. The latter was again side by side with Venus de Medicis, and the vexed question as to the pick of the pair was decided in confirmation of the Chester award. In fact, the Queen of Trumps appears to have improved ever since then, and it is difficult now to imagine how the white heifer could have ever had the advantage of her. The quality of either is excellent; but her majesty is the more roomy and broader, of a better colour, with a better head, and certainly with the preference in point of general appearance. But they are both extraordinary animals, and should be painted—as they so often have stood—together. Mr. Douglas thus wins the new Purcell Challenge Cup for the second year in succession, and it looks more than probable that he may follow Colonel Towneley's example, and secure it during the next. He also wins the Gold Medal with the Queen of Trumps as the best cow; while his especial success does not even end here. The Londonderry meeting inaugurated another challenge cup for the best three horned animals shown in the same section, and the master of Athelstaneford claimed this also with three beautiful heifers, all of his own breeding. So generally good were they, that in a remarkably superior class of over thirty, they were only just separated. One took the first prize, and the other two were highly commended." And thirdly and lastly, at Aberdeen:—"In the show of cows and heifers, Mr. Douglas went far to make it all it was, and of course with some old and established favourites. Ringle was once again the best cow, and Queen of Trumps and Venus de Medicis, for the third and fourth time this year, the two best heifers. The preference was still for the roan, although it is only right to say, one of the judges was all for her companion, who, as Venus should have, has a beautiful bosom, and fine turn of the arm and shoulder. The Queen, however, has now taken the three national honours of her year, having been placed first at Chester, Londonderry, and Aberdeen. She is of Mr. Douglas' own breeding; but Venus was bought, after having been beaten last year, of Mr. Booth, for 300 guineas; and when defeated again at Chester, her former owner offered 450 gs. to get her back—no bad compliment from such a quarter to Mr. Douglas's judgment and management. In the yearling heifers the Athelstaneford herd was yet more pre-eminent—first, second, and third; the best of these was also the best at Londonderry, and the other two first and second at the Glasgow Show of this summer."

THE HERDS OF GREAT BRITAIN.

CHAPTER VII.

THE AYLESBY HERD.

Since the days when Richard Ostler mounted his bit of blood, and rode with his saddle-bags to Barmpton and Ketton, to try and effect a good bull hiring with the Collingses, Aylesby has always been a chosen home of the Shorthorns. Robert Collings might well declare at his sale, that "no one has so much of my blood as Ostler of Lincolnshire;" seeing that Aylesby (44) by Favourite, dam by Favourite; Barmpton (54); and "Brother to the White Heifer that travelled," were nearly always in residence. His foible was, that he was ready to sacrifice everything for form and neatness; and in his desire to "get them to fall small," he made them very delicate as well. He had quitted Aylesby for Audby near Louth, when his stock were sold off in the April of '31; and in consequence of their deterioration, and the gloom of the era, his average was a very poor one. "Commodore by Rival, £71," was knocked down to Mr. Codd, of Holton, who was then styled the Collings of Lincolnshire; and Mr. Torr, who was farming with his father by, went in for Flora by Cato, and her dam Cherry, and three or four others. At this time, Philip Skipworth was Mr. Drake's tenant at Aylesby Manor. No one had better original ideas on breeding; but although an old tup, Garrick and Granby to wit, was his especial crown of rejoicing, he had quaint stories to tell of every bull in the North, and of every Yarborough foxhound.

Neither Charles Uppley among the elder, or Tom Brooks and Field Nicholson among the younger "Brocklesby boys," could beat him over the cream of the country, from Grainsby Healing to Roxton Wood; and he derived his Shorthorn title from the purchase of "Young Favourite (252) by Comet, 140 gs.," upon the Ketton; and "Lilly" and "Violet," by North Star, and "Princess 155 gs.," upon the Barmpton day. It was, however, as a breeder of Leicesters, that he has left a name; and Mr. Torr reaped the advantage of his experience, when, in 1847, he purchased four hundred of his ewes, full of Granby blood, for £1,800; and in the following year entrenched himself as tenant within the moat of the old Manor House. He thus acquired a rare germ for the future Aylesby flock, as "old Philip" had never been thrifty at a tup letting, and he knew equally well when to hold. Philip Skipworth, senior, who was the lucky purchaser of Dishley-bred ewes, first established the flock. Such was its fame that the Leicestershire Society in vain offered him 300 gs. for the use of "The Aylesby A;" and when four Lincolnshire men had conjointly hired one Leicestershire tup for 1,000 gs., he did not scruple to give 600 gs. for another on his own account.

Succeeding to such an Aylesby "field azure" in sheep heraldry, we can hardly wonder that Mr. Torr's heart is even still even more with Bakewell than Booth. The

choicest rams from the Bakewell, Stubbins, Breedon, Stones, Buckley, and Burgess flocks had all done good service to Philip Skipworth, and Mr. Torr has maintained their pure seventy years' lineage, by only going for his blood to Normanton, Barrow, and Holme Pierrepont. His Leicester ram flock, whose letting has become quite a Lincolnshire festival, early in September, numbers about a hundred; last year 555 of his Leicester ewes were put to them; and about two thousand sheep in all are annually brought to his clipping boards. Their little white ivories, which leave but a doubtful reversion for the Shorthorns, have boundless scope, as the three farms at Aylesby, Riby, Rothwell, and the marshes near the Humber, amount to upwards of 2,100 acres, of which 500 are in permanent pasture.

There had long been a good old-fashioned breed of Shorthorns at Riby, with Badsworth (47), and Palm-flower (480) as their progenitors; but Mr. Torr has got entirely rid of them, along with the delicate Ostlers, and the doubtful blood of Lord Adolphus Fairfax. This magnificent impostor was as handsome as a picture; but after paying 100 gs. for him to Mr. Whitaker, conjointly with Mr. Smith, of West Rasen, he was well sold for 300 gs. "Waterwitch by Fourth Duke of Northumberland, 56 gs.," at the Rev. Mr. Cator's sale, was a purchase of a different caste; and at present two dozen of her female descendants preserve the memory of Kirkleavington at Aylesby. Her dam Waterloo Third was one of the two Norfolk cows, which passed over to Skelbrook at 80 gs. each. Mr. Cator would have had no such luck, but the praises which were bestowed upon them by every visitor reminded Mr. Bates so vividly of the one season's exchange between Norfolk and his Second Hubback (which destroyed all kind feeling, no one knew why, on his part towards Mr. Whitaker), that he could no longer bear the sight of them in the old cow pasture on the Yarm road. Waterwitch was calved in 1843, and only fed for the butcher last year, after breeding seven heifers to Baron Warlaby, Vanguard, and Crown Prince; and the produce of these, crossed again with Booth's bulls, are among the leading features of the present herd. Besides hiring exclusively from Warlaby for sixteen years, Mr. Torr has availed himself of every favourable chance to pick up females of the same descent. Sylphide with her two daughters Sylph and Young Bracelet, and her granddaughter Bracelet Third by Vanguard, together with Gertrude and her daughter Lady Hopetoun, and the two Killerby Maids, are accessions from the Killerby herd; Fair Maid (with her two daughters, Fair Fame 1st and 2nd—both by Vanguard), and Britannia trace direct back to Fame and Broughton of Warlaby; and Blanche and Rennet, who have fourteen in their clan, hold the same relation to Young Anna, the lot 2 of the Studley sale.

In point of magnitude the herd exceeds anything

in the Shorthorn world. At the present moment it contains about 120 females, of which only eleven are not by Booth's bulls, and fifty of them figure on the calving list, principally to British Prince. Mr. Torr has always been, not only one of the staunchest, but the very earliest adherents of Warlabby. Beginning to hire from Mr. Richard Booth in the spring of '44, no less than eighteen bulls of his, including assistants, have passed through his hands at all prices, from 60 gs. to 200 gs. He paid the latter price for Hopewell for two years, and claimed him among several competitors, when he returned from Ireland, where his stock have done such yeoman service to their owners at shows and elsewhere. In spite of the price, he was one of the cheapest bulls that ever came to Aylesby; but a fall from a cow disabled him at the beginning of his second season, although we are glad to hear that his native air is likely to restore him to his sphere of usefulness. He got about 40 calves for Mr. Torr; of which, as is often the case with elderly bulls, nearly two-thirds were heifers, and the whole of them in the present herd. Leonard was the first bull to come, and he was taken, in consequence of the 150-guinea hiring bargain with Mr. Bates for the Fourth Duke of Northumberland, having gone off on a moot point, as to his only bulling twenty-five out of the thirty cows which then formed the Riby Herd.

Without being a show bull, Leonard was almost fuller than any bull of his day, of good individual points, and he communicated a constitution and *solidarité* to the herd, which it has never lost. It was this feature which made Gem at Killerby, and Hope at Warlabby, so priceless; and it was of the former that the Lord Spencer said to Mr. Torr, in his quiet decisive way, "She is the best specimen of a Shorthorn I ever saw." Buckingham, then in comparative obscurity, came as a help to Leonard in his second season, but he left no females behind him. Baron Warlabby was then the premier for two seasons, and six fine cows are the only remnants of his fifty-seven. The Vanguards form a complete army, and exactly a fourth of the 180 calves, which were entered to his seven seasons' credit, in the "Aylesby Herd Book," are at present among the females of the herd. His stay was divided into two periods of three and four years; and during the intervening year, 1852 (which he signalized by getting Bride Elect), Crown Prince took his place there. He left two-and-thirty calves behind him, and as the great majority of them were males, and Summer Sun and Gold Drop are in the Imperial stalls, only half-a-dozen cows, headed by Guiding Star, preserve his royal line. Helmsman, Majesty, Clarence, Prince George, Benedict, Roseberry, Thornberry, Tophorn, Leonidas, and Bridesman, have also been billeted here, but the first eight are unrepresented now. Mr. Torr has very seldom exhibited the Booth bulls, but on one occasion Baron Warlabby beat Baron Ravensworth and a large field of yearling bulls at Market Rasen; and Vanguard was one of the nine which went to Gainsboro', without having tasted a pound of oil-cake, and all returned with first or second rosettes.

Stepping down the drive, and having "made things

comfortable and pleasant" with the Castle Howard bloodhound, of a pedigree as ancient as Belted Will's, we entered the Church Barn Yard. It lies within a stone's throw of the house, and is overlooked by that tower which served for the beacon of the first steeple race in Lincolnshire, and gloried, time out of mind, in those elderberry bushes, which grew forth from dragons' heads, and for whose vested interests Philip Skipworth battled so stoutly against archdeacons and rural deans. The barn, whose laurel-clad roof-tree has so often rung again at the Ram Dinner, when the late Mr. John Booth rose to give one of his racy John Bull acknowledgments for "the Shorthorn breeders of England," flanks one side of the boxes, which are all condemned. Their present occupants are three Hopewell bulls, and first and foremost among them is Booth Royal, from Killerby Gertrude. He is a fine roan, not particularly handsome in the horn, but well carrying out the Booth character in his wealth and thickness of flesh; and so much is he to Mr. Torr's mind in pedigree and form, that he intends to break through his conventional practice, of not using bulls he has bred himself. Watchman, a red and white, out of a Vanguard dam, goes back to Bates's, Waterloo III.; and Golden Hope (the last of Gleamy's sons, and full of the Vanguard character, with the coat of Londesboro'), to Mr. Robson's Constellation and Young Favourite tribe, on which, as well as Londesboro', by Booth's Tomboy, his owner has always pinned his faith. Two young Hopeful heifers stand hard by, the one from Glittering Star, by Vanguard, for choice. The blood of these two bulls has united singularly well, Vanguard contributing the size and substance, and Hopewell the elegance.

Hence we strolled onwards into the old kennel yard, from which, even before the days of the Pretender, the combined pack of Pelham and Twyrwhitt went forth to try the furzes for fox or hare, and had miles upon miles of unenclosed breezy wolds for their hunting ground. The dove-cote outside seems nearly of the same date, but still it affords a snug canopy to Star of Hope (a white half-brother to Silver Star), who was bound, along with Fine Hope, from Flower, to the Clarence River in Australia, with a hundred guineas on each of their heads. They both went there as proxies for Silver Star, who was sold for 150 gs., and fell ill when his berth was taken. He won as a yearling at Grantham, last autumn, and was highly commended at Chester; and that gentle curly white head and rich quality and substance deserve a much nobler fate. His own sister, Sweet Valentine, lately went for 120 gs., at three years old, to the Emperor of the French, with four companions, at very nearly the same figure.

Crossing the road, we reach the last remnant of thatch and mud, which marks the Ostler era. An artist would turn a very scornful eye at the brace of model cottages on the right, and dash this hovel joyfully into his canvas. Old Rennet, by Fanatic, out of Red Rose, is in keeping with her residence, and looks like the very genius of Shorthorn antiquity, with her wasted frame, and her game leg. She runs entirely back, as we have observed, to the Anna tribe at Studley, and was knocked

down to Mr. Torr, at the Bushey Grove Sale, in 1853 for 40 gs. He was assured that he would never get her home; but he did notwithstanding, and she has had three calves to Vanguard, one of which, Ringleader, was sold for 150 gs., and she has now a very grand one, Royal Hope, by Hopewell, at her side, for which the above sum would be offered in vain. Her shoulders are still very clean and fine, but the back sinews of her off hind fetlock have defied a whole druggist's shop of iodine, cantharides, and liquid blister. Still she breeds very regularly by being kept cool; and Mr. Torr has always had such a fancy for her, that he bid 145 gs. for her daughter, Rival, by Puritan, at the same sale; but Mr. Harvey Combe was not to be foiled.

Leaving her on the left, we came next to a number of new fold-yards, with tile-covered sheds, most admirably adapted for young stock, and as these are shortly to be faced by a large number of loose boxes, this "Old Garth" will become the head quarters of the Shorthorn colony. In a temporary box near them we espied four Hopewell heifers, two of them twins out of Gilt; and another a grand-daughter of Water Witch, which well bears out Mr. Torr's experience, that the second cross of Booth on Bates realizes expectations, while the first is often disheartening. The "Hopewell heifer head" began to multiply itself, as we looked into the first fold yard, and met the gaze of eight out of ten by him. The other two were by Vanguard, from the Hopewell cows, Young Bracelet and Lady Hopetoun. Young Bracelet was bought at the Killerby sale for 40 gs., and combines the blood of old Bracelet in an eminent degree, on both dam's and sire's side. Among the next eight, is a splendid red heifer, War Medal, from Warrior's Bride, who is a successful instance of a third cross on Bates, and might tempt many a man to "train" forthwith. Five cows stood together in the adjoining yard, and among them Lady Hopetoun, from Gertrude, (who was bought by Mr. Torr for 160 gs., at Mr. Bolden's Springfield sale); thick, low, and neat, but rather big in the hips. There, too, was Gleamy, a fine stylish Vanguard cow, for whom, in 1854, the Ohio Company bid 150 gs., the very day she cast her calf. She beat a large field of cows at Louth three years after, and Gleam, by Baron Warlabby, then a grand trio, Glisten, Glittering Star, and Gloamin, by Vanguard, and Grey Dawn, by Grey Friar, are the best testimony to her private and public worth.

The highest purchase of the herd was now to come in Britannia by Bolden's First Grand Duke, from Booth's Bridget, by Baron Warlabby. She was knocked down to Mr. Torr for 270 gs. at Mr. Ambler's sale; and he offered Mr. Bolden 300 gs. for her half-sister Bride Cake, in vain. Such was her state of fat when she came, that it was necessary to put her into a regular course of reduction by walks and treacle, and under this régime she defeated Mr. Wetherell's celebrated Venus at Crantham. After coming to Aylesby she bred a roan bull calf to Hopewell, but it only lived half a day; and she is due to British Prince in June. She is a very fine model of a shorthorn: lengthy and near the ground, and with a very sweet head, and looks to have constitution enough

to go on a mountain top. But for her somewhat high hips, many would consider her as pretty nearly symmetry itself. The great stylish Garland looked as blooming as she did at Fawsley; although the yellow, red, and white are somewhat against her, in spite of the Hubback precedent; but Mr. Torr has no reason to sigh after the 91 gs. which he bid from the ladder on that drenching day. One of Glisten's eyes has closed on this sublunary scene; and as she has ceased to breed, the critic's eye will rest on her no more except as a Christmas-beef candidate, at more than five-and-twenty stone a quarter. The elegant Flower by Baron Warlabby is also on the wane, after having produced twins last year to Hopewell, and a bull calf to him this year; which has, we trust, without reason, been termed *Final Hope*. A lot of heifers suckling their calves occupied the last yard; and among them the clever Gayhope may well inherit the Booth loin and hair, as he has no less than four direct crosses of living Warlabby bulls—Hopewell, Bridesman, Crown Prince, and Vanguard—in his pedigree; while the handsome roan heifer calf, Village Hope, beside him, out of Village Maid by Crown Prince, goes back to Whitaker's celebrated Wharfedale Lady.

This inspection over, we harked back to the kennel-yard, and had a look at Guiding Star by Crown Prince, who reminds us more of Nectarine Blossom than any cow in the herd. Here, too, was Bright Gem, with a very beautiful calf, Benign Hope, which is perhaps the most sweetly moulded young thing in the herd. Youth and age came into strange juxtaposition when the ancient remains of old Gertrude, who was bought for 100 gs. at Mr. Bolden's sale, emerged from the next box; but the fine handling and "arched rib springing from a straight back bone" (as that rare judge, the late Mr. William Hargrave, of Caistor, was wont to say) are still there, and she is in calf to British Prince. Her son, Blood Royal, a large, massive bull, with whom she was in calf to the Duke of Bolton at the sale, was tied up near her. He may well bear his name, as his sire was by Grand Duke from Florence, by Second Duke of York, g. d. Booth's Fame—a treble combination seldom achieved. Silver Star was far too ill to think of stirring; but British Prince, the *locum tenens* of Hopewell, came on to the parade ground. He is by Crown Prince from Bianca, and although not a bull on a large scale, he has remarkable compactness of form and fine loin, and his bosom is only exceeded by that of his half-sister Bride Elect.

Having thus disposed of the home department, the white "woldsman's pony" took us, at a smart canter, in the wake of a kinswoman to Orestes (on which our host made very strong running), through the hundreds of "white ivories" to the first outlying farmstead at Irby Dales. This celebrated glen contains one of the best echoes and surest fox-finds in the Brocklesby Hunt; and it is on record that the merits of the grey Peter Simple were first discovered in a run from it, in a very misty day. Mr. Torr's holding is at the very head of the glen, near which is a long sedgy lake, on which scores of black Buenos Ayres ducks, with their burnished

green heads, were besporting, with countless water hens. There was also quite a cloud of grey Dorkings feeding in the yard, with a long Aylesby pedigree, and fading into an ancient Captain Barclay vista, forty years beyond that. The fold yards here had a full Vanguard complement of something like forty animals. Among the first ten, Genuine Gem might well inherit his somewhat Roman head and rich roan colour, as she is by him out of his daughter Glisten. Fair Fame 1st, by Vanguard, dam by Usurer (a great granddaughter of Fame, own sister to Booth's Faith), was also there; along with the elegant Warrior's Bride by Bridesman, another valuable testimony to the truth of the second cross of Booth upon Bates. The dozen in the next yard were all Vanguards except Fawsley Garland I (an own sister to Chrysalis and Glass Slipper), who shows all that elegance of fore-quarter on which Sir Charles Knightley laid such stress. Here, too, were Fair Fame II., Bright Comet, and Flower Nymph, the latter one of the especial plums. Grey Friar, who came to Aylesby, as a loan from Mr. Wiley, was well represented among the dozen in the third yard by Grey Dawn (who won the second yearling prize ribbons last summer at Grantham), and also by Matin Bell, who has a strong ring of the Leonard metal in her. Fawsley's Garland II. is a very fine heifer, but unfortunately follows her dam in colour. Already the old cow has bred four heifers at Aylesby; and her daughter Chrysalis, for whom Mr. Sanday gave 150 gs., has added two bulls and a heifer to the Holme Pierrepoint herd, so that the impromptu partnership which that gentleman formed with Mr. Torr at Fawsley has proved most satisfactory to both. As a farewell to the young stock, we took some observations on Glittering Star, who may hereafter shine to some purpose in a national show-yard, if Mr. Torr for once waives his dislike to that force-meat principle, which is now the only key to such honours.

A short ride across Irby Dales, and a series of highly cultivated fields, brought us to the Riby Wold Farm, which has been held by the family, under Mr. Tomline and his ancestors, for nearly a century and a half. Its yards are principally appropriated to the steers and gelt cows, the majority of which are bound in due season

to the marshes on the Humber side; and it was from here, some fifty years since, that Mr. Torr's grandfather, who was one of the very first to use oil-cake in Lincolnshire, sold two score stall-fed bullocks for £40 a-piece. The Riby home farm, which is also tenanted by several very promising Vanguards and Hopewells, lies a little lower down on the opposite side of the road to the church, and within a bow-shot of the squire's. Aylesby Rose, by Leonidas, with her hip down, and a wonderfully coated calf, Aylesby Ball (by Golden Ball, a son of Vanguard's), at her side, is here to remind us of Aylesby Lady, who was sold for 200 gs. to the Ohio Company; and it would have been strange to have spared no glance for a roan heifer calf, Wave Hope, by Hopewell, out of Water Queen, who is nearly as good as she can be, and instance No. 3 of the efficacy of the double cross of Booth on Bates. Grey Friar's stall knew him no more. He had risen to the full-blown dignity of one hundred stone, and as digestion was not a vital object to the captains or crews of two Norway sloops, who put in at Great Grimby on their way to Greenland, they took him at six shillings per 14lbs., and divided him limb for limb. Government contractors for "prime mess beef" would have burned with jealousy if they had seen those massive duplicates in process of shipping; and in fact, we hardly dare to further inflame their minds by the recital of the end of Benedict, an own brother to Bloom and Plum Blossom, whom we were just in time to see in the flesh. He was originally sold to Mr. Bolden, in whose hands he hardly got anything but bull calves, and then he went, we believe, the round of some small Cumberland herds, and was eventually chopped away to Mr. Torr by Mr. Unthank for Free Mason. To counterbalance a poorish chine, he had rare hind quarters and fine quality, but there will never be a calf by him at his last abode. Before he came here, he had passed fourteen years of a Benedictine, but not an unfruitful, existence, and the epitaph of this nearly eldest son of Buckingham fell rather quaintly on his owner's ear last month, from the lips of the Aylesby herdsman, as he dwelt in memory on the staple of a succession of dinners—"Uncommon tough, sir; but varra sweet."

MEAT AND MILK.

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

There are few farmers to whom the comparative profit of the churn and the stall are not objects of the greatest interest. In this, as in other branches of agriculture, practical and scientific researches have recently yielded considerable *general* benefit. It is true that we often find, after these beneficial discoveries are publicly announced, that some farmers, in remote places, and perhaps without any communication with each other, have been long employing, with profit, the same modes that cost more recent authors long labour to discover. But

then this should not detract from the merit of those who have not only made improvements, but have had the good sense to report, for the benefit of the community, the fruit of their valuable labours.

It is both amusing and instructive to observe the slow progress our ancestors made in inquiries such as those which are the subject of this paper. Their ideas of a good cow, for instance, were of the most primitive kind. Even Worlidge, who wrote his "Mystery of Agriculture" in 1669, could find nothing more useful to remark of the cow than,

that "The best sort is the large Dutch cow, that brings two calves at one birth, and gives, ordinarily, two gallons of milk at one meal."

Then as to *feeding* the cow. As, two centuries since, her owners had only grass, hay, and corn, they were used to kill their cattle for beef at Martinmas; and those cows they preserved during the winter must have been generally very sparingly dieted, and their milk consequently poor. This must have been especially the case in the more elevated and northern portions of our island.

Those who are aware of the abundance of excellent meat, milk, and butter, with which the Scotch markets are now replenished, may well be amused with the very contrary state of affairs which existed in Caledonia about two hundred and fifty years since—at a time, be it remembered, when green crops were unknown, and root crops and cake not yet "invented."

It was about October, 1616, according to Chambers (*Domestic Ann. of Scotland*, vol. i. p. 472), that preparations began to be made in Edinburgh for the reception and entertainment of King James the First, who was expected in the following year to visit his kingdom of Scotland. Considerable repairs were ordered, and improvements made in the royal palaces of Holyrood and Falkland. A proclamation was made that "Beasts be fed in every place, that there might be abundance of flesh when the King came to the country." It is evident, too, that in those days the good city of Edinburgh was not remarkable for its cleanliness, since the Privy Council deemed it necessary to issue orders to its inhabitants to prepare clean lodgings for the King's friends and attendants, and to have the streets purified.

The Chancellor's circular to the Burghs, ordering them to arrange with their butchers for the furnishing of "fed beef" against his Majesty's "here-coming," continues Chambers, met an amusing reply in the case of one little town—Western Anstruther. "Our town," says this response, "is ane very mean town—yea, of all the burghs of this realm the meanest. *Nather is there ane flesher (butcher) in our town, nor any other person that is accustomed with feeding of beef, we being all sea-faring men and fishers.*" Nevertheless, the two bailies were evidently determined not only to do their best, but to set about it forthwith, since they informed his lordship that they "had dealt with some honest men of our neighbours to feed beef; and had enjoinnt them to have in readiness the number of four fed holt against the time of his Majesty's here-coming, which may be lookit for in our town."

Easter Anstruther, which it seems has always been a better sort of town, was equally unac-

quainted with "that trade of the feeding of beef;" but the bailie, nevertheless, had "taken such order that there shall be in readiness, to that diet, twelve oxen of the best we can get for money." The honest and canny burghers of Dysart deemed it necessary to be very cautious in what they undertook in this, to them, novel trade of beef-making; they only promised, therefore, to have ready, "Ten or twelve sufficient and weel-fed beasts upon competent and reasonable prices, and shall feed and keep them *sae lang as we may possibly get sufficient food for them*, according to the season, *not doubting of your lordship's satisfaction in case of our losses.*"

Such difficulties in winter-feeding cattle have been experienced, in some places, almost to our time. Aiton, who described the agriculture of Ayrshire, early in the present century, tells us that the winter food of the dairy stock, even at that period, was only the straw of oats, or, towards the muirish parts of the county, the hay of bog meadows, frequently but ill-preserved. For a few weeks after they calved they were allowed some poor corn, and chaff boiled, with infusions of hay; and, by way of luxury, a morsel of rye-grass, or lea-hay, once every day; and of late years, by some farmers, a small quantity of turnips in the early part of the winter, and a few potatoes in the spring, have been added.

The editor of the *Quarterly Journal of Agriculture* (vol. 1859, p. 661), in quoting this report of Aiton, refers also to the calculation of Sir John Sinclair, who supposed that the same quantity of herbage that would add 224lbs. to the weight of an ox would produce 900 gallons of milk; and thence draws the conclusion, that if we reckon 6 oz. of butter to be the average weight obtained from a gallon of milk, we shall thus get 337lbs. of butter from the same quantity of herbage as Sinclair supposes will produce 224lbs. of beef. Or if we convert the two into their respective money values, then, according to the present rates, we shall obtain, at 7d. per lb., £6 10s. 8d. for the beef, and at 1s. per lb., £16 17s. as the value of the butter. The evidence of Sinclair pretty well supports the general conclusion of the farmer, that the sale of milk and butter is, under fair circumstances, the most profitable mode of converting vegetable food into money.

But still the comparative *profit* must not be regarded as practically that to which I have just alluded. The much greater labour needed in the conversion of cream into butter must be taken in account; and this is no mean item in a dairy. It is the value of this labour, in fact, that gives the small working dairyman the advantage; for he receives, in the value of the butter, high wages for all the care and time he

bestows in his dairy. It is the difficulty of ensuring good dairy management, indeed, which prevents many farmers from engaging in this profitable branch of farming. Still, as our large and annually increasing consumers of fresh butter will probably continue to ensure full prices to the farmer, it becomes very important that the production of butter should be increased in amount, and yet its quality carefully maintained.

Before, then, I endeavour to promote this very desirable object, by referring to the recent labours of one or two great dairy owners, let us refresh our memory by re-examining the average chemical composition of ordinary milk. This may be taken as that given by Haidlen, and quoted by Mr. Horsfall. From this analysis, taking a full day's milk of a cow to be equal to 4 gallons, or upwards, of 40lbs., this would contain of solid matters:—

Casein or cheese, about	lbs.	2.00
Butter	1.25	
Sugar of milk	1.75	
Phosphate of lime . . . . .	.09	
Common salt and other saline matters	.11	
		5.20

Let us next briefly examine some of the recent researches which have been made as to the more profitable yield of butter, from the general result of which, we may safely conclude that a generous diet for the milch cow is the most beneficial to the dairy owner. On this question, Mr. Horsfall, of Burley, has produced most valuable evidence (*Jour. Roy. Ag. Soc.*, vol. xvii. p. 260); and this will well repay the careful consideration of the dairy owner of other districts, and where a widely different system of feeding is adopted. The food he bestows upon his cows, varying with the season, he thus describes:—

“My food for milch cows, after having undergone various modifications, has for two seasons consisted of rape-cake 5lbs., and bran 2lbs., for each cow, mixed with a sufficient quantity of bean-straw, oat-straw, and shells of oats, in equal proportions, to supply them three times a day with as much as they will eat. The whole of the materials are moistened and blended together, and after being well steamed, are given to the animals in a warm state. The attendant is allowed 1lb. to 1½lb. per cow, according to circumstances, of bean-meal, which he is charged to give to each cow in proportion to the yield of milk—those in full milk getting 2lbs. each per day, others but little: it is dry, and mixed with the steamed food on its being dealt out separately. When this is eaten up, green food is given, consisting of cabbages, from October to December, kohl rabi till February, and mangold till grass time. With a view to nicety of flavour, I

limit the supply of green food to 30 to 35lbs. per day for each. After each feed 4lbs. of meadow hay, or 12lbs. per day, is given to each cow: they are allowed water twice per day to the extent they will drink.”

The dairy cows of Mr. Horsfall are, it seems, purchased at the neighbouring markets. The breeds of this district, he tells us, have a considerable admixture of the shorthorn, which is not noted for the richness of its milk.

Before proceeding to describe the amount of cream and butter obtained from a given quantity of milk at different seasons of the year, and with varying kinds of food, he remarks:—

“In the summer season, whilst my cows were grazing in the open pastures during the day and housed during the night, being supplied with a limited quantity of the steamed food each morning and evening, a marked change occurred in the quality of the milk and cream; the quantity of the latter somewhat increased, but instead of 25 oz. of butter per quart of cream, my summer cream yielded only 16 oz. per quart.

“I would not be understood to attribute this variation in quality to the change of food only. It is commonly observed by dairy-keepers that milk during the warm months of summer is less rich in butter, owing probably to the greater restlessness of the cows, from being teased by flies, &c. I am by no means sure that, if turning out during the warm months be at all advisable, it would not be preferable that this should take place during the night instead of during the day time. Towards the close of September, when the temperature had become much cooler, and the cows were supplied with a much larger quantity of the steamed food, results appeared very similar to those which I had observed and described from December to May, 1855. During the month of November the quality was tested with the following result.

“From 252 qts. old milk were taken 21 qts. of cream, of which 20 were churned, and produced 468 oz. of butter, which shows:—

27.50 oz. of butter for 16 qts. of new milk.
23.40 oz. „ each qt. of cream.

“During May, 1856, my cows, being on open pasture during the day, were supplied with two full feeds of the steamed mixture, together with a supply of green rape-plant each morning and evening.

“The result was that from 324 qts. of old milk 23 qts. of cream were skimmed, of which 22 were churned and produced 515 oz. of butter, which shows:—

24 oz. of butter from 16 qts. of new milk.
22.41 oz. „ each qt. of cream.”

The very important question, in such enquiries, as to the condition of the cow under such a copious

produce of rich milk, is answered by Mr. Horsfall, when he remarks:—

“For some years back I have regularly weighed my feeding stock, a practice from which I am enabled to ascertain their doings with greater accuracy than I could previously. In January, 1854, I commenced weighing my milch cows: it has been shown by what I have premised that no accurate estimate can be formed of the effect of food on the production of milk, without ascertaining its effect on the condition of the cows. I have continued the practice once a month almost without omission up to this date. The weighings take place early in the morning, and before the cows are supplied with food. The weights are registered; and the length of time (15 months) during which I have observed this practice enables me to speak with confidence of the results.

“The cows in full milk yielding 12 to 16 quarts each per day vary but little—some losing, others gaining slightly; the balance in the month's weighing of this class being rather to gain. It is common for a cow to continue a yield from six to eight months before she gives below 12 quarts per day, at which time she has usually, if not invariably, gained weight.

“The cows giving less than 12 quarts, and down to 5 quarts per day, are found, when free from ailment, to gain without exception. This gain, with an average yield of nearly 8 quarts per day, is at the rate of 7lbs. to 8lbs. per week each.”

There is subject for valuable and extended enquiry in the remark of the editor of the Quarterly Journal, that “the *state* in which the food is given has a great effect in the production of both milk and butter. We have more than once observed,” he adds, “that the yield of butter and milk is never so great when we give cows boiled turnips, with beans boiled quite soft amongst them, as when they get the boiled turnips and the same weight of beans made into meal, and mixed raw with them. (This is the plan adopted at Burley.) And again, that there is more milk, and no taste of the turnip in it, when the turnips are pulped and mixed with cut straw and chaff, and fermented, than if the same weight of turnips are given whole and raw.” In this case boiling probably influences the condition of the albuminous portion of the bean. Dr. Lyon Playfair found, in his experiments upon the influence of different kinds of food upon the composition of milk (*Jour. Roy. Ag. Soc.*, vol. iv., p. 253), that beans increased the quantity of cheese

in the milk, whilst steamed potatoes caused an abundant increase of butter.

It is evident, indeed, that the quality and admixture of the food bestowed upon a cow is a most material, and often hardly well-understood element in dairy farming. The breed of the cow is commonly far more regarded than her dieting. The Alderney, the Ayrshire, the Holderness, the Kerry, and the Suffolk, are those which supply us with the greatest number of good milking cows—the Ayrshire being perhaps, as Mr. H. S. Thompson remarks, the true type of a milch cow for the production of *quantity*, and the Alderney for the *quality* of the milk. But then, as Professor Simonds adds in his valuable paper on the mammary gland of the cow (*Jour. Roy. Ag. Soc.*, vol. xix., p. 96), “It does not follow, as a matter of necessity, that a cow which yields a large quantity of milk shall be the best butter-making animal; for it frequently occurs that such milk has an increased proportion of water and casein, and is therefore relatively deficient in oleaginous matters: hence the practical remark, that ‘*quantity* for cheese-making, and *quality* for butter,’ is what we need.”

There is much in the paper of this eminent veterinarian which will well repay the study of the dairy-owner; and the same remark applies to the account given by Mr. Read in his prize essay of the celebrated butter-producing dairies of Aylesbury. It seems that there are in that district about 120,000 acres devoted to dairying, and about 30,000 cows dairied; so that supposing each cow to yield 200 lbs. of butter in 40 weeks, the annual amount of butter produced by the county would be about 2,680 tons. (*Ibid*, vol. 16, p. 269.)

On an early occasion I hope to add to these examinations other and still more valuable reports. I ever indeed regard with peculiar interest all efforts to increase the production of the dairy: it is a profitable branch of English agriculture, perhaps the least of any subject to be disturbed by foreign competition. It is true that foreign butter and beef are largely imported—say, on an average, yearly about 20,000 to 25,000 tons of butter, and about 7,000 or 8,000 tons of beef; but, then, the far greater bulk of these are salted. But a small proportion of really good fresh butter or beef comes into competition with the butter or beef of our islands. Our skilful dairy-owners, therefore, having a fair market for their produce, can far more securely rely upon being remunerated for their industry and excellent management, than from the produce of their most fertile corn-fields.

SUGGESTIONS FOR THE FUTURE CONDUCT OF PLOUGHING MATCHES.

We have been quite right hitherto in awarding prizes for good ploughing to the men. To encourage skill in the men was a very wise proceeding. For without good ploughing we cannot expect good crops, since our produce depends upon the fertile character of our seed beds, and these again depend upon the mechanical care we take to prepare them, turning an equal furrow of a regular angle, so that the arrow tooth may work perfectly; and when stretches are necessary, giving such an exact curvature to them as to shoot off the surface-water into the furrows.

To secure perfect work with the old swing-plough an exceeding skilful hand and quick eye are needed. These qualities acquired for the ploughman possessing them quite an enviable reputation in the village, and even the district where he resided. Many a master was proud to share in the reflected glory of his servant; and with the ploughman's success the village would rise and fall in the estimation of the villages surrounding.

The introduction of the wheel-plough, however, has very much changed the character of these trials, and the ground upon which prizes should be awarded. As the introduction of mechanical contrivance economises human labour and supplants human skill in those many manufactures for which Birmingham, Leeds, and Manchester are celebrated, so we find that as the mechanical perfection of the plough is increased, the necessity for skill in the ploughman is lessened.

This fact has been forcibly illustrated in most of those ploughing matches which occurred last autumn, where the prizes were almost invariably carried off by the ploughs, not by the men. When, as in former years, the iron wheel-ploughs were the exception, in those trials to which we refer the order was completely reversed—so much so, that we are speaking within bounds when we say that two-thirds of the ploughs employed were iron wheel-ploughs.

At not a few of these meetings it was suggested that there should in future be two classes—one for wheel-ploughs, and one for swing-ploughs; one, in fact, to test the merit of the men, another to test the merit of the ploughs. It was gravely argued that it was not fair to introduce at these meetings, which were established to reward skill in the men, ploughs which required no skill in the men, but merely the guidance of a child; and several incidents were mentioned in proof of this position. One case related was that of a boy, perched upon the middle team, driving three ploughs, jumping down to set them in at the ends only, while the men were quietly making a long breakfast under the hedge. At one of the matches we very well remember the complaints made against the manner in which the first prizeman won. While the plough was going, he would occasionally advance to adjust something wrong in the harness of the horses, or he would

fall yards behind to measure the depth of the furrow, just overtaking his charge in time to turn out at the headland. This, certainly, was not fair competition! The poor fellows who were sweating and toiling to preserve an equal and unbroken furrow under the singular disadvantage of an illconstructed mould-board and an unsteady beam, were fain to exclaim indignantly when they saw beside them better work accomplished with little or no effort.

The inference from all this is unavoidable. Machinery here, as well as elsewhere, economises and displaces human labour. And as we should not now offer prizes for mowing wheat when the machine is used, so we must cease to offer awards for skill in ploughing where skill is no longer requisite. Those persons who aim to solve the difficulty by instituting separate trials for the swing and wheel-ploughs, do not seem to have opened their eyes to the fact that the case *Swing v. Wheel-plough* is already settled quite another way by the very complaints out of which their difficulty springs. The argument that induces us to use thrashing, dressing, reaping machines, and horse-hoes, will also compel us, for very consistency's sake, to use the iron wheel-plough. The wooden swing-plough of a former day required more physical power to hold it than a stout lad could boast; but the wheel-plough of the present day is easily managed by a boy. And if we can employ boys, where is the logic in employing men? "But," say the advocates of the wooden plough, "we want a light plough, and the iron ploughs are so heavy." "Well," the advocates of the iron plough may reply, "they are heavy—heavier than yours in substance; but owing to their superior mechanical formation, nineteen out of twenty of yours will show by the dynamometer a greater strain, and a more various and trying strain upon the horses, than ours will. It is a curious fact that the draught of some of the iron wheel-ploughs, especially Howard's, is but one-third greater when the plough is in work than when it is empty, which, as we said before, is referable to the perfect curve of its mould-board, the greatest weight being lifted with the least possible expenditure of power. And this very substance, which is thus neutralized, admits of a plough, which is easy draught to two horses, being subjected to the stress of four or six, without any perceptible panting.

We may, by the way, refer to one of the greatest difficulties to the introduction of wheel-ploughs, which seems to lie in the prejudices of the men. We hear it said on every hand, "It's of no use my taking these ploughs home, because I'm sure my men won't use them." Nor is this a singular, but a very general exclamation. The superiority of the implement is recognized; but farmers cannot profit by it, because the men are adverse to its use. This confession is made, too, by good practical men—men of whom might be

expected better things. If we all followed this plan of making concessions to the prejudices of our men, we might be, so far as agricultural machinery is concerned, just about where the Russian farmers are. And these prejudices often arise from very peculiar sources. B., a local plough-maker, witnesses the introduction of a new plough with jealousy; and as he passes the field where it is working, he throws the ploughman a shilling, and promises another when the plough shall have been pronounced no-go. This verdict is soon practically passed. Many masters believe it true; some divine its true derivation; but the generality submit to it patiently, and wait for a better state of things.

Upon introducing the iron wheel-plough upon our own farm the same difficulties met us; but we were determined to inaugurate the improvement, and be master as much in fact as in name. Finding the men persist in not using the new ploughs, we employed boys, and have worked them with boys ever since, affording a lesson to the neighbourhood that will not soon be forgotten. If the men come to see that this is the alternative, and that they thus get worsted in the struggle for authority, they will discover that their interest does not lie in opposing the steps of mechanical progress.

This question set at rest, there is now another which arises for solution:

Which is the best corn-producing plough?

To reply to this question accurately, we must change the character of our ploughing-matches. They now test and reward the skill of the men; henceforward they must determine the superiority of the implements used.

Some little time since there appeared in the *Mark-lane Express* the report of such a trial, undertaken by the members of the Lauderdale Society, in the year 1856. We find, on referring to the report, that several of the best of the famous Scotch swing-ploughs were tested against two of Howard's patent wheel-ploughs. Something like one acre was allotted to each plough in the same field, the land being precisely identical. The work was done in February; the land was then harrowed and sown with oats, and was treated alike throughout to the harvesting and thrashing of the produce; periodical observations were made and recorded, as to the relative appearance of the different strips; and, finally, the produce of these plots was separately harvested, thrashed, measured, and weighed—straw, grain, and pulse.

There is a great amount of incredulity upon this point. The instances are not common in which farmers believe there to be any difference, as to produce, from the use of any particular plough. And, if they do not deny the fact of any difference in the result, they maintain that the difference is so inappreciable as to be not worthy of regard. Such facts as appear in the appended table must tend to shake the foundations of this preconceived belief, and to show that not only may one plough surpass another in economizing human labour and brute force; but also that one plough may actually, by its mechanical superiority, prove itself a better producer of corn than another. Neat work is not essential to us, but plenty of corn is.

To ensure truthful results, these trials should, from beginning to end, be carried on with the strictest regard to accuracy and impartiality. The land must be of the same character, and its treatment throughout the several plots identical. During the ensuing autumn or next spring will it not be well to institute these tests? There may be difficulties in the way; but the difficulties that so often infest a right course should never prove sufficient excuse for our not pursuing it. The example furnished by the Lauderdale Society opened the eyes of the Scotch to an important fact, and they have been found very ready to profit by the teaching given to them. We are open, I hope, to the same conviction.

In closing these suggestions, we may remark that we by no means aim any blow at our Benefit Societies. We shall be in a better position even to maintain their funds: the only change introduced will consist in a little difference in their distribution. It is not our opinion that machinery is the labourer's enemy, but the labourer's friend, lessening the severity of toil. England could never have accomplished her work of civilization in the world had not machinery increased her treasure, and set free a large portion of her population. On this head at least, then, we need not grow very sentimental; and though we entertain some fears, to which we shall at some future time give expression, with respect to the danger, from excessive manufacturing, of creating an evil inimical to any nation or namely, of great cities—we do not think the employment of the best corn-producing plough likely to hasten this state of things.

TABULAR STATEMENT OF PRODUCE ON ALLOTMENTS COMBINED.

Nos.	Name of Plough and Furrow cut.	Square Yard,	Per 2 Acres; Straw,		Per 2 Acres; Oats in 2 Plots.	Total, Oats & Straw, &c. &c.	Oats in Bushels of 42lbs. each, per 2 Acres.
		the 2 Plots.	Chaff, and Loss in 2 Allotments.	lb.				lb.
		yds.	lb.	lb.	lb.	bu. lbs.	
1 & 6.	Small's ploughs, deep	8176	10695	5512	16207	131 17	
	Yester ploughs, deep	8256	9702	4908	14610	116 36	
	Currie ploughs, high-crested furrow . . .	5369	10358	5143	15301	120 3	
	Howard's ploughs, rectangular furrow . .	5260	12358	5533	17911	132 9	
	Small's ploughs, rectangular furrow . .	5300	11028	5204	16232	123 33	

WEATHER WISDOM. — "The late Marshal Bugeaud," says the *Emancipation* of Brussels, "when only a captain, during the Spanish campaign under Napoleon I., once read in a manuscript which by chance fell into his hands, that from observations made in England and Florence during a period of fifty years, the following law respecting the weather had been proved to hold true:—'Eleven times out of twelve the weather remains the same during the whole moon as it is on the fifth day, if it continues unchanged over the sixth day; and nine times out of twelve like the fourth day, if the sixth resembles the fourth.' From 1815 to 1830, M.

Bugeaud devoted his attention to agriculture; and, guided by the law just mentioned, avoided the losses in hay, time, and vintage, which many of his neighbours experienced. When governor of Algiers, he never entered on a campaign until after the sixth day of the moon. His neighbours at Excideuil and his lieutenants in Algeria would often ex-

claim, 'How lucky he is in the weather!' What they regarded as mere chance was the result of observation. In counting the fourth and sixth days, he was particular in beginning from the exact time of new moon, and added three-quarters of an hour for each day for the greater length of the lunar, as compared with the solar day."

THE PROFESSION OF AGRICULTURE.

IPSWICH FARMERS' CLUB.

The first meeting of the members of this Club took place in the large room of the Golden Lion Inn, on Tuesday, May 17, There was a very large attendance, with Mr. M. Biddell in the chair.

Mr. R. BOND, of Kentwell, read a paper "On the Profession of Agriculture, practically and politically considered," from which we give the leading points. Mr. Bond, having congratulated the meeting on the formation of the Club, thus proceeded:—In treating this subject, I will not forget the pounds, shillings, and pence considerations, and I propose to answer the following questions, viz.:—What is the actual per-centage position of agriculture? Can the position of agriculture be improved socially in the relationship of landlord and tenant? Can it be improved politically? Can it be improved practically by improved practice? First, What is the actual per-centage position of agriculture? I believe it is an allowed fact, of which we are all well aware, that agriculture, though a pleasant and agreeable business, is one from which the average per-centage profit is comparatively small. Whither I shall turn to meet with agriculturists of equal proportions as corn or cattle lords—whither I shall turn to find fabulous hoards of wealth derived by the cultivator from the cultivation of the soil, is a task in which I must ask your assistance. I know of but few such cases. Agricultural accumulation is usually a slow game of patience, and although there are many men who are well to do enough, and possessed of ample capital as tenant farmers, yet I much question whether one agricultural lord can be found who has risen to fortune and an exalted position in society by the large per-centage returns of his agricultural investments. Again, gentlemen, if we leave the extremes of success, and descend to the medium indications of prosperity, what do we find? Who retires from the toils and the struggles of business crowned with success, to spend an old age of competency in the quiet and peaceful enjoyment of that wealth which years of labour have accumulated? I know the country life of a farmer militates against such a course; but with all due allowance, the retirement of successful tradesmen is comparatively beyond all proportion—it is as 100 to 1. The thought of a farmer retiring almost excites an involuntary smile, and I am convinced that in 99 cases out of 100, this charitable world of ours would pronounce it to be from necessity, and not from choice. Upon agricultural prosperity, or the want of it, I may even say more; I may venture the assertion that there are thousands of painstaking, careful, business men throughout the kingdom, who, in the average of years as farmers, make no progress; their per-centage affords them a subsistence, but not an accumulating surplus; year after year their position is one of stagnation rather than of progression. Now, gentlemen, why is this? I have taken some pains to inquire; and, first, as to trade, I have corresponded largely with friends and gentlemen to ascertain the average per-centage returns from the various trades and manufactures, both in town and country, and whilst I can find, from the most reliable sources, that money thus invested pays a per-centage vary-

ing, according to the nature of the business, from 15 to 25 per cent., agriculturally the return is not 10 per cent., inclusive of personal supervision. Now, gentlemen, why is there this marked difference, and why is it that capital invested agriculturally does not make a better return? The truth is, competition explains the whole secret. The competition is extreme. The truly agricultural class would compete for farms as a business investment and as a business occupation; but the wealthy tradesman, on behalf of himself or his son, competes in part to secure the recreation and advantage of green fields and fresh air; and although to such capitalists per-centage return is generally a secondary consideration, compared with the freedom and comfort of a country life, yet trade usually competes in ignorance, and under the false notion that agricultural profits range high. Gentlemen, too, farm for amusement, and when business as a pleasure competes with business as an investment, it increases the competition at heavy odds, and greatly tends to reduce the per-centage returns. Did you, gentlemen, at any previous period know of such competition for farms as at the present moment? Thus, gentlemen, independently of farming being a pleasurable business, which greatly induces competition, we have increasing wealth, increasing population, and a limited supply of land, all assisting to add to the competitive demand. I fearlessly assert, from investigation and comparison, that agriculture is the most competitive business pursued. But to the honour of the landlords of England it may generally be said that competition is not allowed to work to its utmost extent. I believe in cases where the good mixed soil pleasurable farms of the kingdom have been thrown into the market, and let by tender to the highest bidder, not 1-3rd per cent. is the annual return, which, after allowing for the tenant's supervision, makes the investment a heavy losing speculation. Upon the present basis, and the present position of matters, I urge the fathers of England to pause before they determine to import their sons by wholesale into a business low in its per-centage returns, and whereby already the actual and the expectant farmers are ready to cut up the present pecuniary profit by an overwhelming competition for land.

"Can the position of agriculture be improved socially, in the relationship of landlord and tenant?" I am of opinion that the relationship of landlord and tenant may be materially improved. Such an improvement would be mutually advantageous; and it is my conviction that the improved cultivation of the kingdom at large materially hinges upon the just settlement of this question. I observe that tenant farmers employ the largest invested capital of any class in England, and I cannot understand the justice or the propriety of withholding from them just protection to their investments. I know it may be said, "Why, what can be done? it is a delicate and difficult subject, and you cannot interfere." Now I have no wish to interfere, in the ordinary acceptance of that word, but I have no sympathy with such placitude. I have no sympathy

with such inaction. Show that a pressing necessity exists, and I believe we are the men to grapple the more resolutely with the difficulty, rather than allow real and imaginary obstacles to deter us from exertion. Would a surgeon decline to adjust a limb because it was a compound fracture? and shall we decline to adjust a difficulty because it is a compound question? There is a necessity—there is a need of remedy; and I have that high opinion of the honour and nobility of the landlords of England, that I believe, if properly asked, they would be the first to accord their consent to a proposition of justice and fairness. This has been my experience of their everyday bearing; but the necessity must be proved. Then to illustrate the point: the unprotected improving tenant's position is precisely that of a capitalist who obtains leave to build, and actually builds a house at considerable cost, upon another man's property, without first obtaining a building lease. The capitalist unexpectedly receives notice to quit his newly erected residence, from which he has derived no benefit; but as he has no agreement to retain possession, to sell, or to receive an equivalent, he leaves his one, two, or three thousand pounds in the household property to the quiet enjoyment of the owner of the soil. Now tenant farmers don't require to build houses, but they do require to invest hundreds and hundreds of thousands of pounds in improving their occupations by draining, marling, deep ploughing, manuring, and by these and other improved modes of culture, to increase the fertility of their occupations some twenty, thirty, forty, or fifty per cent. It is greatly to the interest of the tenant farmer to improve his holding; but to improve and then to receive notice to quit, without obtaining an equivalent for the capital invested, is simply to leave to the quiet possession of the owner of the soil a large proportion of his (the tenant's) rightful property. Now, it is to protect the tenant farmers of England from such casualties that I desire to see a friendly adjustment. Business transactions may not hinge upon words of honour. Nought but legal security is true security. The present ancient custom of the country is no real protection. I know it may be said that acts of injustice, whether arising from death, change of ownership, or from private or political caprice, are rare. Now, to my knowledge such instances are not uninfrequent. Were they as recurrent and as abundant as blackberries in autumn there would be an end to all tenancy holdings; but it is a fact, that tens of thousands of pounds are thus annually and wrongfully sacrificed! and the whole subject calls for serious consideration and a fair and equitable arrangement. Investments and improvements in agriculture are nearly synonymous terms, and without protection to capital the result must necessarily be—limited outlay, retarded progress, and a curtailed national yield in produce. How detrimental is such restricted outlay to the best interests of the landlord as well as the tenant! What has made the Holkham estate the agricultural pride of England, and the admiration of every visitant foreigner? Certainly not doubt and distrust in the relationship of landlord and tenant—certainly not restricted outlay and stinted protection to capital, but a wise and liberal-minded policy on the part of the landlord, and spirited outlay from a spirited (because a secure) tenantry. Through the Earl of Leicester's excellent and much respected agent (Mr. Keary) I have his lordship's permission to state that, within the past half century, the entire Holkham property has increased in rental value to the enormous amount of upwards of 50 per cent. I will simply leave this important fact to the consideration of the landlords of England. I trust they may see that liberality of sentiment and liberality of action are not without their personal and pecuniary rewards.

In the agreements between landlord and tenant, the

general failing is extreme protection to the landlord, in undue stringency; and no real protection against bad farming and mis-management. In hiring a farm, I would decidedly and willingly pay more money as rent for the advantages of farming as I pleased, without being placed under legal tutors and governors in my cultivation, and at the same time I would freely consent to the agreement that the farm should be improved and not impaired at the expiration of my tenancy. The more I could make from my occupation, the more could I afford to pay to my landlord as rent.

I now arrive at that much vexed and delicate question—Game. Upon the present indefinite system as to the amount of game to be kept, and the amount of damage to be incurred by the tenant farmer, it must ever remain a most trying, vexatious, and perplexing question. I know it may be said a landlord has a right to do as he pleases with his own; this I freely accord; but it must be remembered that though the soil belongs to the owner, the crop is the property of the occupant, and under such circumstances the only just course to be pursued is fairly to fix the amount of damage to be borne by the tenant farmer at £5, £10, £50, or £100 per annum, as the case may be, and all increase of such damage to be paid by the landlord. Such an arrangement makes the agreement clear and distinct; it puts aside all mistrust; it places the burden upon the right shoulders; the tenant knows his obligation, the landlord his liberty to keep any amount of ground or wing game he pleases, without a murmur from the tenant as occupier; more rent, under a reasonable arrangement, can fairly be demanded and paid; and in different cases I have seen this arrangement work with perfect justice and satisfaction. It has been my good fortune, in some instances, recently to insert such a game clause in different leases, and I believe in each case it will work to the mutual advantage of landlord and tenant. I long to see this question clearly and definitely settled generally, and I invite owners and occupiers to meet the difficulty in the spirit of honourable and open-handed justice, and not to arm might against right, but to place their relationship upon the true principles of just responsibility and definite agreements. It was my pleasure recently to have the opportunity of inspecting the Duke of Grafton's Euston estate, in Suffolk, which is under the able agency of my friend, Mr. G. Kersey Cooper. Amidst general first-class management and first-class farming, nothing struck me more forcibly than the fact that, though a large light-land property containing upwards of 15,000 acres, no injury is done by hares or rabbits; they are kept well under; yet the sporting is excellent, pheasants and partridges abounding, and, at the same time, the rent roll is undoubtedly from twenty to fifty per cent. higher than if the crops in the fields, and the underwood in the plantations, were partially destroyed by ground game. Thus, sport and a large rental return are alike secured; the landlord avoids continual annoyance, and the tenantry are happy and contented.

Can the position of Agriculture be improved politically? There are legislative and fiscal regulations which materially affect the per-centage returns of agriculture. I allude, more especially, to the malt-tax, which, I believe, curtails the growth of barley, lessens its price, lessens its consumption, and is a positive detriment to the profits of farming. I have always supposed that supply and demand controlled the price of every commodity, and how a heavy duty which materially checks consumption, which vastly increases adulteration in the substitution of drugs and other deleterious

rious ingredients for malt; I say how these obstructions to our enterprise, and how the burden of a heavy tax upon our produce (though paid if you please by the consumer), I say how all these advantages are blessings rather than curses, I cannot for the life of me conceive.

I believe, too, that this question of the malt-tax is of unusual importance at the present time; for in times of peace, it is quite clear, we can much more effectually compete with continental nations in the articles barley and meat, than we can in the production of wheat. Wheat is of universal culture, while barley is restricted to localities. We can produce barley to perfection in the eastern counties of England; and we naturally desire an increased demand and increased price, that we may partially substitute barley for the culture of wheat; and as it is, practically speaking, a less difficult, a less expensive, and a less exhaustive crop to produce than wheat, the abolition of the malt-tax would be of signal service to the barley-producing districts. Again, why, if ordinary malt as a condiment in these straw-consuming days would be useful in growing meat, or if for fattening purposes it would act as a stimulant in the manufacture of beef or mutton, why should it not be freely used? We are unjustly debarred from availing ourselves of its advantages.

Again, why should the beer of the man we employ—the poor man's especial beverage—be oppressively taxed? Government may pronounce beer a luxury; but to me it is perfectly clear that to the poor man, with his difficult weekly practical problem to solve—with his wife, children, and himself to be maintained upon his 8s. to 10s. a week—beer is a necessary comfort rather than a superfluous luxury. Tax wealth, tax competency, tax the luxuries of the great and the luxuries of the middle classes; but, in fairness and honesty, spare the essential comforts and the necessities of the poor: for if we cannot alleviate their lot, let us scorn to increase artificially their burdens. The malt-tax is unfair, as restricting agricultural profits; it is unjust, as taxing the beer of the man we employ—the poor man's especial beverage; and it is immoral in its tendency, acting as a premium upon nefarious adulteration. As an important barley-producing county, we require to take a very prominent position upon the malt-tax question: it is for us to lead in the battle, and fight it to success; and I am glad to be able to say that Major Parker, the newly-elected member for West Suffolk, recently informed me of his resolve to stand up for the abolition of the malt-tax with indomitable perseverance. I trust Lord Henniker, Sir Fitzroy Kelly, and other county members with constituencies interested in the cause, will join in one united phalanx to support it. It must fall. Why, as an indication, only during the late reform debate, Mr. Drummond and Mr. Bright were each accusing the other as being by party the preventive to the passing such a measure, whereby it was perfectly clear they were both willing to acquiesce in its abolition. In Kent, I am glad to observe, large meetings, to the number, upon some occasions, of 3,000 persons, have occurred, to agitate the repeal of the hop-duty. I heartily wish them success; and I trust gentlemen in the barley-growing districts, and the community at large, will not lack the necessary public spirit to suppress the malt-tax, which is specially unfair as a special tax upon agricultural enterprise, and specially unjust as a tax upon the poor man's especial beverage. I pass over other subjects which would properly rank under the heading of "agricultural politics." I think our political force needs concentration; and the most desirable point upon which first

to combine and try our power is the abolition of the malt-tax.

I now arrive at the consideration of the last question proposed, viz., can the position of Agriculture be improved practically by improved practice? I observe the pasture farming in this county is grievously defective; I see that in these atock-paying days we are losing one chief source of profit; our pastures are producing but a third of their capabilities both in quantity and quality; they are producing comparatively nothing in milk, meat, or wool. We all know that they ought to be a capital source of revenue. We all know how much we prize pasture lands. When we want to hire a farm, do we not anxiously ask "How much pasture?" and we all know how sadly we in general mismanage them. I am speaking in a sweeping manner, but I see but few exceptions to the general mistake; and I know, gentlemen, you will agree with me in the assertion, that good management of pasture lands is the exception, and not the rule. I seldom see the dung cart in the pasture field, with its liberal supply of manure, repaying the annual extraction of hay, beef, and mutton, from the soil; but I see a yearly erroneous system of exaction and robbery. Upon the cold clays we have arrived at the minimum point of production, and I can plainly perceive we have come to an important period when something must be done. And what must that something be? It requires to be no partial measure; upon much of the cold clays and upon some of the moss-poisoned mixed soil, attempted renovation must be a slow and tedious remedy—they want to be broken up *in toto*, and the old natural starved-out grasses supplanted by modern grasses of a very different quality. Why, only last month I was examining a pasture thus treated, and the occupier informed me that in the second year after its breaking up, in that one year it had produced more grass than in any two years previously. I believe that breaking up and re-laying, followed by fair and reasonable manuring, would, in the course of years, yield 30 per cent. per annum upon the outlay. There is no necessity for me to tell you that breaking up and re-laying pasture land is no joke; but I am convinced, in many cases, it is the best course to pursue, yet no tenant is justified in risking such an expense without security. The other day I found a friend improving his pastures 300 per cent., at a heavy cost, as you may imagine. I said "You have a lease, of course, or a clause for the payment of unexhausted improvements upon quitting?" He replied "I have neither one nor the other, and I may have notice to quit my farm, and be compelled to leave the entire capital sunk, without receiving a farthing as an equivalent; or an increase of rental may at once be demanded, in which case quit or pay will be my poor choice of alternatives." I hold also the opinion upon the subject of breaking up land, that the time has now fully arrived when the larger proportion of our uncultivated heaths in Suffolk will, if allowed to continue as such, be a disgrace to Suffolk enterprise; and though I have the notion that making such lands stock-producing rather than corn-producing would be the best course, yet I believe, with judgment under either plan, they would amply repay the tenant for his outlay, while after the expiration of a thirty years' lease the land would be found to have increased in value 200 per cent. I should not desire a better investment than to purchase some of such heath lands as freehold, at twenty-eight years' purchase of their present rental. I believe we are asleep upon this point, for with the increased demand for land, the prevailing anxiety for stock farms, the increased value (relatively) of sheep stock and of barley, the discovery of artificial manures, the ease by which such heath lands can now be brought into cultivation by the steam plough, these facts have totally altered their position; and it is most undesirable that such

barren spots should continue as deserts in the midst of fertility. I have a great idea that with the blessings of peace the comparative luxuries of life—as meat, butter, barley, and wool (for broad cloth) will be much higher in value relatively than wheat (the positive necessary), and that we must adapt our course accordingly. With dear meat we require abundant grass, and much may be done to secure this by improved pasture-farming. Without breaking up or relaying, our pastures might be as luxuriant as our root crops; but whilst we strain every nerve and dive our hands deep into outlay to produce the mangold, turnip, or swede crops, we do not invest one sixpence in manure to secure abundant grass crops. Perhaps we feed and mow alternate years; but the principle is bare-faced robbery, for the mown crop is bodily removed and the fed crop partially, as the animal manufactures meat therefrom and perhaps milk in addition; consequently the whole system is erroneous, and has brought us through a long course of years to our present undesirable position—poverty in our pastures and paucity in our stock. Upon the subject of arable meat produce I have in another place and upon a former occasion, expressed, and I now repeat my conviction, that in this and the adjoining counties we have erred in principle and in practice, in the average of years, by too expensive a system of bullock grazing; that we have bought our lean beasts at too dear a rate for profit; that under altered circumstances we have too much adhered to old past fattening principles, and we have too much adhered to exploded and expensive methods of manure making, to the partial neglect of cattle and sheep rearing. I have also previously expressed my belief that more might be profitably done in lamb rearing on heavy land, and I now express my opinion that more may be done in sheep-breeding and fattening on light and mixed soils. I know well that at the current prices for lambs, mutton, and wool, it is well worth trying, and I am certain those will be behind in the pecuniary race who do not make the attempt. To show you I speak not simply from my own experience, I will relate the practice of a gentleman in West Suffolk, giving you full particulars and the result of his long experience. I visited him last month, in company with Mr. Kersey Cooper, Mr. Mumford Sexton, Mr. W. King, and Mr. Bate; and whilst these gentlemen, with myself, were equally pleased with the first-class condition of the lambs, and the healthy and satisfactory appearance of the ewes, they were at the same time equally astonished at the large number of sheep kept to so small a proportion of land. He farms 260 acres of very good friable loam clay-land, of which only about twenty-five are pasture, and, by gradually increasing his stock yearly, as lamb-rearing has promised to pay, he now annually keeps from twenty to twenty-one scores of ewes, and each year the fall of lambs has been large: this year exceeding thirty to the score. Of course the wonder is how so many are maintained, and the supposition follows that much artificial food must be used. The annexed account of expenses and returns is copied from Mr. F.'s balance-sheet:—

1857.		1857.	
EXPENDITURE.	£ s. d.	RECEIPTS.	£ s. d.
Artificial food . . .	66 0 0	400 lambs, at 2s. .	400 0 0
Outkeep in summer	55 0 0	100 lambs, at 2s. .	110 0 0
Annual loss of 10 ewes, & the amount expended for 60 shearling ewes after deducting the value of crones	70 0 0	18 lambs, at 1s. .	12 12 0
Amount realized for farm produce consumed by flock. .	535 18 0	3 fat	5 2 0
		Wool.	119 4 0
	<hr/>		<hr/>
	£72618 0		£726 18 0

The value of the manure is placed against the labour.

Now how is this vast practical result annually accomplished? How are the sheep fed? The secret is, the yard and straw system. The ewes are mainly fed during the winter months upon fresh-thrashed barley or oat-straw placed in bins, and some cut into chaff, with which is admixed trefoil husk when procurable, and, previous to lambing, some millers' offal is given. They have also, about four Scotch cart-loads of turnips each day.

For the spring feed, rye and Italian rye-grass are grown upon the fallow shift, previous to sowing for the turnip crop. Cabbages are also grown, and the clover layers are usually fed.

Of course it would appear probable that the whole farm must be given up to sheep husbandry. Now such is not the case; and upon the 8th of April, 1859, I recorded the present position of the farm as to its cropping. It is as follows:—

Acres.	
49	wheat;
55	barley;
24	peas and beans;
12	white clover fed in spring, and to be saved for seed;
16	red clover fed in spring, and to be saved for seed;
15½	Italian rye-grass, ditto ditto;
10½	sainfoin, to be reserved for hay;
1	cabbage seed;
2	oats, after cabbages;
41	fallow { 16a. for mangold wurtzel;
	{ 8a. Italian rye-grass, after feeding for swedes, turnips, or kohlrabi;
	{ 6a. winter oats, ditto, ditto;
	{ 3a. rye, ditto, ditto;
	{ 3a. tares, ditto for cabbages;
25	pasture;
8	waste.
<hr/>	
259	acres.

Thus 130 acres are with corn, 44½ for seeds, 10½ for mowing; consequently, nothing more than the fallow shift is specially set apart for the flock, and although the clovers and Italian rye-grass intended for seeding are first fed, it is not at all clear to me, at the present market price of seeds, that such a course is not much more paying than growing wheat at 20s. per coomb. I am convinced it is more profitable, and ample food is thus provided for spring consumption for the lambs.

Thus, straw and a few roots, with slight artificial additions, suffice for the first three months after tupping; then cabbages are added as lambing proceeds, and then the Italian rye grass and clovers. After the lambs are sold, the ewes are put out to keep for two or three months, and after the Italian rye grass has seeded, rape is sown, upon which the ewes are fed during tupping.

Now, Gentlemen, I said I believed it possible, and paying, that more sheep should not only be kept upon heavy clay lands, where hitherto they have been comparative strangers; but then I also believe it desirable more should be kept upon the mixed soil and poor light lands.

It was my intention to have made some observations upon the desirability of growing more seeds generally; upon the desirability of using the liquid manure drill to ensure a turnip plant, and the superior efficacy of the manure thus applied; upon the great improvement in drilling instead of sowing clover seeds; upon the important position which barley will probably take in the market, and its extended culture; upon steam ploughing and extended autumn cultivation; and upon the desirability of adopting some systematic plan of stack dressing, to prevent serious losses from vermin; but time fails me, and I will briefly recapitulate. I have shown that, owing to extreme competition, more especially for the hire of farms, the

per-centage returns of farming are small. I have shown that trade, though less pleasurable, is more profitable. I have shown that, in agriculture, profit within the last three or four years has varied greatly upon poor clay lands, and good stock and barley farms. I have recommended that until just security is given, whereby a largely increased amount of capital can be invested in improved culture upon a given area, that agriculturists and tradesmen generally should mutually pause before they determine to import their sons largely into a business, not only low in its per centage returns, but in which competition is already extreme, and investment is artificially restricted. I have shown that the social relationship of landlord and tenant may be improved, to the mutual advantage of each party, by giving security of tenure, or security to outlay, by liberal covenants, by protection from game where liable to serious damage; by fairly meeting the building and other requirements of the farm, and considering it solely as a meat and corn producing manu-

factory. I have shown that the political position of agriculture may be improved by conceding the repeal of the malt tax; and I have insisted that though the existence of such a tax is unfair in principle and unjust and injurious in its action, its removal must depend upon our exertion. I have alluded to the hop duty, but I have passed over other subjects of agricultural politics, considering we need to concentrate our labours upon securing the entire abolition of the malt tax. I have shown that our practical position may be improved by improved pasture farming, by keeping a larger number of sheep, by consuming more straw, by partially giving up the exploded system of expensive manure making, by unpaying fattening, by pursuing and practising the most paying course regardless of system, by growing more clover seeds, and seeds generally, whilst other subjects I have been compelled to pass over for the want of time.

A short discussion followed, and the proceedings terminated with a vote of thanks to Mr. Bond.

ROYAL AGRICULTURAL IMPROVEMENT SOCIETY OF IRELAND.

The half-yearly meeting of the members of the above society was held on Thursday, May 19, at the Farmers' Club, Upper Sackville-street. His Grace the Duke of Leinster in the chair.

The Secretary read the half-yearly report as follows:—

“Your council beg to submit their half-yearly report, ending 19th May, 1859, together with the usual abstract sheet, duly audited, showing the receipts and disbursements of the society for the year 1858. The balance appearing against the society is, no doubt, large; but it will be observed that it is not attributable to any falling off in the annual income, but is mainly owing to the unusual heavy amount paid under the head of premiums, being in excess over the payments made under the same head in 1857 of £458. The expenditure under the head of incidentals shows some extraordinary payments, viz., a donation of £100 to the Royal Dublin Society towards the erection of their Agricultural Hall, and a payment to Professor Simonds of £89, being the proportion payable by the society in conjunction with the Royal Agricultural Society of England and Highland Society of the expenses incurred by that gentleman in investigating and reporting on the cattle plague in the early part of last year. From the satisfactory manner in which the subscriptions for the current year are being paid, your council have been enabled to clear off this balance, and after a careful examination into the probable receipts and disbursements up to the 31st December next, they anticipate that there will still be ample funds to meet all demands. The prize sheet for the society's annual cattle show, to be held this year in Dundalk, has been carefully revised. The most important alteration to which your council beg to draw attention has been the withdrawal of prizes for implementa. ‘The Farmer's Gazette Challenge Cup’ is still offered for competition, but it is optional for the implement exhibitors to enter for this prize. This step your council considers a prudent one, and will not affect the entries in the implement department at Dundalk. The period for holding the show has been changed from the middle of August, the time when your meetings were usually held, to the last week in July. This

alteration will enable the practical farmer, unshackled by harvest operations, to attend, and also much assist your council in obtaining judges. Your council have much pleasure in reporting that the arrangements for the society's show are progressing most favourably; and, from the energy displayed by the local committee, a most successful meeting may be anticipated. The prize sheet for local farming societies has been revived, and some useful and practical amendments made. The society's gold medals offered by your council for labourers' cottages were competed for by two in Ulster, four in Leinster, and one in Connaught. There was no competitor for Munster. Experienced judges were appointed to inspect and adjudicate, and their several awards, together with very ample and interesting reports, embodying the plans, specifications, &c., of the prize cottages, have been published in the annual report. Your council have renewed the prize for the current year, and have also offered the society's gold medal for competition, in each province of Ireland, for the improvement of previously existing cottages; and they earnestly trust that the efforts of the society to raise the condition of the agricultural labourer will be heartily responded to, and that each county will send a competitor. In accordance with the resolution passed at the special general meeting, in February last, the rules for the governance of the society are submitted for adoption, the several amendments passed at the last two general meetings of the society have been unanimously agreed to, the following addition to the nineteenth rule being the only new motion inserted: ‘Provided also, that when any such new rule is intended to be proposed at a general meeting, a month's notice of such new rule be given to the secretary, who shall publish the same by advertisement in the newspapers. Provided, further, that no new rule be adopted at a general meeting, unless twenty members of the society shall vote for it.’ In conclusion, your council feel justified in congratulating the society at large upon its continued progress, and upon the increased favour with which its operations are viewed by the public.—By order,

“J. M. ROYSE, Secretary.”

The report was agreed to unanimously.

THE CABBAGE AND ITS USES.

Our special department being the diffusion of useful hints and practical information relative to the products of the soil, we have gathered together, for the benefit of our readers, a few notes on the cabbage tribe. They are applied to a greater number of purposes than many would suppose, and afford an addition to food in a great number of forms, ages, and parts of the plant. The roots, the leaves, the stems, and the buds of the cruciferous esculent are eaten raw or dressed in various ways, and the seeds of many species are valuable on account of the oil which they afford.

Many a good stout cudgel and serviceable walking-stick is furnished by the stem of the great Jersey cow or tree cabbage. In the northern departments of France the longest of the stalks are used for supporting kidney beans and peas, &c., and also as cross-spars for the purpose of supporting the thatch or roof of the smaller class of farm-buildings, cottages, &c., and when kept dry are said to last upwards of half-a-century.

The poet Burns alludes to the castocks, or cabbage stems, which, after the fibrous part was picked off, were boiled and eaten. Before the introduction of the turnip into general use in Scotland, this medullary substance of the stalks was very commonly eaten by the peasantry, while the outside portion was given as a dainty to the favourite milch cows.

Few of our culinary plants have been more improved and extended by culture than the cabbage and its varieties. The effect of careful cultivation, improvement, and election of the most deserving varieties on many of our cultivated economical plants shows how much may yet be done by experimentalizing on new tuberous roots and other esculents. Nor can a more suitable example be adduced than to compare the insignificant weed-like original cabbage plant on the cliffs of our sea-coast with the gigantic tree or cow-cabbage, the large close-head of the drum-head cabbage, or with the different forms or habits of growth apparent in the Brussels' sprouts, red cabbage, thousand-headed cabbage, cauliflower, kohlrabi, and numerous other varieties.

"Much," observe Messrs. Lawson and Son, "has been said and written recommendatory of the cabbage tribe being more extensively subjected to field-culture in this country, for feeding cattle, sheep, swine, and even poultry; but judging from many trials which have been made, as well as from the natural habits of the whole tribe, their culture seems only likely to be attended with any chance of advantage on the most superior class of soils, particularly on such as are of rather strong texture, and where an abundant supply of manure can be had; and even in many such cases it is questionable how far they ought to be preferred to turnips, over which, however, they possess the advantage of improving rather than deteriorating the quality of the milk of cows fed upon them, and also of growing freely on lands which are too stiff in texture for the

growth of any sort of turnips." The extent of land under culture with cabbages as a field crop in the United Kingdom is very inconsiderable. In Scotland there were in 1857 1,704 acres, in Ireland 30,011 acres, and in England and Wales about 97,334 acres with cabbages and a few other small green crops.

Arthur Young wrote that an average crop of cabbage on a dry soil was about 36 tons, and on a sandy soil half that quantity. But, although 30 tons per acre are often grown by good cultivation, yet few crops reach to that extent, and in Ireland the average yield is scarcely 15 tons the acre. As a pot-herb, cabbages, broccoli, &c., are in considerable demand, whether it be the Brussels sprouts, esteemed for their tenderness and good flavour; the savoys, with firm heads, and the best winter cabbage for family use; the solid heavy drum-heads; the sugar-loaves; the red Dutch, for pickling and for salads; the early cauliflowers, &c. Ten years ago, Mr. Braithwaite Poole, in his Statistics of British Commerce, estimated the weight of these vegetables brought annually into the London markets at 80,000 tons of cabbages, 32,000 tons of broccoli, and 4,150 tons of turnip-tops. Single growers will sometimes send up to one salesman in Covent Garden market seven or eight waggon loads of cabbages daily, each comprising a hundred-and-fifty dozen. There are many others besides Dr. Johnson who think the cauliflower the best of all the flowers sent to Covent Garden.

When Ray made a tour along the eastern coasts of the kingdom in 1660, after describing the wretched system of Scottish agriculture, he goes on to say: "They have neither good bread, cheese, nor drink. They cannot make them, nor will they learn. Their butter is very indifferent, and one would wonder how they could contrive to make it so bad. They use much pottage, made of colewort, which they call 'kail,' and sometimes broth of decorticated barley." We cannot help sympathizing with the unfortunate traveller when introduced to such a bill of fare as the natives of the North seem to have indulged in. We can understand his discomfort at the taste and quality of cabbage-soup, oaten cake, and barley-brae, and are not astonished to find that their agriculture generally was then at the low ebb the system of living starvation seems to imply. The kail-brose was then made with oatmeal: it was barefit kail or water kail. But the kail-brose or kail-kennin of the present day is an improvement upon by-gone broths.

The "Kale Brose o' auld Scotland" is celebrated to the same tune as the "Roast Beef of Old England," and though, with many of the ancient peculiarities of the people, it has fallen much into disuse, it is still considered a national dish.

Cabbage soup is, however, a very common dish in many countries. "*Minestra verde*"—greens boiled in plain

water with a small lump of lard—is eaten by the poorer classes of Neapolitans, who cannot afford macaroni.

It is a joke in some of the foreign provinces of Russia, that the three mightiest gods of the Muscovite are Sshin, Tshai, and Shtshee—that is, rank, tea, and cabbage-soup. In fact, this same shtshee, or cabbage-soup, is the staff of life, from the German frontier to Kamstchatka. Russian soldiers—hear it, ye Britons, who feed on beef!—are nourished mainly on this cheap, and, we should deem it, innutritious food, which is thus compounded: Six or seven heads of cabbage are chopped up, and mixed with half-a-pound of barley-meal, a quarter of a pound of butter, a handful of salt, and two pounds of mutton cut into small pieces, with the addition of a jug of quass. With the very poor, of course, the meat and butter form no part of the mess; with the rich, other materials lend it a high flavour.

Fasting shtshee is made of fish instead of meat, and oil instead of butter. “Botvinya” is the ordinary summer food; it is a kind of cold shtshee. Cold quass, raw herbs, cranberries, chopped cucumber, and fish, cut into small lumps, are its ingredients.

The cabbage is very rich in gluten. The leaves by boiling are converted into a palatable food, without sensibly diminishing its nutritious quality. Professor Johnston found that the dried matter of boiled cabbage still contained 33 per cent. of gluten. When eaten frequently, however, and in large quantity, they have, in common with nearly all kinds of food which are rich in gluten, a costive or binding tendency upon the human constitution; hence the propriety of eating them with fat or oily food.

There is a dish common in Ireland under the name of kol-cannon—a mixture of potatoes and boiled cabbage beaten together, with a little pork fat, salt, and pepper.

There are more ways to cook a fine cabbage than to boil it with bacon, and yet few seem to comprehend that there can be any loss in cooking it, even in this simple way. Two-thirds of the cooks place cabbage in cold water and set it to boiling; this extracts all the best juices, and makes the pot liquor a soup. The cabbage head, after being washed and quartered, should be dropped into boiling water, with no more meat than will just season it. Cabbage may be cooked to equal broccoli or cauliflower. Take for instance, a firm, sweet head, cut it into shreds, lay it in salt and water for six hours. Then place it in boiling water until it becomes tender—turn the water off, and add sweet milk; when thoroughly done, take it up in a colander, and drain. Now season with butter and pepper, or, if you like, with a glass of

wine, and a little nutmeg grated over, and you will have a dish fit to eat.

What would the German do without his sauer-kraut or fermented cabbage? The growth of this vegetable on the continent, specially for making this preparation, is very considerable. In Alsace, cabbages are extensively cultivated, and grow to an enormous size, and a great quantity of choucroute or sauer-kraut, is made there for export to Strasburg and Germany. Every German family stores up, according to its size, one or more large casks of it. October and November are the busy months for the work, and huge white pyramids of cabbage are seen crowding the markets; while in every court and yard into which an accidental peep is obtained, all is bustle and activity in the concocting of this national food, and the baskets piled with shredded cabbage have been likened to “mountains of green-tinged froth or syllabub.”

In Wiesbaden, one hundred fine heads of white cabbage for making sauer-kraut may generally be had in the season for about 3s. The cabbages are cut into shreds with an instrument not unlike a large inverted carpenter's plane. They are placed in a four-inch layer in a cask; this is strewed with salt, whole pepper, and a small quantity of salad oil. A man with clean wooden shoes then gets into the cart and treads the whole together, till it is well mixed and compact. Another layer is then added, which is again trod down, and so on until the cask is entirely filled. The whole is then subjected to heavy pressure, and allowed to ferment; when the fermentation has subsided, the barrels in which it is prepared are closed up, and it is preserved for use.

White cabbage, called *pih-tsac*, and not unlike the Roman lettuces, constitutes the principal food of every class in China, and is said to be really delicious. It is generally understood that there is another important commercial use for the cabbage, of which the young smokers of cheap cigars could tell us something.

There is a cigar merchant in the Minorities, who declares that he had a cabbage so large that he got two boxes of “genuine Havannahs” out of it, besides two or three dozen penny Pickwicks. He says the cabbage was about the best pull he ever had, for it brought him in £3 15s. 6d., and, if he could have sold the cigars at the West End, he thinks he might have fairly doubled that sum.

After the narration of these facts, who shall despise the cabbage? Even the ninth-part of a man will stand up on his bench in its defence. All hail to the cabbage! may its shadow never grow less, and long may it continue to furnish agreeable and nutritious food for man and beast!

IRELAND AND IRISH FARMING.

I now come to a very important part of my subject: to attempt showing in what consists the best system of cottage husbandry—that is, I desire to point out the best courses of cropping and order of management suited to small farms; the best system of grazing or

feeding of stock; the best varieties of grain and roots to cultivate; the best kind of stock to keep for profit or sale, with such collateral advantages as in the course of the discussion of these subjects may arise out of them.

In 1856 there were, as I have already said, 179,931

farms not exceeding fifteen acres, and 82,035 farms not exceeding five acres; and this, notwithstanding the long and continuous attempts to enlarge the holdings, the total number of farms of all sizes being about 600,000. It is to suggest and enforce improvements in the management of these small holdings that I intend to confine myself in this paper.

In my last paper I alluded to the state of the dwellings and farm-buildings. I cannot do anything worth the doing, unless something is done to improve these indispensable to good farm-management. I must have proper conveniences for the dairying, for the poultry, the cow, the pig, and, in many holdings, for the sheep and the horse. No good can be done to any extent without order, care, and management; and what order or care can be had or taken where all is in promiscuous confusion, like a happy family in an exhibitor's cage? The pig will fatten almost anywhere; but not so the sheep, or the cow, or the horse. Custom will do much—"habit is second nature;" still these animals are naturally delicate, rather fastidious in their appetites and choice of food. The tainted atmosphere of the pig, or indeed of each other, in the most confined and worst of places, as is too often seen in small Irish holdings, is fatal to well-doing. My first point, then, is the improvement of farm-conveniences for the shelter and separation of the animals of the farm. I by no means advocate an expensive outlay: that adds to the rental. I care not that the shelters are rude and homely, provided they are substantial, or that the barn is converted into a cow-house, if need be, or other like conversions are occasionally resorted to; but I do say it is impossible in a fickle climate like Ireland to manage stock properly without shelters.

The best courses of cropping, and order of management suited to small farms.—In most of the districts I have seen, the cultivation of wheat and potatoes would be a leading feature in the course of cropping I should recommend. A great portion of the eastern part of the kingdom appears to me well-adapted to the growth of wheat: it has a soil of considerable consistency and depth. On these small holdings I would strongly recommend the adoption of the alternate growth of wheat on a given portion—say, one-fourth of the arable land; by this I mean the Tullian system, or, as it is now more popularly known as the Lois-Weedon system of culture. I believe it would "work wonders" if properly carried out; and, failing this, it would be perfectly useless. The system is but very imperfectly known, and when known most improperly practised, even by our best men. The theory is this: Strong retentive soils, wheat soils, possess naturally a large amount of ammonia—its inherent constituent. This is a most valuable food for the production of wheat, and is almost inexhaustible; because, as it becomes disintegrated by cultivating processes for the use of the wheat plant, the atmosphere and rains speedily, in a great measure, replenish the soil from which it is thus exhausted, to be again and again drawn from it for the same uses. The practice is very simple when known, and easy of attainment. It is this: The land appropriated for this purpose should

either be dug or forked over to the depth of from ten to fourteen inches; if ploughed, the depth should be six inches, followed by a subsoiler to the depth of fifteen inches: for small holdings the forking and digging are by far the best. This process may be carried out at any time and after any previous crop: every weed should be picked off as the forking proceeds. I would observe that the fresh crop would be the best if the forking could be completed during the summer months, so that the land lie open to the sun and atmospheric influences; subsequently, when once the system is commenced, the forkings will always be requisite at intervals during the summer. My own plot (about eight acres) was ploughed and subsoiled immediately after harvest, and after it had borne several corn crops. It was subsequently worked, and then drilled; and, although I commenced on an exhausted soil, it continues to improve, though every portion of the crop is removed annually, and no manure applied.

Having, then, selected the plot of land for this system of culture, and having further obtained a deep tilth, the next thing is the sowing. Now a long series of experiments has proved that the proper width of the drills is as follows, in order that the alternate system in its fulness should be properly carried out: all others have failed. There is required a space of thirty inches for annual cultivation, while a like space is bearing the crop, *i. e.*, three rows of wheat must be drilled or dibbled in at ten inches apart, leaving a space from the actual drill of 3 ft. 4 in.; but as ten inches of this space is appropriated by the two outside rows of wheat, the real space for cultivation is only thirty inches, which is the space to be cultivated through the summer ready to take the crop for the next year. We have now commenced the system. The rows of wheat will require the usual hoeings and weeding, &c., of a regular crop, and to be managed and reaped like any other wheat crop. The intervals will require to be deeply forked or dug over two or three times in fine, dry, and suitable weather, so as to secure the greatest exposure to the sun and air, carefully cleansing it as the work proceeds; and immediately after the crop is off, these intervals should be drilled or dibbled—the earlier in reason the better, as it is important that the crop-bearing intervals should be dug up as soon as possible, which could not be done before the rows are sown. This, then, is the simple course—all is cultivation. No manure is requisite: that is used for the potato or other root crops. This is the mode of cultivation I strongly advise for the wheat crop on all the small holdings of Ireland having a fair wheat soil. It may seem a novel and doubtful course, but if carried out industriously it will answer. There is nothing intricate in the system, or much to learn: it is simple cultivation in alternate slips with fork or spade—of course I mean a regular digging fork of three or more long tines. It may in the course of years require replenishing with silicious and calcareous manures, *i. e.*, coal-ashes, peat-ashes, sand or lime, chalk, gypsum, road-scrappings, or marl—these become exhausted in the straw of the wheat. This system would provide an abundant supply of profitable labour for the small far-

mer. If adopted by large farmers, the plough, horse-hoe, subsoiler, and scarifier must be brought into requisition. My next suggestion as to the best mode of cropping, &c., is this: I would divide the remaining three-fourths of the arable land into four equal parts, so that the rotation would be—1st, Fallows and root-crop (mangolds, swedes, &c.) 2nd, Barley or oats, beans or peas. 3rd, Seeds (clover, Italian ryegrass or tares, &c.) 4th, Potatoes. It may seem superfluous to allude to the fallowing process; but we all know that if a good and deep loose tilth is not provided, a poor crop of mangolds, or a still worse crop of swedes, is obtained; and not much better fare with the commoner root crops. I shall therefore only say that deep and continuous cultivation must be pursued on the fallowing plot, taking care to avoid working it in a wet or unsuitable state. A slight application of dung and a moderate supply of superphosphate or guano will then suffice to ensure excellent crops of roots. These roots are to be led off for the consumption of the stock, or they may be fed on the land. The former plan is best, because on the consumption of this crop with the straw mainly depends the value of the manure to be made; and the land can be undergoing preparation for the ensuing corn crop, which may vary according to circumstances, or as seems best in a rotation of years; but as seeds succeed best after a white corn crop, it is to be preferred; but if a pulse crop is desirable, then I suggest the succeeding crop should be tares (winter tares) or rye. My fourth crop is potatoes after seeds, or tares or rye. I do not strongly recommend the latter crop—it is too nearly allied to a corn crop, and thus detrimental to the most advantageous working of the course. The potato crop I consider the mainstay of small Irish farms, and the root crop I place next in estimation, because if these can be secured the others are nearly certain. It may be questionable whether it is most advantageous to take two root crops in succession. Why not take an intervening wheat crop? I answer because I want to provide as much food for the farm stock as possible, and I have provided the farm with an ample wheat crop independently, and as an adjunct to these very crops, *i. e.*, in supplying its straw for food and manure without requiring a return. The potato crop, then, must be assiduously provided for. As soon as the seed or tare land can be spared, it should be deeply ploughed or dug—if in trenches all the better—and so laid up for the winter. In the early spring, the weather and soil being suitable, it should be broken down, and be thoroughly pulverized till it is brought into the finest possible tilth; then have it trenched or ridged into 28-inch ridges. Apply the fold-yard manure, and also a sprinkling of Peruvian guano, or other good artificial manure, at the rate of 3 cwt. to the acre. Plant good sets from a good stock of potatoes, and cover all in together. It will only require hoeing, weeding, and a slight hilling-up, to make it a productive crop of great value.

I now come to the particulars of management of this small holding or farm, and for the better arrangement of my business, I shall assume the little farm to consist of *twelve statute acres* of arable land, of a useful

loamy character. I have already subdivided my little holding into five plots, *i. e.*, the fourth of the whole to be annually under wheat. The remaining three-fourths I again divide into four equal parts, and to be respectively under roots, corn, seeds, and potatoes; so that my twelve acres will thus consist of *three acres of wheat*; two and a-quarter acres of mangolds, swedes, or other roots, or green-food crops; two and a-quarter acres of spring corn; two and a-quarter acres of grass seeds; and two and a-quarter acres of potatoes. This, I think, is laying out the farm to the best advantage to test its powers of production.

I will now for a moment consider what varieties of grain, seeds, and roots I would cultivate. Of wheat I would invariably sow a variety possessing prolific qualities both in straw and grain. Of barley I would sow the most productive, irrespective of its malting qualities. Of oats, the better-strawed sorts. Of beans, a large-grained variety. Of peas, a sort producing a good crop of both haulm and peas. Of seeds I would adopt the large broad-leaved red clover, or the Italian rye grass, for sowing upon the white-strawed crop, and rye or winter tares for sowing after beans or peas. Of roots I would select long red bugle mangolds or long yellows, for deep loamy lands, and red or yellow globe mangolds for shallower loams. Of turnips I would select a strong-growing variety of purple-top swedes or Scotch yellows for early sowing, and the common white-fleshed varieties for late sowing, according to circumstances.

According to this arrangement I shall thus have $2\frac{1}{4}$ acres of seeds, $2\frac{1}{4}$ acres of roots, $2\frac{1}{4}$ acres of barley or oat-straw, and 3 acres of wheat-straw, to consume or make into manure. What then is the best kind of stock for use, grazing, sale, and profit. I shall estimate my root crop at 50 tons the $2\frac{1}{4}$ acres of food; my seed crop, taking the three mowings at 25 tons the $2\frac{1}{4}$ acres; and my straw at 10 tons the $5\frac{1}{4}$ acres; besides, I have many potatoes which may be unsaleable. What am I then to procure as grazing stock for use and profit, and how many? First, I must have one horse for general service; second, three useful cows for milking and breeding; third, two or three yearlings, and three or four two-year-old heifers or steers; fourth, ten or a dozen pigs, and two or three breeding sows, besides poultry. Sheep I could not fully recommend, as they do not always thrive well under the course of management I am now about to develop; but I by no means deprecate the adoption of sheep in preference to the young cattle, provided they can be conveniently lodged.

We now come to consider the best system of grazing and stock management for these small farms. The course that I would suggest is to adopt the soiling system throughout, *i. e.*, to carry all the food to the animals in their yards or hovels for consumption: for this purpose the horse would prove valuable as well as in cultivation. The horse and cows should be tied up in their stalls, and fed in their cribs; the yearlings and young cattle in conveniently sheltered yards; and the pigs in sties, with airy yards. These should all be fed with great regularity and care—in the summer with the mown seeds or clover, and in the winter with roots

and straw. The pigs might, in addition, be provided with a few cabbages or other green food in the summer; and immediately after harvest, such as require fattening to be fattened as fast as possible with the produce of the barley crop, ground and mixed with roots; but it will be found that many pigs may annually be disposed of as stores, as also the two-year-old cattle not required for dairy purposes. *The mare* may also breed a foal occasionally. I shall not minutely calculate how many head of cattle, pigs, &c., my 2½ acres of seeds will feed in the summer, or my 2½ acres of mangolds or swedes, &c., will keep in the winter; but my long experience leads me to the belief that I can readily find food for the amount of stock enumerated, *i. e.*, three cows, three or four yearlings, three or four "two-year-olds," one horse or mare, twelve store-pigs, and three breeding sows. As for hay, I would not make a bit: all the dry food will be corn and straw.

I will now attempt to show what amount of produce I shall be able to sell from the farm, and the amount likely to be realized. This will be sufficiently near and conclusive, without showing a regular balance-sheet of outgoings and incomings.

Estimate of the produce of the farm as applicable for sale:

	£.	s.	d.
To 3 acres of wheat at 4 qrs. per acre, or 12 qrs. at 45s. per qr. (a low average price).....	27	0	0
To 2½ acres of potatoes at 5 tons per acre, for sale (after supplying the family), or 11¼ tons at 60s. per ton	33	15	0
To 3 cows' produce of butter, and milk for pigs, &c., at £12 per cow	36	0	0
To 3 young heifers or steers, "two-year-olds," at £9 each	27	0	0
To 12 fat pigs, averaging 15 stones each, or 180 stone of pork, at 6s. per stone.....	54	0	0
To 12 store-pigs at 30s. each	18	0	0
To poultry, eggs, and sundries sold.....	4	5	0

Total produce sold value..... £200 0 0

Estimate of annual outgoings to deduct:

	£.	s.	d.
To rent, tithes, rates, and taxes, at 4l. per acre for 12 acres.....	48	0	0
To 1 qr. of wheat for seed.....	2	5	0
To 1 qr. of barley for seed	1	15	0
To 1 ton of potatoes for seed	3	0	0
To hired labour, independent of the family services	25	0	0
To wear and tear of implements, &c., and tradesmen's farm bills, &c.....	24	0	0
To sundries, and cash expended in manures and seeds, &c.....	16	0	0

Balance

£80 0 0

I have thus a balance of £80 to maintain the farmer's family, and as profits on his enterprise and industry. I am well aware that these estimates are open to severe criticism, but my aim is simply to show some approximate value of the produce, upon a close attention to carry out the details of the course of management I have suggested for these small holdings. Of course, as they may be smaller or larger the farmer will easily accommodate his means and appliances to suit the extent of his farm.

Although I suggest the foregoing as the foundation of

an improved system of cottage husbandry adapted to small farms, I would by no means slavishly adhere to it. A change in the rotation is often beneficial. I see no reason why flax should not occasionally, or even frequently, be substituted for spring corn, except this: it would involve the purchase of food for the pigs, and there would be the loss of straw for manure. This, however, can be supplied by some of the many artificial manures now in use. It might also be taken occasionally instead of the potato crop, if thought desirable. In fact, there are many deviations from my course which might be profitably substituted; but it will require good judgment to decide upon them. The same general remarks might apply to the stock kept; deviations will often be found beneficial, sometimes imperative, owing to various causes which will inevitably arise under the most careful management. One great principle here laid down, it will be observed, is the preparation of a considerable proportion of the produce of the little farm for sale, as in cattle, pigs, and dairying. This I much prefer to the sale of the barley and roots; and the potatoes, in fact, might in low or sharp seasons be kept or be sold as it were to the stock, for home consumption, and resold as meat or as young cattle and pigs.

I will just say a word about the implements required, and their selection, without which my little holding or farm suggestions would be incomplete. In this department the closest economy must be observed. I should require one cart, with shelvings; one one-horse iron plough, Ransome's or Howard's pattern; one set of harrows, Howard's pattern, as the chief requisites. The remaining should be chiefly hand implements. The thrashing, dressing, &c., by hire.

One remark in conclusion. I trust it will not be thought that my suggestions on the subject would require a better or more intelligent order of men to carry them out in their entirety, than the mass or majority of Irish farmers. I do not think so: they only want careful consideration, to ascertain their simplicity and value. I commend them most diffidently to my readers, and in so doing, beg them earnestly to study the whole subject; and if my suggestions do not accord with theirs, well; but by no means abandon it, but use additional energy and zeal to carry out to perfection the improvements of Irish agriculture, but particularly that of the small holdings.

AMERICAN PREPARATIONS FOR THE TURF.—

It may be, says the *Liverpool Daily Post*, in the recollection of our readers that last season our judicious townsman, Mr. Bell, of the Adelphi stables, shipped several first-class blood brood mares for Mr. Keene, of Georgetown, Kentucky, as the nucleus of a racing stud breeding establishment in that State, and among the lot so sent out one mare of pure breed had been secured from Arabia. Following up the same design of establishing a breed of race-horses, Mr. Troye, and some other gentlemen with whom he is associated, have just added to their stud the Knight of St. George (winner of the St. Leger in 1854), purchased for them by Mr. Bell from the Rawcliffe Stud Company at £1200, to be sent to Kentucky. He is eight

years old, and by Irish Birdcatcher, out of Maltese. His progeny, only yearlings, are altogether in the possession of Lord Exeter, and they are considered remarkably promising. He was despatched yesterday in the screw-steamer *Novo Scotian*, belonging to the Montreal Ocean Steamship Company, who did all in their power to carry out the instructions of Mr. Bell.

It is but right to state that the Knight of St. George is only the forerunner of several other first-class horae which will soon follow him. The breeding stock export season is just commencing; and it may be interesting to our sporting readers to know that within the last few weeks a pack of foxhounds was shipped by Mr. Bell for the Montreal Hunt.

WINTER ACCOMMODATION FOR STOCK.

At the last meeting of the Kingscote Agricultural Association Mr. J. T. Harrison read the following paper:—

GENTLEMEN,—The subject which I have the honour of introducing for your consideration this evening—the winter accommodation for stock—is one of the most important that can engage the attention of those interested in agriculture, whether as owners or occupiers of the soil. I shall endeavour to point out to you wherein this importance lies, namely, as influencing the health and improvement of the stock, the economy of food, and the manufacture and preservation of the manure. We will, then, review the various systems of wintering stock which are adopted, and remark upon their advantages and disadvantages. And I will conclude by offering a series of propositions for your adoption, some of which you will probably unanimously agree to; whilst upon others there is sure to be a great variety of opinion, the free and open expression of which by the members will, I have good hope, be of service to the cause of agriculture. In some of the districts in Gloucestershire the accommodation for stock is nearly the same as it was eighty years ago; and the description of it given by a very intelligent writer, in 1787, stands true to the present day. He says (“*Marshall's Rural Economy of Gloucestershire*,”): “The farmeries are very simple, and in general very mean; a small, old, timber-built dwelling-house, with a calf-stage, a hovel to hold a cow occasionally, and a stable for two or three horses, are considered the only requisites; if a cow-shed be added, the farmery is complete.” The same writer says (page 18, vol. i): “I found nothing strikingly new in the buildings and farm-yards of the Cotswold Hills.” There have, however, been many improvements made since then, but they are by no means general; and so lately as 1850, Mr. Cird, thus describes a Gloucestershire dairy farm in January:—“An inconvenient road conducted us to the entrance-gate of a dilapidated farm-yard, one side of which was occupied by a large barn and waggon-shed, and the other by the farm-house, dairy, and piggeries. The farm-yard was divided by a wall, and two lots of milch cows were accommodated in the separate divisions. On one side of the first division was a temporary shed, covered with bushes and straw; beneath this shed there was a comparatively dry layer for the stock; the yard itself was wet, dirty, and uncomfortable. The other yard was the exact counterpart of this, except that it wanted even the shelter-shed. In these two yards are

confined the dairy stock of the farm during the winter months. They are supplied with hay in antique square hay-racks ingeniously capped over, to protect the hay, with a thatched roof very much resembling the pictures of Robinson Crusoe's hat. In each yard two of these are placed, round which the shivering animals station themselves as soon as the feeder gives them their diurnal ration, and then they partially ruminate the scanty contents. A dripping rain fell as we looked at them, from which their heads were sheltered by the thatched roof at the hay-rack, only to have it poured in a heavier stream on their necks and shoulders. In the other yard the cows had finished their provender, and showed their dissatisfaction with its meagre character by butting each other round the rack.” Probably every one of us could indorse this as a true description of some dairy farms. This state of things is not, however, confined to the dairy district of Gloucester, but is in a more or less flagrant degree to be found generally throughout the kingdom; and, as pointed out by Mr. Grey, of Dilton, in a paper on farm-buildings, published by the Royal Agricultural Society in 1843, the consequence is a much greater demand for farms that are well supplied with every convenience for man and beast. The buildings have been well called “the meat and manure factory of the farm”; and the constant improvements in the other departments of agriculture are forcing attention to this, which admits more than any other of the introduction of systematic and factorylike arrangements. And no more can a farm be called in a proper state for a tenant to turn it to the best account without suitable buildings, than a windmill without vanes or stones would be for its profitable occupation by a miller. It becomes, then, a most important question what description of buildings are most suited for the purpose, and cheapest in their construction; for I fear that in many cases the outlay expended on the home-farm has deterred landlords from extending the benefit of suitable and well-arranged buildings to their tenants generally. Let us, then, consider the subject more in detail: And first, as to the health and improvement of the stock, the economy of food, and the manufacture of manure. 1. When the cattle are wintered in the open fields: During a winter, such as that now passing away, stock may do very well in the open fields; and I can instance one case in which, although the farmer has some accommodation in the shape of yards and sheds, he has kept all his stock in the fields. I cannot, however, believe that this is good management, either as regards the stock or

the fields in which they are kept, whilst it is not economical in respect of food, and I question much if the manure is so useful as it might be: the cattle selecting sheltered spots to lie upon when they give the ground an over dose, causing sour rank grass to grow, which they reject the following season. As I am obliged to keep some stock in the fields during the winter, I have lately erected two sheds, in which I find the cattle lie every night, and by keeping them littered there is a considerable quantity of useful manure accumulating at distant parts of the farm; and I am inclined to think that for young stock, and when the land is thoroughly drained, it may be advantageous to pursue this system at a distance from the homestead, as it saves the cartage of the hay-house and makes some manure where it is generally much wanted. I may mention that the sheds I have put up are very simple; the arm of each of them is about 500 square feet, affording accommodation for sixteen young beast coming two years old, at a cost of £13 each shed, including all the materials (excepting the straw and labour). This part of the subject opens the question of the effect of the droppings of the cattle in the open fields. It appears from the analysis of Dr. Voelcker that fresh manure contains very little soluble fertilizing matter; and that it is only as decomposition takes place that it becomes soluble, and fitted for the food of plants. Now droppings lying on the ground, exposed to drying winds, are not favourably placed for inducing decomposition, and I believe that even when beaten about, the effect will not be nearly so advantageous to the farmer as if the manure was collected into heaps, mixed with earth, which retains the soluble nitrogenous and other substances induced by fermentation; and after being spread, the first rain carries them to the roots of the grass. It may have occurred to you that we do not require to beat our grass grounds to any great extent after the cattle have been running in them all the summer; how is this? Observe the customers we then have for this part of our farm produce; sometimes the droppings are instantly covered by innumerable flies; at others rooks and other birds pecking away at them, show that they have become the food of various worms and insects, by whom, on turning it over, we find it to be thoroughly honey-combed, and reduced to a mere skeleton. Here is evidently a great waste of fertilising matter. I have seen persons employed collecting the manure, and carting it off in the vale of Berkeley; and I find the practice thus recommended by Mr. Thomson in the Royal Agricultural Society's *Journal* for last year (No. 41, p. 255). One of the cheapest and most effective plans, is to employ an old man with a donkey-cart to go round the pastures collecting the droppings of the cattle, and making them into compost with road scrapings, ditch cleanings, &c. If a manure collector be once appointed, numerous odds and ends of fertilizing substances will be found available, which would individually be worth little, and which are now wasted, &c. But the collection of manure should be incessant. The droppings of horses and cattle, especially if collected fresh, form a very important source of compost, and the improvement is two-

fold. 1st in the saving of that which is otherwise to a great extent, wasted; 2ndly by the cleaning of the pasture, and the much more uniform grazing of the cattle when the droppings are not allowed to remain and produce coarse tufts for some months after. He recommends the turning of the compost heap once at least. I will next proceed to the consideration of the effects on the stock, feed, and manure, when the cattle are wintered in open yards, without sheds. In such, if there is a warm comfortable spot well littered, the animals will soon select their bed; but there is really no one point to recommend such a mode of wintering stock; it cannot be healthy for them to be subjected to all the changes of our varying climate. Animals so exposed must require more food; and as to the manure made by them, it is hardly possible to devise a more effectual system for its extravagant waste. It may be as well to discuss here generally the question of yard-made manure, as it will apply equally, perhaps with greater force, to that made in yards with sheds attached. Straw and droppings from the cattle, did they remain in their primitive condition, would be of little use in fertilizing the land, because a very small proportion of them is soluble; by degrees, however, a slow fermentation ensues, the particles re-arrange themselves, and very valuable fertilizing products are formed, which are soluble; so that, were the process carried far enough, the whole of the valuable part of the manure might be washed out, and what Mr. C. Lawrence calls the dry body whose spirit is departed alone be left to be carried to the field by neighbour Drychaff's creaking hearse. Now, consider, the manure left exposed in a yard is favourably placed for undergoing rapid decomposition (unless it is literally covered with water), it is well exposed, occasionally wetted by genial showers, not too hard compressed by the treading cattle, as it is spread over an extensive surface; everything is promising for a good brewing, and in due course down comes the pelting storm; and the rich porter-coloured stream flowing from the yard, and down the adjoining stream, but too truly tells of the efficiency of the decomposition and the value of departed worth. I feel confident that there is no satisfactory argument for manufacturing manure in exposed yards, where it is subjected to be thus robbed of its most valuable constituents. It may be asked, what are we to do with our straw in cases where we have so much, and, our live stock being principally sheep, it is only by exposing in yards that we can convert it into manure at all? I should be glad to hear your opinions upon this point; but I question much whether we have by any means arrived at the maximum use of straw as fodder for sheep as well as cattle. The late Sir George Sinclair, in his work on "Husbandry" (vol. I, page 378), in 1844, mentions a saying of Dr. Keith's—"Take care of the straw, the corn will take care of itself"; and he mentions a remark of Marshall's, "That if a Yorkshire and a Norfolk farmer got equal quantities of straw, the Yorkshireman would make his cattle eat every particle, and would scarcely have any to litter their stalls with, whilst the Norfolk man would convert the whole into muck; the Yorkshireman would keep more cattle, and would carry out his dung at less

expense, whilst the Norfolk man would make more muck. Others would prefer a middle course, that of eating one-half, and converting the rest into dung." In a letter written a few weeks ago by Mr. Bond to the editor of the *Agricultural Gazette*, explaining the means by which his sheep are maintained at so cheap a rate, it is shown that for three months in the winter they are fed on straw and mangel alone, and during the three spring months—March, April, and May—on straw, mangel, cow-cabbage, and grass, with the addition of oilcake and bran-meal, no hay being given to them throughout the year. I should notice that his farm is a clay soil, and not suitable for folding sheep on the land; still there does not seem any decided objection to feeding them similarly in the fold as he does in the yard. I shall close my observation on open yards by heartily expressing my argument with the following observation in "Morton's Cyclopædia," that "All manure should be made under cover, either in stalls, boxes, or sheds." Let us now proceed to the consideration of covered accommodation for stock. Here a new feature presents itself, a new element of serious moment, viz., the expense; and it may be well to consider it a little separately. Simply as a matter of expense there is no system so economical as stalls; a shed 16 ft. wide is sufficient for a pathway (3 ft. wide), a manger, and standing room for the animals, whilst 4 ft. in the breadth of the shed is ample; so that 64 square feet only are occupied by stall-fed cattle. And Mr. Caird mentions some stalls erected on Lady Londonderry's estate, where 20 head of cattle are housed in a wooden shed at a cost of £30, or 30s. per head, the shed being 70 ft. long and 15 ft. wide, only 7 ft. in width being allowed for each pair of animals, each animal thus occupying only 52 square feet. Now, in the box system it is usual to allow 10 ft. by 9 ft. for the box, and the gangway cannot be taken at less than 2 ft. by 10 ft. more—making 110 square feet for each animal. These boxes will certainly take in two younger animals, but each full-sized fattening animal requires a separate box. As a question of first cost in the erection of the buildings the boxes may be taken at nearly double of the stalls. As to the expense of the sheds with yards attached, much depends upon the variety. I think it is never desirable to keep more than six animals together in one yard: for this number a shed 36 ft. long and 10 ft. wide, affords comfortable accommodation; this is 60 square feet for each animal, and is as cheap as anything. But if it is considered desirable to keep each animal in a separate yard, it requires a shed 10 ft. wide divided into length of 8 ft. 6 in.; each animal then occupying 85 square feet. Such sheds would, however, hold two small animals; whereas no animals could well be placed closer together in the stalls than as mentioned above. Considering the simplicity and cheapness of a 10 ft. compared to a 15 ft. roof, I think I may place the order of cheapness as follows:—

Sheds and yards to hold 6 animals
Stalls
Sheds and yards to hold 1
Boxes.

But although this question of first cost is one of very

material importance, I cannot think that it is one that should decide the question of selection; for I believe that the other points involved, viz., the health of the stock, the economy of food, and the manufacture of manure, should far outweigh it in the consideration of the owner, as well as the occupier of the soil, for upon them in a great measure depends the improvement of the estate. Let us first, then, consider the benefits, &c., of stalls as to the health, &c., of the animal. However well it may be suited for fattening stock, I cannot believe that it is by any means desirable for store stock, to preserve which from the inclemency of the weather I believe to be most important, but at the same time it is equally necessary to keep them healthy and hardy, which I conceive can only be done by giving free access to the open air. This observation applies equally to box-feeding store stock. Mr. Huxtable, whom you all know by reputation, and who keeps about 100 head of cattle on his hill farm, was a great advocate for entirely housing his stock; and Mr. Caird says, in 1851, "The whole stock of the farm, except the breeding ewes, are kept constantly housed night and day, summer and winter, and no particle of their food or manure is suffered to be wasted." It appears that Mr. Huxtable persevered in the system for six or seven years, but at last gave it up, as Mr. Ruegg states in his essay on the farming of Dorsetshire. In the "Journal of the Royal Agricultural Society" for 1855 Mr. Huxtable mentioned the result of an experiment which seems important. He carried on for six or seven years the practice of keeping his dairy beasts in houses, only turning them out once a-day for exercise. This at first was found profitable in many respects; but ultimately the constitution of the cows and of their progeny became so enfeebled, and the development of tubercles in the lungs of the calves so marked, that two years ago the practice was altogether abandoned, and now his breeding stock and cows are kept principally in yards with sheds attached, their food being taken to them. This practice has been found to answer so well, that in future it will be wholly followed. Mr. Guy, of Dilton, a well known agriculturist, calls stall-feeding the unnatural practice of tying-up cattle to stakes, denying them the natural use of their limbs, the choice of their position in lying down, and the means of varying the atmosphere in which they are confined—a matter in which cattle are peculiarly discriminating and sensitive. As to food, I believe there is little to choose between box and stall-feeding: they both admit of its most economical use; and upon this point the only difference between them and feeding in yards with sheds attached is on the point of the warmth afforded by them, and the consequently smaller quantity of food required by animals fed in them. This is of importance, but I believe it to be of less than that of health. More upon this point presently. As to the manure made in stalls, I don't think there is much to recommend them. The ordinary practice is to clean out the stall twice-a-day, forming opposite the stalls a heap of manure which is generally exposed to the action of the rain, and being thrown loosely into a heap is in the very best state to

encourage rapid decomposition; and I know from experience that there is an enormous loss during wet weather; and even if the precaution of a tank to receive the drainings is adopted, still I believe it entails unnecessary expenditure of labour. The system is sometimes modified by allowing the manure to remain under the animals for several weeks; and I find the manure so made with care to be very good, and not to be injurious to the health of the fattening cattle. The box-system next calls for attention. The same remarks apply to it as to stalls as to the health of the animals and the economy of food. It has the advantage over stalls of giving the animals greater freedom of action, and is no doubt good as to economizing the food. As a manufactory for manure, I believe there is no system to be compared to it. And here it will be well to make some remarks upon the subject of the manure made by farmers. We talk in our discussion upon the growth of roots, corn, &c., of applying so many tons or loads to the acre—little taking into account the difference of its value per load. I will call your attention to some experiments made by Lord Kinnauld, and reported in the "Royal Agricultural Society's Journal" for 1853. The comparison was instituted between manure made by bullocks fattening in a covered yard and that made by another lot stall-fed which was thrown on into an open yard occupied by well-fed young animals. He considered that the manure, from the circumstances under which it was made, should have been about equal. The experiment was tried on a field of twenty acres of very equal quality of rich loam, &c., divided into two equal portions, twenty loads of manure per acre were applied, and the field planted with the same kind of potatoes. Two acres on each half were measured, and the crop weighed. The result was:

UNCOVERED DUNG.

	Tons.	Cwt.	Lbs.	
First acre produced ..	7	6	8	of potatoes.
Second ..	7	18	99	"

COVERED DUNG.

First acre produced..	11	17	56	"
Second ..	11	12	26	"

The field was afterwards sown with wheat, and the result was

WHEAT ON UNCOVERED DUNG.

	Produce in Grain		Weight per Bushel.	Produce of Straw.
	Bush.	Lbs.		
One acre	41	19	61½	.. Lbs. 3,344
Two acres	42	33	61½	.... 3,520

WHEAT ON COVERED DUNG.

One acre	55	5	61	.... 4,840
Two acres	53	47	61	.... 4,620

These figures speak for themselves, and leave a broad margin for errors of observation, &c., &c. Taking the potatoes at £3 a ton, and the wheat at 5s. per bushel, the straw at £1 a ton, the loss on the ten acres in the two years, from the injury done to the manure by exposure, amounted to the sum of £157, or nearly £16 an acre. The question may fairly be asked, can this be true? Let us refer to Dr. Voelcker's valuable papers in the late *Journals* of the Royal Agricultural Society: we shall see among the conclusions he comes to, after a careful investigation into the condition and value of

farm-yard manure under different circumstances, that the soluble constituents of dung are much more valuable fertilizers than the insoluble; that farm-yard dung, even in quite a fresh state, contains phosphate of lime, which is much more soluble than was suspected; that the drainings from dung-heaps are very valuable; that well-rotted dung contains a much larger proportion of soluble matter, and is richer in nitrogen than fresh—and so weight for weight is more valuable than fresh—it is, however, much more liable to loss from exposure to rain, whilst, practically speaking, all the essentially valuable manure constituents are preserved by keeping farm-yard manure under cover. He says, however, that when there is a superabundance of straw, it may be advisable to expose it. The worst method of making manure, is to produce it by animals kept in open yards, since a large proportion of valuable fertilizing matter is wasted in a short time, and after a lapse of twelve months at least two-thirds of the substance of the manure is wasted, and only one-third inferior in quality to an equal weight of fresh dung is left behind. Professor Johnston also found that well-rotted dung had lost more than half of its weight, and he remarks that "a part of this loss may no doubt be ascribed to the evaporation of a portion of the water of the recent dung, but the larger part is due to an actual escape of the substance of the manure itself." This all goes to show the very great importance of properly manufacturing manure, and, when it is manufactured, of properly preserving it. On this point the best system seems to be that recommended by Mr. C. Lawrence, viz.: forming the heap of manure very much like our mangel heaps, and covering, or rather plastering it over with a coating of road-drift or mould. The earth covering prevents the escape of ammonia, and from the form of the heap the water is thrown off. Returning then to box-feeding, its superiority as a system for the manufacture of manure must be admitted as economising food; also it is excellent; but I think it is very questionable as to its superiority for wintering store stock. Now, my own impression is that sheds with yards attached are best suited for maintaining the stock in health, that there is not necessarily any great difference in the economy of the food; and that, if properly managed, the manure made in them may approximate very nearly to that made in boxes, whilst they have decided advantages in this respect over stalls as generally managed. The following are the opinions of persons in different parts of the country: A friend of Mr. Burnett's, in Kincardineshire, says, "A few years ago, nothing was thought so suitable for accommodation of stock as covered yards; now people are more anxious to have small sheds and yards for all store and fattening cattle." Another, in Forfarshire, says, "I much prefer keeping all my store and fattening cattle in small yards and sheds, say from three to six in a yard, finding them do better than when tied up or in loose boxes." A friend of mine, now farming in Wales, who comes from Kincardineshire, also says, "Store cattle should also be in yards, to go into when they like: avoid draughts, and do not keep too many together." An excellent farmer in the county of Durham, a breeder of prize shorthorn

stock, says he prefers box feeding to any other method ; and better still with a small yard for exercise. He says such are the best for feeding prize animals, but he recommends only two beasts being together when not tied up. Stevens, in his "Book of the Farm," says: "Mr. Boswell's testimony in favour of hammels (that is, small sheds and yards) is most conclusive, and it is this: 'From the result of my own experiments, as well as the unanimous opinion of every agriculturist with whom I have conversed on the subject, I feel convinced that there is no point more clearly established than that cattle improve quicker, or, in other words, thrive better in open hammels than in close byres.'" Mr. Stevenson, in his essay on the farming of East Lothian, in the "Royal Agricultural Society's Journal," says: "The cattle, while being fattened, are usually kept in open courts; when these are comfortable, and the cattle of a quiet disposition, they are found to make nearly as great progress as those fed in stalls or boxes. During fine weather the rate of progress is found to be equal." And, in another place, he says: "Mr. Brodie, by experiment, satisfied himself that feeding in open courts is preferable to boxes." The opinions above are those of North-countrymen and Scotchmen. I have already mentioned Mr. Huxtable, of Hampshire, having recourse to sheds and yards, after proving the injurious effects of constant confinement upon the constitution of his stock. Mr. Ellman, of Sussex, recommends sheds and yards for young stock, as nothing contributes more to their health and strength than giving them their liberty and suffering them to range while young. I think these opinions are sufficient to prove that as regards the health, &c., of the stock, and the economy of food, sheds and yards are preferable to boxes. Then, as regards the manure made in them. In "Merton's Cyclopædia," I find them thus objected to: "In the system of shed and yard feeding, there is the objection that the more valuable parts of the manure are exhausted into the atmosphere, or washed away by every shower." Now, to this I contend that it is not at all necessarily the case that either of these results should follow. All that is required is to litter the sheds, which may even be slightly sunk, as in the box system; and keep your yards clean, which when but slightly littered I know is not very difficult. I do not see any objection to putting the scrapings from the yards under the sheds, and covering it with straw, so as to maintain a nice comfortable layer for the cattle. And I know that the manure thus made under the shed will be very similar to box-made manure. Stevens, in his "Book of the Farm," who advocates sheds and yards in preference to boxes, says: "The manure would be equally as well compressed and good in sheds as in boxes. I observe sometimes the directly contrary management to that I am advocating, viz., the practice of cleaning out the sheds frequently, and exposing the manure to the action of the rain, &c. I am sure this is wrong. But I shall be met with an objection to this, by those farmers who have more straw than they know what to do with; whose great trouble, in fact, is to get their straw rotted. I have previously combated this argument, and pointed

out the necessity for the more extensive use of straw as food for our stock; but I shall again be met with the objection that the straw grown in our southern climate is by no means so good as that in the North of England and Scotland; but if Mr. Bond is able to feed and do his sheep well on straw, surely we may expect it will prove good food for cattle also. Let me now draw your attention to some remarks of Marshall's, who, in writing on the farming of Gloucestershire in 1789, thus highly speaks of the sheds, and yards peculiar to it: "What characterizes the bullock sheds of this district, and distinguishes them from those of every other I have observed, is the circumstance of each bullock having a house and yard to himself, in which he goes loose, occupying them by turns, as appetite or amusement directs him; having a manger and a drinking trough to go to at pleasure. He, of course, eats when he is hungry and drinks when he is thirsty. He is also at liberty to rub or to lick himself, as well as to keep his body in a degree of temperature as to heat or cold. Theory could not readily suggest more rational principles." Marshall goes on to describe the dimensions, &c., of the sheds, and then adds: "The partitions of the pens are gates, reaching from the pillars to the boundary wall, and likewise from pillar to pillar; when they are fixed in that position each bullock has his stall and his little yard. When in this, each is shut up in his stall; the yards forming a lane, or driftway, for taking in or turning out any individual." A modification of this old Gloucestershire system may be seen at Colonel Kingscote's home farm. The alteration is, I think, very important: the manger and drinking trough at Kingscote are in the yard, protected by a small roof, leaving the shed simply as the bed for the animal and a manure factory. In conclusion I beg to suggest the following propositions for your discussion: 1st, That for the benefit of the land, the health of the stock, the economy of food, and preservation of the manure, it is desirable that all the stock of a farm should be housed during winter. 2. That on small farms such accommodation as is required should be provided at the homestead or on large farms at a few well-selected spots, so as to economize labour and ensure efficient supervision. 3. That although yards are desirable for admitting the animals to the enjoyment of the fresh air and sunshine, and even occasionally of a good shower of rain, as well as for exercise, yet that, as a rule, they should not be made the receptacles for, or the place of, manufacture of the manure, in consequence of its exposure in them to the deteriorating effects of rain, &c. 4. That, when it is necessary to remove manure to the fields, it should be either applied immediately to the land, or be so stacked as to expose the least surface to the action of the rain; and should be further protected by a covering of road-drift or earth, sloping like the roof of a house, so as to throw off the rain, the earthy covering interrupting the ammoniacal and other gases arising from the decomposition of the manure. 5. That the old Gloucestershire system of small yards and sheds, with the covered feeding-trough in the yard, holding one full-grown animal, or the

Scotch system of a yard and shed adjoining, accommodating two to six full-grown animals, is preferable, as respects the health of the stock, to either stalls or boxes; that they are on an equality with them as respects economy of food in fine weather, and, is free from draughts, in moist weather; that they are preferable to stalls, and very little if at all inferior to boxes, if properly managed; as a means of making and preserving manure. 6. That although stalls may be erected at the cheapest rate per head, the difference is not greatly in their favour. 7. That boxes are more expensive in the first construction than sheds with open yard. 8. That sheds on the Gloucestershire plan, to accommodate one animal in each compartment, should be ten feet wide by nine feet, with a yard of double the size. 9. That sheds on the Scotch system, to hold six animals, should be ten feet wide and thirty-six feet long, with a yard thirty-six feet by thirty-six feet. 10. That in this neighbourhood the sheds should be placed facing the south or south-east, avoiding a south-westerly aspect, in consequence of the prevailing winds and heavy rains coming from that quarter, and that great care should be taken to prevent draughts. 11. That no farm is properly furnished for the occupation of a tenant without sufficient winter accommodation for the stock the farm will carry being provided. 12. And that, as the cutting of the straw &c. into chaff is of very important assistance in economizing the food of the farm, it is highly desirable that advantage should be taken of the streams of water which abound in the neighbouring valleys as a simple, even, ready, and most steady motive-power. I shall conclude with the following opinion of Sir John Sinclair in his "British Husbandry," in 1814. After examining the system of feeding in open yards, feeding-house, and hammels, he says: "On the whole, the

third plan, that of hammels, though the most expensive, is certainly to be preferred. The advantages of it are described by Mr. Robertson in the following terms: 'I have found these hammels or cattle sheds much better than any large or open court and yard. Cattle kept in great numbers waste more straw; they fight, and hurt one another with their horns. All this is prevented when they are kept in separate divisions; and, above all, in these hammels we can give them what meat we choose, and in what proportion we think proper, and can separate those of different ages which ought not to be associated together.' He goes on to observe that they are equally suited for horses, and are much more healthy for them, in which I quite agree."

The discussion turned principally upon the comparative advantages to be obtained from the clearing out of the yards every day, or letting the dung remain for a time. This arose in a great measure from the meeting being composed of hill and vale farmers; the former contending for letting the dung remain in the yards, that they might convert their wheat-straw into manure, the latter contending for clearing out the yards every day to save straw. After much interesting exchange of opinions, the following resolution was agreed to:

Resolved—That for the benefit of the land, the health of the animals, the economising of food, and preservation of manure, it is desirable that the stock of a farm should be housed during winter. That the old Gloucestershire system, as mentioned by Marshall in 1789, of small yards and sheds, each holding one full-grown animal or two small ones, with the feeding-trough (covered) placed in the yard instead of the shed, or the Scotch hammel system of a yard and shed adjoining, accommodating from two to six full-grown oxen, is preferable as respects the health of the stock to either stalls or boxes; that they are on an equality with them as regards the economy of food in fine weather, and, if free from draughts, in moist weather; that they are preferable to stalls, and very little if at all inferior to boxes, if properly managed, as a means of making and preserving manure. That no farm is properly furnished for the occupation of a tenant without sufficient winter accommodation for the stock the farm will carry being provided."

TREES FOR THE METROPOLIS.

We keep account of the buildings that are run up in the metropolis. Our statistics on most points connected with its population, trade, shipping, and vehicles are pretty accurate; but who can tell us how many trees have been planted in London and its environs last year—or for any number of years past? And yet the planting of trees is a matter of no slight importance in and about a great city, both for ornamental and economic purposes. How little is done to relieve the dark grim ugliness of London in this respect! Long monotonous lines of streets and squares, great hotels and termini, public buildings of various kinds, docks, and railway stations, spring up in rapid succession; but no one cares to plant a tree to afford its shade-relief and pleasant foliage for the eye forced to wander over continuous masses of white stucco.

The annual report to the Metropolitan Board of Works just issued by Mr. Marrable, their superintending architect, tells us that the number of new buildings

erected within the metropolis during the last three years cannot be less than 20,000, exclusive of additions. Now, if but the same number of useful and ornamental trees had been planted in that period, what a benefit would have been conferred on present and future generations!

A year or two ago our contemporary, the *Building News*, suggested and supported, in a series of articles, the advantage of a more general introduction of shade-trees for the metropolis. These suggestions met with very general approbation in all quarters, but as yet have been very little acted upon by private individuals or public bodies. It cannot be because trees are unsightly. The Boulevards of Paris, and the like-planted avenue-streets of the continent, are undeniably picturesque and attractive; nor are the avenue high roads without charms. Indeed, the avenue is a recognized artistic resource by which many of our country mansions and parks profit. Who has not wandered with

pleasure under avenues of elms and oaks, the clustering chestnut flowers, and the sweet-scented limes? We are not recommending, however, what are the best trees for cities, we are merely enforcing the opinion of the desirability of increasing our sylvan representations in the urban and suburban districts.

"Dinna forget to plant young trees wherever you can set them," was the last advice of a shrewd Scotch landholder to his heir, "for they'll grow while ye're sleeping." Any rich up-start can build a fine house in a very limited time, but he cannot build the old oaks. Every year that we neglect to adorn our pent-up squares, broad thoroughfares, and suburban drives with trees, we are wasting the time that the vigorous shoots might be rooting more and more firmly in the ground. It is not desirable to have trees too thick, so as to keep the sun entirely from dwellings; but houses, streets, and walks may be partially shaded with very great advantage.

It is related of the great Oberlin, that he made every child in his schools plant and rear at least two trees; and thus in a short time the Ban de la Roche, a district naturally bare and rocky, was insensibly covered with luxuriant plantation. In Bale, there is also an excellent custom. Six trees are planted on the occasion of every marriage, and two at the birth of every child. An abundant supply of trees is thus systematically obtained. Here, on the contrary, individuals are more prone to fell, root up, and destroy trees than to plant them. Something on a small scale is doing in tree-planting in the new parks; but shrubs rather than trees seem to have the preference. We are glad to hear that the Crystal Palace Company are about to form an arboretum in their grounds at Sydenham, for this will be an additional attraction, and public benefit.

It has been suggested that each district board in the metropolis should have a landscape gardener attached to it, who might be paid a small yearly fee for suggesting and directing the planting of trees. The vacated churchyard sites in the city, old Smithfield, and other localities might be adorned by a few trees and shrubs, which could be kept in order for a few pounds a year. There are several deserted squares and groves, now devoted to dead cats and dogs and rubbish, which might also be reclaimed by the surveyors of the Board of Works, and a few trees planted.

When we cross the channel, and observe how systematic is the planting of trees in the principal towns and cities of the Continent, and how much they add to the beauty and leafy shade, we might take a useful lesson for some parts, at least, of London and its suburbs. What can be more stately and attractive than Berlin and Potsdam for their Lindens, Strasse and Unterlinden, and Paris for its Boulevards and Champs Elysees?

Paris, which is much better supplied with trees than our own metropolis, suffered however in the destruction of those of the Boulevards some ten years ago, to serve as barricades, or to make room for trees of liberty—trees which, however, never prospered. A classified system of planting has recently been adopted

by the civic administration, and each of the Boulevards are to be characterised by the shade and ornament of a special class of tree: whether this uniformity will not have a monotonous effect remains to be seen. Thus the Boulevard de la Madeleine and des Capucines are to be planted with planes; the Boulevard des Italiens with Japan sumacs, the Boulevard Montmartre with elms, the Boulevard des Poissonniere and Bonne Nouvelle with chestnuts, the Rue Royale with South American sycamore or maple, and the space in front of the Gymnase with catalpas. This autumn the plantations will, it is said, be continued up to the Bastille.

There is ample scope for the introduction of trees, with great benefit and picturesque effect, in many localities of the metropolis: such, for instance, as the new roads formed near the Kensington Museum; the approaches to the new Chelsea bridge; the Grosvenor Road, on the Thames embankment, from the Picnic Pier to Chelsea Hospital; Portland Place; the proposed road from Limehouse and Bow to Victoria Park; Victoria Street and Vincent Square, Westminster; Camberwell Green, and such like open spaces.

There is no necessity for sticking trees round the Royal Exchange, St. Paul's, Trafalgar Square, or other similar circumscribed spaces; but there is no reason why they should not adorn the river banks, or some of the railway lines and termini, the banks of canals, the centres of squares, and open roads and streets.

Not only do trees attract and condense the moisture suspended in the air and borne by the winds over the earth's surface, which, falling from their leaves, keeps the ground below moist and cool; but they can, by means of their roots, pump it up from a very considerable depth, and, raising it in the atmosphere, diffuse it over the face of the country. Trees by the transpiration of their leaves, surround themselves with an atmosphere constantly cool and moist. They also shelter the soil from the direct action of the sun, and thus prevent evaporation of the water furnished by rains.

But, apart from the aerating functions of such a large body of trees, the possession of some 20,000 timber trees would in the next generation be no insignificant asset of the then Board of Works. There is scarcely a municipality in Europe which has not valuable property of this kind in its streets, place d'armes, ramparts, and esplanades.

The Metropolitan Board has now the ownership of many thousand acres of thoroughfares, and this area will be increased by new parks, the embankments, and by lapsed squares and commons, constituting a large domain, and the available portion of it bearing, or capable of bearing, many thousand trees.

Judicious planting would go far to redeem the insignificance of many long lines of mean buildings, which now detract from the appearance of noble thoroughfares; and we trust that amid the other public improvements carrying out, or projected, the more general planting of trees will not be overlooked.

THE SEWAGE QUESTION: THE RELATION OF TOWN AND COUNTRY.

In a previous number we gave under the above title a glance at the "sanitary" and "commercial" features of the question, the former having relation to the town, the latter to the country. And it is only in viewing the matter in this two-fold aspect, that any sound conclusion can be arrived at, in connection with the important questions, "How shall we get rid of the nuisances of the towns?" and "how best convert them into valuable benefit in the country?" And the more fully these two questions are investigated, the more fully proved, we take it, will be the position which we have always advocated—that the primary duty of the towns is to get rid of the nuisances, alike dangerous and degrading, arising from the presence of materials which in the country have some value as fertilizing agents; and that their secondary or subsidiary duty is to obtain for them the amount of this value, not looking upon it as a source of repayment for all expenses incurred in getting rid of the nuisance, but gladly accepting it as just so much fortunately contributed to the carrying out of a sanitary measure, which their duty imperatively demands that they shall carry out at any cost, and irrespective of any other consideration. This view of the matter being conceded then, as conveying the principle by which much of the difficulties of the question may be solved, it will be interesting to trace, as briefly as is consistent with the importance of the subject, those plans which, whilst they fulfil the requirements of the sanitary, fulfil also in a degree more or less modified those of the agricultural or commercial department of the subject.

In considering the various plans by which the refuse of towns can best be applied as fertilizers in the country, it has been usual to divide these into two great classes, first, the "liquid," and second, the "solid" methods. What are the distinctive features of each of these systems, and how they are proposed to be carried practically out, we have already briefly explained in the articles alluded to at the commencement of the present paper. We pass on, therefore, to the explanation of a method of operation, which, as it embraces some of the peculiarities of both of the above systems, may be termed the "composite," and which is advocated by Mr. Austin, in his recent report to the Board of Health, "On the means of Deodorizing and Utilizing the Sewage of Towns." This "composite" plan may be briefly described as a method of getting rid in the first place of the solid and more offensive portions of the sewage, using the material so obtained as a solid manure; and in the second place, using the liquid portions so purified in the irrigation of land, in large and systematically applied quantities. Leaving for after-consideration the agricultural, let us attend to the operative features of the plan.

And first, as to the method of getting rid of the more offensive portions of the sewage, and preparing them as

a solid manure. Of the plans fitted to secure this Mr. Austin draws attention to the works at Cheltenham, as "the most extensive, and at the same time most successful." Of these we now offer a brief description. At the principal out-fall, a large building is erected, the lower part of which is divided longitudinally into two large reservoirs or tanks, used alternately. Each tank is divided by transverse partitions into three tanks, of which the upper and second are "filtering," the lowest is "lining" or purifying. In the first and second tanks large angular filters are placed, five feet deep and two feet wide, and the sides of which consist of layers of coarse gravel confined within two inch perforated boards. The sewage as it passes from the tank to the interior of these filters, leaves in the filtering material much of its solid impurities. The heavier matters of the sewage deposit themselves at the bottom of the tank, whilst a thick scum or floating mass gradually accumulates on the surface, till it reaches to a thickness of eighteen inches.

From the interior of the angular filters the liquid is led to the third, or liming tank. In this, a wire or division causes it to flow through a channel at each end, and, in its passage through, to meet a stream of cream of lime, which is let fall from the floor above, and by means of which a further precipitation of the solid matter in suspension is secured. The liquid sewage, thus comparatively purified, passes through a filtering mass of gravel, finer than the previous filters, and finally through a still finer mass in the outlet.

As one set of tanks is found to contain a certain amount of solid matter, the sewage is turned off to the other. The filters are then cleaned, the filtering media being removed and washed. Above the series of tanks thus described, a boarded floor is placed; in this a series of "traps" are placed, through which the slush in the tanks below can be hoisted up to the floor of the second storey. The "slush" is then wheeled out and "tipped" over amongst a heap of scavengers' refuse, ashes, street sweepings &c., and the whole well mixed. This heap of refuse is made into a sort of "embanked reservoir," the semi-liquid slush being turned into it. After absorption and thorough mixing, the solid material is fit for use. The ashes, &c., absorb about two-thirds of their bulk of sewage—a cubic yard of manure being formed of two-thirds of a cubic yard of sewage slush and one-third of a cubic yard of ashes, &c. "The cost of the operation at the outfall is found to be 2s. 2d. per cubic yard of manure," 8d. being the cost of the ashes per cubic yard. The demand for it at the price of 2s. 6d. per yard exceeded two or three times the supply; so that, as Mr. Austin states, they intended to raise the price: 3s. 6d. per yard, it appears, would pay the cost of production, and the interest for the outlay for the buildings. The resulting liquid is said to be free from

all unpleasant odour, the same being found of the solid manure. Mr. Austin, however, thinks that modifications can easily be introduced, "so as to completely obviate the slightest inconvenience even in the hottest weather." What these improvements are we now propose to notice.

The sewage is, in the first instance, supplied to a large and rather deep tank, in which is deposited the chief proportion of the solid matters held in suspension. Between this and the next tank, which is much shallower than the first, a simple division (formed of basket-work and perforated boards in the centre) is placed; the liquid, by this arrangement, can only pass through from the first to the second tank at a certain depth beneath the surface, the whole of the division not being perforated, but only a portion near its centre. At the end of the second or shallower tank, filtering materials of different kinds are to be arranged, the sewage passing through these laterally. These filtering media should be, first, coarse screened gravel, burch, or broken stones; second, gravel of medium coarseness; and third, some finer material. "And there would be much advantage in having this filter shallow and broad, rather than deep and narrow; the surface-water would only pass away, and thus allow of further deposition from the main body before filtration. It would be subject to greater friction and disengagement of the solid matter and foul gases; and the filtering medium itself would be less readily clogged, and would be more accessible for cleansing without removal, as it could be turned over in its place, and subjected to a complete washing from a water-tank above as often as desired. A very small area of filter so placed would be found sufficient for all practical purposes."

After passing from the filtering media, the liquid sewage is subjected, in a separate chamber, to a stream of cream of lime from a height above. After the addition of the lime, it passes to a chamber much larger than that used at the Cheltenham Works, so as to allow of ample time for further precipitation before it is allowed to pass to the outfall. The admixture being made as the sewage flows into the reservoir on each side, a fender intercepts it, so as to prevent it disturbing the main body of the liquid. The discharge to the outfall is made over a weir, allowing only a thin film of water from which the lime has been precipitated to pass to the outfall.

There are two sets of tanks, &c., as thus described, one to be filled while the slush is being removed from the other. This removal is proposed to be effected by Mr. Austin in a much more simple way than is done at the Cheltenham Works. A double gangway, or railway of timber, is constructed above each line of tanks from end to end. On this a truck runs, carrying a windlass, by which the slush can be hoisted up in buckets; this being emptied into a receptacle also carried by the truck, and from which it is led by a shoot to be mixed with the heap of ashes laid alongside of the tanks. By this arrangement all flooring and roofing are avoided, a small covered shed only being required for the liming process to be carried on under, and for the protection of the tools.

Having now shown how the sanitary requirements of the question may be met in a measure almost completely, if not fully so, satisfactory, we have to explain how best may be met its agricultural necessities. This we propose to do in another paper. R. S. B.

THE PRESENT CONDITION OF AMERICAN AGRICULTURE.

Whatever may be the shortcomings of Americans, no one will be likely to charge them with a want of general intelligence. A reference to the statistics of newspaper circulation, book publishing, and common schools, would relieve them from such an unworthy imputation. And yet it may fairly be asked why, with this general diffusion of intelligence, is it that there is so little of an approach to a scientific course of husbandry? Why are there so few schools and colleges of agriculture in existence? Why do American farmers crop their land with so little judgment, that the average yield of wheat and other cereals in the older States has very rapidly decreased, whilst, during the same time, England has doubled her production? To these interesting queries we can give a ready reply. Until a nation has, by the necessities of its growth, acquired a realization of the fact that its farms cannot be maintained in fertility without a return of plant-food equal to the depletion caused by the removal of crops, we cannot expect to see much attention paid to scientific agriculture. This conviction will come sooner or later, as there is a more or less ex-

tensive territory in a condition to be appropriated by those who find their land becoming sterile, and lack the capital to renovate it.

It is useless to urge upon an American farmer the expenditure of sums for drainage, and special manuring, much larger than it would cost him to purchase a new farm and make all his improvements upon it; and hence is it that with a boundless area of land stretching westward, the farmer, driven from his homestead by his own mismanagement, and that of his predecessors, settles upon an unbroken fertile farm, and gives no heed to the man of science. So long as we have a sparse population, and a large area of arable land that can be had in fee for the nominal price of five shillings per acre, we may expect a comparatively tardy development of agricultural science. Meanwhile we have agricultural papers with lists of fifty thousand subscribers, and agricultural books are purchased in great numbers, and State legislatures establish Boards of Agriculture, and societies are formed in every township, and farm implements of wonderful capabilities are invented by hun-

dreds each year, and all things presage a coming good time, when we shall turn some of our national energy into the development of the science of farming.

Has it occurred to you that the invention of improved agricultural implements might, under some circumstances, be a positive national evil, instead of a blessing? We are really suffering from that cause at present, although our farmers do not seem to realize it, and our journals sing the praises of each new and more efficient tool. If Liebig is right, every bushel of corn exported from the farm impoverishes the soil. Now, if we use tools that increase our crops, and which enable us to remove them more readily, and we do not manure properly, or use a suitable rotation, we shall soon get the over-taxed farm to the verge of sterility. As the American farmer does not generally manage so as to maintain the fertility of his land, and does use the improved implements, he is actually taking to himself assistants to hasten on the day of his want.

When the peculiarities of our condition are fully understood, you will wonder, not at the little we have done, but that we have done so much. We have four agricultural colleges established, two of which are in actual operation, and, besides several others projected, there are professorships of agriculture in different universities.

The first effort to found a college of a distinctly agricultural character was made in 1838, by the late Judge Buel, of New York State, who proposed that the Legislature should make a fitting pecuniary endowment, and, although this was refused, he continued his philanthropic efforts until his death.

The project was again agitated by Dr. Beekman, a former president of the New York State Agricultural Society, by the Hon. Jno. Delafield, and others, until finally in 1856, through the exertions of Col. B. P. Johnson, Secretary of the N. Y. State Society (and known to many of your readers as Commissioner of the World's Fair, in 1851), and his associates, the State Legislature granted the sum of 40,000 dollars as a loan without interest, provided the like sum should be raised by individual subscription. This requirement was speedily met; a tract of 680 acres, lying on the shores of Seneca Lake, has been purchased, and an imposing edifice in stone is now in process of erection.

The young State of Michigan, with great enterprise and foresight, has come forward, appropriated a liberal sum, and actually erected and put into successful operation a College of Agriculture, while the older States were debating the *pros* and *cons* in the matter of their own need for such institutions. The first act was framed in the State Legislature in 1850. In 1855 a bill was passed for the purchase of land, and in 1857, by an amended act, the sum of 55,000 dollars was granted to defray preliminary expenses, and 40,000 dollars for current expenses for the ensuing two years. A tract of 676 acres was purchased in the vicinity of Lansing, the State Capital, the college buildings were erected, and in May, 1857, in the presence of the Governor and other State dignitaries, they were formally dedicated. The

corps of professors had previously been organized, and the first class opened with sixty-one scholars.

In 1855, the President and officers of the Pennsylvania State Agricultural Society decided to appropriate the accumulated moneys in their treasury to the establishment of an agricultural college and experimental farm. An act of incorporation was procured from the State Legislature; and donations received from various citizens in money, and from General James Irvin in land, placed the project in a prosperous condition. A recent legislative appropriation of 50,000 has been procured, one half of which sum is contingent upon the subscription of an equal portion by private individuals. The trustees have erected some of the necessary buildings, the school edifice being designed to accommodate three hundred pupils, and active operations on the farm have been carried on for two years past.

The State of Maryland passed, a little more than two years since, an act appropriating the sum of 6,000 dollars as a perpetual annual contribution towards the maintenance of an agricultural college, but conditionally upon the subscription of the sum of 50,000 dollars by individuals. A farm of some 450 acres has been purchased near Bladensburg, in Prince George's county, and preparations for the erection of the necessary buildings are in active progress.

The soil of the farm is of such a diversified character as will afford ample opportunities for experiments with various crops. For this, as well as for all the other colleges, importations will be made of animals representing the different improved breeds of cattle, sheep, and swine, and a museum of implements and products of all nations will in due course of time be founded.

At Cleveland, Ohio, an agricultural college has been in existence for a few years past, but it has met with little support, and is in a languishing condition.

In 1855, the State of South Carolina made an appropriation of five thousand dollars, to be expended annually in experiments with seeds, plants, and cuttings, principally received from the agricultural branch of the United States Patent Office.

An excellent institution has been founded at College Hill, near Cincinnati, Ohio, in which a regular course of general instruction is combined with a thorough practical and theoretical education in agriculture. The name "Farmers' College" has been adopted: it gains its support from a fund of 100,000 dollars, created by the sale of scholarships.

The State of Ohio is about duplicating the experiment of an agricultural colony for the reformation of vagrant boys, which has met with such success at Mettray, France, and confident hopes are entertained of a good result.

For ten years past an annual course of thirty lectures on agricultural science has been given in Yale College. The plan was originated by the late Professor J. P. Norton, for some time associated with your Professor, J. F. W. Johnston, and has subsequently been maintained by Professors J. A. Porter and Samuel W. Johnston. Professor Norton, at one time, attempted to give a special course of laboratory practice, but met with so little support as to be led to discontinue it.

In Massachusetts there is a State Reform School for vagrant boys, at which experiments in the cultivation of crops, the breeding of animals, and other departments of farm economy are made under the direction of the State Board of Agriculture.

The General Government has been greatly importuned to erect a Department of Agriculture, to be under the control of a Secretary, who should hold equal rank with the Cabinet officers. It is urged, that the agriculture of the United States is so pre-eminently the great national interest, that its advancement can only be promoted by a department especially devoted to it. According to the census of 1850, the number of the free male population engaged in agriculture was twenty-four hundred thousand, or forty-four (44.69) per cent. ; while the total number engaged in commerce, trade, manufactures, mechanics, arts, and mining, was only sixteen hundred thousand, or about thirty per cent. (29.72). The capital invested in agriculture was five billions of dollars, and that represented by all other branches of industry less than one billion. Why, then, say the advocates for an Agricultural Department, should this mighty interest have no representative in the Government, except a subordinate bureau of the Patent Office, under the management of a simple clerk and assistants? Our legislators, while recognizing the cogency of these appeals, still will take no steps towards the desired change, because they believe themselves restrained by the terms of the constitution.

A great public sentiment has, however, been forming for some years past, and we can scarcely fail to see the change made, when its paramount necessity shall be felt. At present annual appropriations are made by Congress for the collection of agricultural statistics, for promoting agriculture and rural economy, and for the procurement and distribution of seeds and cuttings, and a certain amount of good is realized therefrom by the country at large. A report is annually issued by the agricultural bureau, of which a quarter of a million of copies are printed by Government for gratuitous distribution by Members of Congress to their constituents. The first appropriation by Government for the diffusion of agricultural matters was made in 1839, at the suggestion of the Hon. Henry L. Ellsworth, then Commissioner of Patents, and amounted to the paltry sum of £200. The report for that year contained but fifty-four pages, and besides agricultural information contained other mechanical subjects.

The appropriations were steadily increased, and the volume enlarged, until now sixty thousand dollars are annually given, and the report has swelled to five hundred and fifty-two pages. If the clerk at the head of the bureau were more efficient, much better results would be attained; but we are better off with the little we have than we would be if nothing were done for the agricultural interest.

The bill of the Hon. Justin Morrill, providing for a grant of public lands to each State, for the maintenance of an Agricultural College, the features of which were given in my last communication, passed both Houses of Congress, but was vetoed by the President. The bill

passed the House, by 104 yeas to 100 nays, and the Senate concurred by 25 yeas to 23 nays, three-fourths of the members in either body from the Free States voting in its favour.

The President assigns as his reasons for his veto :

I. That the bill has been passed at a time of embarrassment, when we can with difficulty raise revenue sufficient to meet the wants of Government, and that its large grants of public land would effectually deprive the Treasury of a large source of revenue.

II. That it is not provided in the Constitution that the public lands may be given away without recompence, for such purposes.

III. That it would have the effect of making the several States stipendiaries upon the general Government, and thus makes a precedent that would be productive of disastrous consequences, in authorizing future appropriations for unworthy objects.

IV. That it would operate to the prejudice of new States, for their fertile lands would have been concentrated at low prices into the hands of speculators, and emigrants would be compelled to pay these men enormous profits, or chose some other locality.

V. That existing colleges would be injured, for the gratuitous instruction afforded at these State institutions would draw all young men to them, and the older colleges would be ruined.

In my capacity as an impartial chronicler, it is not fitting that I should enter into arguments to show the sophistry embraced in some of these objections. They commend themselves to each reflective political economist.

The Illinois State Agricultural Society, at an Executive meeting in February, passed the following resolution :
 "Resolved, that the Executive Committee offer the sum of three thousand dollars (£600) as a first premium, and two thousand dollars (£400) as a second premium for steam-engines suitable for ploughing, and other farm work. The simplicity and economy of their construction, and the practicability of their application to farm uses, shall be such that the machines can compete with animal power."

Thus your mechanics will see that we continue to feel a deep interest in the great question of steam-cultivation. Besides the plough of Mr. Fawke's, which was fully described in a former letter, S. K. Basset, of Galesburgh, Illinois, has invented a new steam-plough, in which the wheels of the truck of a traction steam-engine are so arranged that the truck may be readily guided and turned, and the engine rendered available for drawing a gang of ploughs to turn over the earth in the usual way. The invention also consists in a peculiar manner of attaching and applying the gang of ploughs to the trucks; also in the employment of track clearers, arranged in a novel way, and in so attaching the boiler to the truck that it is allowed to remain in a horizontal position when the track rises and falls in correspondence with the inequalities in the surface of the ground.

Our inventors, you see, as well as your own, are groping in the dark, making efforts to use the present unsuitable form of the plough-breast, by attaching to it some traction power, either a stationary engine, or a

peripatetic one, like *Boydell's* and those of our own invention. It is a great pity that they could not realize the force of *Mr. Hoskyn's* arguments, as given in his "*Talpa, or Chronicles of a Clay Farm.*"

I could not avoid noticing at *Chester* last summer the bulk and weight of your agricultural implements as compared with those which are exhibited at an American show. For instance, a potato-digger, which was said to be one of your best, weighed some eight hundred pounds, whilst our own will not much exceed eighty, and I scarcely think much better work can be desired than is ordinarily accomplished by the light tools we use. One of the most effective is that called "*Pitkin's digger.*" From a central rib curved fingers spread at either side, the spaces between them allowing the dirt to pass through, while the potatoes are thrown out, and roll together on the surface of the soil, midway between the rows. The centre rib and its lateral fingers are made on a curve, like a two-way or double-breasted plough, so that a furrow is turned, and the lower layers of soil, those in which the tubers are imbedded, are brought to the top, and the surface completely buried.

Your horse-hoe, the one employed for hoeing wheat and other cereals, is not even known to the farmers of America. We do not, in the first place, sow our grain in rows so straight as to admit of the employment of a horse-hoe; and furthermore, our farmers would think themselves unwarranted in an expenditure of labour, at one dollar per day, for a week or two, in clearing a crop of wheat. They are not yet good enough farmers to see that their interest lies in doing just as you do, and they never will see it until they feel the same pressure of circumstances. The horse-hoe used here for cultivating between rows of Indian corn, potatoes, and other crops having spaces of three feet between rows, is a very simple and yet efficacious tool. Its component parts are: a light wooden beam, a pair of handles, a pair of very small ploughs, attached to side-wings from the beam, a scimitar-shaped coulter on the former part of the beam, just behind the wheel and clevis, and at the rear end of the beam, and under the handles, a V-shaped edge of steel, with three fingers on either side of the standard, projecting backwards. The action of the tool is thus: The coulter in front steadies the motion of the tool, the little ploughs at either side throw a furrow towards the centre, or if you choose to reverse them, throwing a furrow at either side towards the row, the V-shaped paring edge cuts surface weeds, and at the same time spreads the ridge made by the side ploughs, whilst the fingers projecting from the back of the cutting edge comb out the loose weed in the disturbed soil, and leave them on the surface of the ground to wither in the sun. The tool costs but 32s., and will do as much hoeing in a day as twenty men.

The inventor of this horse-hoe is *Samuel A. Knox*, a Massachusetts mechanic. He has also, after a life-long attention to the manufacture of ploughs, discovered and patented a principle for the construction of breasts, the application of which has been attended with a large measure of success. Like all other plough-makers here and in other countries, he observed that a certain

definite curve of breast would wear more evenly, and accomplish the desired work with the least possible expenditure of force, and that this curve or twist should vary with the soil and the manner of laying the furrow-slice. A series of observation laid the foundation for a theory, and the theory he reduced to practice. It is essentially as follows:—Upon a good plough, while the breast is susceptible of any variation of curve in the direction of its height, still lines passing from any part of its rear to certain fixed points will be found to be straight. It is claimed by the inventor, and admitted by users, that in the forward travel of the implement, its propelling force results upon each particle of the soil as a momentum, and not as a continued force; for when stricken, each particle is thrown off at a tangent from the curved breast, which bears a strict relation to its elevation; but in no case is the particle rubbed continuously by successive portions of the breast, and therefore the furrow-slices are not compacted on their abraded surface. The principle is supposed to do away with the compaction of the furrow-slices in wet clays, and by equalizing the wear of the plough-breast, and exercising its greatest intensity at the flattened portions near the point, to maintain the figure in place of a continued retrograding variation, the abrasion going on equally over every part of the surface, and not being concentrated in parts to such an extent as to wear holes.

In justice to the inventor and patentee, I cannot enter more circumstantially into detail of the principle, but thus much I give to show that our peculiar mode of plough-building is not a mere crude experiment, but actually founded upon geometrical principles.

This mode of construction of course admits of all the variations necessary to produce longer or shorter breasts, of gentle or more abrupt curvature, with straight, or more or less convex or concave lines, laterally, as different soils or practical uses may require; and hence is as applicable to English ploughs as to American.

To such of your readers as are desirous of studying the statistics of American agriculture, I would particularly recommend a learned paper on this subject, read before the American Geographical and Statistical Society, by *John Jay, Esq.*, of this city, which has been issued in book-form by Messrs. *Appleton and Co.*, of 16, Little Britain, London, and may be had for a trifling sum. Taking the official returns of our Census as the basis for his arguments, the author, with signal ability, sketches the causes which have produced the rapid growth of the American Republic, and points out its future destiny as a food-producer for the continents which lie on either side of it. He gives suggestions for the preparation of the tables of the Census of 1860, which, if adopted by our Government, would tend to make our statistics almost as complete and instructive as those obtained by England, France, Belgium, and Austria. He justly remarks that "in the absence of official returns, the most accurate statements and approximation are to be found in the *Mark Lane Express*, and the London *Farmer's Magazine*; and are thence transferred to the columns of American newspapers, for the information of American farmers. Thus does in-

dividual enterprize seek and partially obtain those results which Governments alone can accurately furnish."

From accounts which are reaching us from different sections of country, we may infer that the crops promise well for a full harvest. Spring has come upon us unusually early, and winter grain, which had been severely injured by the unusual absence of snow, is feeling the effects of warm rains and sunshine. In central New York it is thought that it will get such a start as to be beyond the reach of the fly; but if we should have a sudden change, and, as has sometimes been the case, a "cold term" set in for a week or so of this month, great damage will be done to vegetation, which is everywhere in a forward state. In Maryland the reports are flattering, with the exception of grain on low lands, which has been considerably thrown out. The accounts from Virginia are conflicting; but, in the main, favourable. Pennsylvania, Missouri, and Kansas all give cheering indications of a bountiful yield. In Illinois the prospects are that an average crop will be obtained, the warm weather having worked a great change for the better—especially in the central and southern portions of the State. In January and February the accounts were peculiarly discouraging, a great part of winter wheat being supposed to be winter-killed, and some of the agricultural press seriously advised the farmers to cultivate Indian-corn to the exclusion of wheat, the latter being too uncertain. Now the *Chicago Tribune*, and other leading newspapers, say that the farmers are everywhere encouraged with their prospects. Michigan, Indiana, Kentucky, Tennessee, Mississippi, Louisiana, Texas, and the fertile States of Iowa, Wisconsin, and Minnesota give the same flattering hopes for the coming harvest.

The *New York Herald*, quoting the estimates for the crop of 1859 (as given in my former communication), corrects them by the light of our present prospects, as follows:—

	Estimate of Col. Johnson, as given in my letter.	Estimate of <i>New York Herald</i> .
New York	20,000,000 bushels.	20,000,000 bushels.
Pennsylvania	20,000,000 "	20,000,000 "
Virginia	18,500,000 "	20,000,000 "
Kentucky	8,500,000 "	12,000,000 "
Ohio	22,000,000 "	27,000,000 "
Indiana	13,000,000 "	20,000,000 "
Illinois	14,500,000 "	18,000,000 "
Other States	42,000,000 "	65,000,000 "
	158,500,000 bushels.	202,000,000 bushels.

Cotton promises well so far as accounts reach us from Alabama, South Carolina, and Texas. The *Mobile Mercury* asserts that the present crop of cotton will exceed the production of any previous year by several hundred thousand bales.

The *New York Herald* says the prospects for the sugar-crop of 1859 are decidedly gloomy, the stubble having generally failed. It gives the sugar-crop of Louisiana for the past ten years as follows:—

Crop of 1849	247,923 hogsheads.
" 1850	211,201 "
" 1851	236,547 "
" 1852	321,934 "
" 1853	449,324 "
" 1854	346,600 "
" 1855	231,412 "
" 1856	73,976 "
" 1857	297,097 "
" 1858	365,000 "

From the above it will be seen why the Chinese sugar-cane, or SORGHO, which was in 1856 and 1857 most prominently brought to the attention of American farmers, was so eagerly adopted, that, in a single year, at least a hundred thousand acres were put into cultivation. If it shall be found that this year's cane has been so injured by winter frosts as to reduce the sugar crop to the minimum of 1856, we may expect, with the aid of our three years' experience with the sorgho, to see western sugar-making undertaken to a very large extent.

As regards the cereal crops throughout our Western States, there has not recently been a year when a full harvest was of more momentous importance. The short crops of the two years past have caused a prostration of trade and enterprise of such extreme nature as to have reduced the price of land which in 1856 was worth fifty dollars an acre, to about twenty. Some five hundred millions of dollars have been expended for railroads, built solely to transport the products of western farms to Atlantic markets, and which, in consequence of the small quantity of products offered for transportation, and diminished arrivals of immigrants, as well as to internal mismanagement, are not paying either interest on their stock, or, in some cases, their running expenses. A full crop for the present year would set matters comparatively to rights again; and if once the farmers get out of debt, and can lay by a little money, the re-action, passing through all the links of the chain, from the small western storekeeper, and the jobbers and importers in our seaboard cities, would soon be felt at the end which is held in your cities of manufacture. If a general European war be impending, with what momentous importance is the question of food production in this country invested! To England, with her powers of production taxed to the utmost, her population increasing at the rate of a thousand a day, and her importations of breadstuffs to the amount of forty or fifty millions sterling annually; to France, with her four millions of inhabitants, who eat no bread because her large crop of ninety-seven millions of hectolitres of wheat leaves no overplus for them after feeding their thirty-two million compatriots; to Spain, whose central table-lands have by shiffler cultivation become overgrown with weeds and reduced in fertility; to Prussia, Austria, Belgium, Holland, and other States, where the increase of population is attended by a decrease of the breadth of land devoted to cereal produce—to all these the question as to whether we shall or shall not have a bountiful harvest is of great importance. And so, reflectively, to us, your wars and rumours of wars, your prosperity and adversity, your political changes and your commercial aspects, are all fraught with an infinite interest, and as carefully studied by intelligent Americans as the more immediate events which are transpiring within our own boundaries.

H. S. O.

New York, April, 1859.

POTS AND PEARLS.

The industry and ingenuity of man is ever on the stretch to secure for himself whatever is useful or ornamental, and even the destructive operations he carries on in the process of clearing and cultivation are rendered subservient to his advantage, whether in paring and burning the soil, destroying the fern or brush or timber-trees which encumber the land, and prevent the growth of more useful crops.

While the seas in the vicinity of Ceylon have just been frequented by thousands of adventurers, paying to the Island Government large sums for the privilege of seeking for the precious gems in the pearl-oysters which are brought up by the hardy divers, the new settlers in Canada and the wooded districts of the United States have at the same time been preparing "pearls" of another kind—more useful at least, if not as ornamental, as the oriental gem, and more certain in the pecuniary return from the land than the precarious lottery of the sea.

The £20,000 or £30,000 revenue derived by the Ceylon Government from the pearl-fisheries is not to be compared in its beneficial results with the quarter of a million sterling paid by the merchants of Great Britain for the ashes, alkali, and barilla of commerce.

The ashes of land-plants yield principally the salts of potash, such as barilla, while those of marine-plants afford a large quantity of soda-salts.

Potash is of great importance in the arts, being largely employed in making alum, soap, flint-glass, prussiate of potash, for bleaching, the rectification of spirits, and other purposes.

In North America, Russia, Van Diemen's Land, and other places, where timber is an incumbrance upon the soil, it is felled, piled up in pyramids, and burned, solely with the view to the manufacture of potashes. The ashes, when the heaps are consumed, must be sifted; and the larger parts, or charcoal, returned to the fire, and burned to ashes. These, as soon as the sifting is completed, are stowed away under cover, until it is desirable to commence the lixiviation.

The ashes received from the United States and our North American colonies contain a greater proportion of real potash than those from Russia and the Hanse Towns; and hence the difference in price is as much as 5s. per cwt. between them.

The simplest and rudest preparation of potash is called ash-balls in England, and wood-ash in Ireland, and is obtained by burning the common fern or brake, thistles, dock, or weeds of any kind. The reddish-grey ash, being carefully collected, is sprinkled with a little water, and then moulded by hand into balls from three to four inches in diameter, which, when they have acquired a certain hardness and solidity by drying in the sun, are ready for sale. It is an object of importance to determine the values of the carbonates of potash and soda met with in commerce, by ascertain-

ing the amount of available alkali they contain. The available alkali is that which exists in the free or caustic state, and that which exists as carbonate.

The alkalimetric processes usually employed are sufficient for appreciating the strength of the alkalies of commerce; but do not furnish any indication of the nature of these alkalies, as they do not distinguish pure potashes from those which have been mixed with soda. The Society of Pharmacy of Paris a few years ago offered a premium of £125 for the best treatise describing an easy and commercial process for recognizing the presence and proportion of soda in the potash of commerce.

The best pink Canadian potashes contain pretty uniformly 60 per cent. of absolute potassa, and the best pearlashes 50 per cent; the alkali in the former being nearly in a caustic state, and in the latter carbonated. All kinds of vegetables do not yield the same proportion of potash. The more succulent the plant the more it affords, for it is only in the juices that the vegetable salts reside, which are converted by incineration into alkaline matter. Herbaceous weeds yield more potash than shrubs, and shrubs than trees; and for a like reason twigs and leaves are more productive than timber. But plants in all cases are richest in alkaline salts when they have arrived at maturity. The soil in which they grow also influences the quantity of saline matter.

On many kinds of soils in North America the burning of timber has a beneficial effect, which may be ascribed to the agency of heat and the potash supplied from the ashes. All plants contain alkali, either potash or soda; hence salts of these alkalies are constituents of many of the best manures; and the ashes of plants, rich in alkaline, have always a beneficial effect when applied to land. The earthy phosphates and alkaline salts are the most important of the salient constituents of manure.

The trade in potash and pearl ash has a particular, as well as a general, beneficial effect upon the interests of the settler in the woods; and the very obstruction to cultivation is frequently converted to purposes of immediate and direct gain. This branch of Canadian industry might be more extensively engaged in, with profit, as there is a steady demand for the product, at remunerative prices. It is largely manufactured in Lower Canada, some of the wealthiest *habitans* (or French settlers) being extensively engaged in it. It requires but a small capital, and the time occupied in the process is very short. There are millions of bushels of wood-ashes wasted in Upper Canada, which might and ought to be turned to good account. At present large quantities of ashes are collected in Canada by the Americans, and carried to Ogdensburgh and elsewhere, to be there manufactured into a valuable article of commerce. The export of pot and pearl ashes from Canada need to be very considerable. Twenty years

ago 179,000 cwts. were shipped; and this quantity was exported even down to 1843 and 1844. Now, however, the shipments rarely reach 150,000 cwts.

Many emigrants arriving in Canada with scarcely sufficient means to purchase an ordinary farm, might engage in the manufacture of ashes to great advantage. The ordinary risks of agriculture in such a climate are avoided. The yield is certain, while the price is remunerative. To show the importance of this branch of Colonial business, we give a few statistics connected therewith. The barrels of ashes average about five cwts.; and the exports from Canada, in the last ten or twelve years, have averaged about 30,000 barrels, worth about £250,000. The shipments from New York of both pot and pearl ashes have been as follows:

1837	.....	29,680	barrels.
1840	.....	23,966	„
1845	.....	56,291	„
1850	.....	35,263	„
1855	.....	14,287	„

There are inspectors appointed at Montreal, Boston, and New York, to certify the quality of the ashes, pot and pearl, which are each classified into three grades. About 3,000 barrels are annually inspected at Boston.

The heavy hard wood timber chiefly burned on the land in clearing in Canada, is elm, maple, basswood, large birch, and brown ash. The same use can be made of all others that can be got; but those named produce the best and the largest quantity of ashes. In order to keep it uninjured from wet or damp, when the timber is burned the ashes may be collected in a bin or safe, made of small logs, floored with logs or boards, and covered over-head from the rain. The ashes should not be put in or near a house, lest if put in hot they might burn the building. They have been known also to take fire if vegetable oil be poured on cold ashes. In such a safe or bin they may be preserved until sold or otherwise disposed of; and if a fair price can be obtained for them in this state, it is better for the new settler to sell them than to boil them himself, if he is not accustomed to the process. The older settlers manufacture their ashes for sale to the country merchants, into what is called the "salts of lye," when there are no purchasers convenient to buy them before taken through any such process. To effect this, they provide themselves with two or more deep tubs, called "leeches," which hold six or eight bushels of ashes, with a spigot in the bottom. These are placed on a stand a foot or two from the ground, with troughs underneath them, to receive the lye when it runs off. A few bricks, stone, or a handful of brushwood are put inside over the spigot, on which is placed a little straw, to prevent the ashes running through or rendering muddy the lye. Over this the dry ashes are placed, nearly filling the leech, and gently pressed down, on which is poured boiling water for the "first run," that is until with it the ashes be perfectly soaked through: cold water may then be used until the strength is taken from the ashes, which is known when the lye running off is weak like water. Two or more kettles or pots are hung over a fire to boil down

the liquid that has run from the ashes, one boiler being kept filled from the lye running off the ashes, until all gets boiled down to the consistence of tar, which when cold is as hard or harder than pitch. This substance is called salts of lye, and is the pot or pearl ashes in a crude state. It is readily purchased by all Canadian country merchants, who have works in which it is heated in a furnace until it becomes nearly white, whence its name of pearl ash. The ashes saved from an acre of good hard-wood land will produce three or four, and in some cases five cwt. of salts. A handy man will boil 1 cwt. a day, and about 16 bushels of ashes will produce so much.

This resource is a great advantage to the new settler, as it affords him some cash for clearing off his land, by producing an article for sale which is always in demand, from what would otherwise be thrown away as being of no use to newly-cleared land.

Sir Wm. Denison, Governor of Tasmania, in some experiments which he caused to be carried on in that island, found that the proportion of ash obtained from the wood and bark of the trees of that island varied according to the description of timber from 10 to 25lbs. per ton. The general yield of potash is about 1lb. to 10lb. of ash. Upon a rough computation the quantity of timber, including leaves and branches, in a heavily-wooded district of that colony, is from 600 to 1,200 tons. If, then, the quantity of ash be taken on an average at 10lbs. per ton of wood, the weight of ash will be from 6,000 to 12,000lbs., and the quantity of potash from 600 to 1,200lbs. per acre. The value of the potash in the home market is now from £33 to £40 per ton.

FROST CONDUCTORS.—Mr. J. Bruce Neil, in a letter to a contemporary, states that the blossoms of fruit trees, which are often so fatally cut off by early spring frosts, may be protected from them and all their pernicious effects, by the following method: If a thick rope be intermixed among the branches of a fruit tree in blossom, the end of which is directed downward so as to terminate in a pail of water, should a slight frost take place during the night, it will not in the smallest degree affect the tree; while the surface of the water in the pail which receives the rope will be covered with a cake of ice of more or less thickness, though water placed in another pail by the side of it, at the same time, by way of experiment, may not, from the slightness of the frost, have any ice at all on it. The principle in particular, as Mr. Neil justly remarks, is deserving of much consideration, as there is a possibility of its being very beneficially applied in a great variety of obvious ways. In preserving apples, during long and severe winters, the same authority states, that it is only necessary to throw a *linen* cloth over them, before the approach of frost (woollen cloths would not answer), when they will be found entirely preserved, how severe soever the winter may prove. There seems abundant reason to believe that even potatoes might be protected from frost (*after* being smoked) by some such similar expedient. This, also, like the above principle, to which it appears so very analogous, merits high consideration; and for the same important reason, its capability of conducing to the universal benefit of mankind, and the numerous animals under our protection.

THE DEFECTIVE STATE OF FARMHOUSES AND FARM BUILDINGS IN THE COUNTY OF DURHAM.

During the recent annual fair at Durham, the Council of the County Agricultural Society, and other influential agriculturists of the neighbourhood, dined with Mr. Spearman, at Newton Hall. This being the fourth anniversary of these gatherings, they have begun to assume the character of perennial as well as annual, and as the numbers assembled greatly exceeded that of ordinary parties, we have been anxious to be permitted to advert to them, the more especially as the discussions that occur, and which it is one of their chief objects to promote, often have an important bearing. Leave has been accordingly given us on the present occasion to take this notice of them, and, at the same time, to give publicity to what fell from Mr. Spearman on the important topic of the general defective state of farm-houses and buildings in this county.

Mr. SPEARMAN introduced the subject by saying he was afraid gentlemen at the other end of the room had not heard a good story which had just been told by his friend on the left (Mr. Wetherell, of Aldborough) of his having been almost afraid to allude to a great calamity that had befallen an acquaintance of his, in the shape of his having had his homestead burnt down, until the sufferer put him at ease by saying, with a smiling face, "Why, between ourselves, it is no such a *bad job* to have a set of old buildings burned down, which happen to be pretty well insured." Now (said Mr. S.), I take leave to say I believe in my conscience it would be a very *good job* if half the farm buildings in this county were to be burned down, and that almost whether insured or not. He was satisfied he should be borne out by those he addressed, when he said that nothing could be more deplorably defective in every sense of the term than the great majority of the farm-houses and buildings in this county. They heard landowners constantly expressing their wish to induce men of capital to become their tenants, and nothing could be more rational. But did they really expect that men of capital, of education, and intelligence were to be induced to become the occupants of such habitations and buildings as, generally speaking, were those which alone these landowners had to offer? No doubt there were agricultural enthusiasts, like a fox-hunting friend of his who, having undertaken the hunting of a subscription pack, said, "Never mind a house; I can live in a loft, but let me have a first-rate kennel and stables!" and who would say, therefore, "Never mind house, as long as the buildings are first rate." But my friend was a jolly bachelor, as I suspect would be the case with the agriculturists I have alluded to. It is otherwise with married men; and he took leave to say of the families of that class of farmers of whom he was speaking, that they required and deserved as good houses as could be obtained for them. As regarded well-constructed and sufficient farm buildings, they were as absolutely essential towards conducting farm business with credit and success as are manufactories and mills towards carrying on the business of our great manufacturers; and what would any of them say if they were invited to become the tenants of buildings totally unequal to their requirements? Why, that the inviter was one of Bedlam's out-pensioners. True it was, that in times past, at least, it might be said by some landlords, that their estates being entailed on their eldest sons, if they laid out money on farm buildings it was enriching them at the expense of their younger children, for whom it was their duty to save a provision. Clergymen

might say they were but tenants for life, and their children will have nothing to do with their benefices at their death. Others, again, might say they had no wives nor children, and did not choose to cripple themselves for the sake of those who are to come after, who might be well satisfied with the property being left them at all. But, gentlemen, times are changed, and all these objections may now be met. In the case of clerical persons they have been enabled, by Act of Parliament, to charge upon their benefices the cost of agricultural improvement, to be borne as well by their successors as themselves. As regards the other description of landlords whom I have mentioned, they have been enabled, by the establishment of late years of a very important institution, to obtain pecuniary aid, and this not merely for the purpose of draining, which is afforded by the Government, but for that of agricultural buildings. An annual charge is created upon the property in respect of which the advance is thus made, including interest and a payment towards extinguishment of the debt, which is thus liquidated in a given time. He alluded to the West of England Land Improvement Society, established by Act of Parliament, under which the advances made by it took priority over other charges, which enabled it to dispense with inquiries into title. He was sorry to have to confess that on his own property the farm-houses and buildings are quite as bad as on that of his neighbours, though he had long contemplated reformation, and was going now to set about it in good earnest. He had, in the first instance, purposed effecting this at his own cost; but it afterwards occurred to him that as regards one set of buildings he might be doing a service by trying what in this county he believed was an experiment—namely, that of applying to the West of England Land Improvement Society for aid. This he intended, therefore, to do. With reference to the projected buildings themselves, he begged also to be allowed to say a few words. He had known instances not infrequent, of landowners proceeding to erect farm-houses and buildings under the advice of architects and builders—the result being very pretty things, architecturally speaking, but which, when submitted to the criticism of practical agriculturists, had been found anything but what, had they been consulted in the first instance, they would have suggested, though perhaps infinitely more costly. He proposed, therefore, to reverse this order of proceeding, and before he called in architect or builder, to take the advice of some of his experienced agricultural friends—some of them whom he saw present had already promised their assistance. When he should have shown them the site he had selected, which he had chosen as being central, but also as being close to the best roads, a matter in his opinion not always sufficiently attended to, and furnished them with the precise quantities and proportions of arable and grass land, as determining the number of draughts and consequent amount of stabling, the extent of cattle-sheds, feeding houses, and barn room, he should request them to say what, under the circumstances, if about to occupy such a farm, they would desire to have as regards extent and arrangement of farm buildings. The farm consisted of about 500 acres, and the site of the buildings was close to the highway from Durham to Hartlepool, which runs through the farm. When they sat again, as he hoped they should do next year, he expected he should be able to report satisfactory progress

and he ventured to say that he should have established, if not quite "a model farm," yet one at least that would serve as an example and specimen of what could be done, proceeding on the principles he had mentioned, and with the aid of the West of England Land Improvement Company. He sincerely believed that institution capable of rendering great service to the landed interest, which had not hitherto been invoked as he hoped it hereafter would be by the landowners of this district

THE IMPORTANCE OF PROPER AND PERMANENT CULTURE OF MANGOLD WURZEL.

Mr. Scott, of Broom Close, recently gave a lecture at Boroughbridge, on the "Cultivation of Mangold Wurzel," as a root now occupying so much the attention of farmers generally. The following is from Mr. Scott's paper:—

"Gentlemen,—I can assure you I feel no little diffidence in bringing before you the subject I am about to do, as it is, perhaps, one of the most important connected with our avocation, forming, as it does, one of the grand principles of agricultural economy; for not only is the root crop of essential value in itself, but it also lays the foundation, and forms the basis of operations for the succeeding cereals. The failure or success of its cultivation must not only be of vital importance to the farmer, but must materially affect the interests of the community at large. I will endeavour to the best of my ability to give you the results of my observation, and lay before you the conclusions at which I have arrived, from my experience in the cultivation of root crops; trusting you will not forget that the difference in soils, climate, situation, &c. must be taken into consideration, and that you will apply only to your use such of my principles as seem to meet your own individual cases. As *mangold wurzel* appears to be causing quite a revolution in the cultivation of root crops in the North of England, I will commence with that invaluable root. The words *mangold wurzel* signifies the 'root of secrecy;' but I flatter myself, we shall soon apply a very opposite term, namely—the 'root of plenty.' We read that this plant was first introduced into England more than three hundred years ago from Germany, where it had been some time used for cattle-feeding and sugar-making purposes. We are told that the ancient Greeks held it in high estimation. In its native climate, which is warmer than that of England, the mangold fares much better, and grows to a larger size than we have yet been able to produce it. Yet the seasons of late have so far favoured the extension of its culture in our own country as to displace, to a great extent, Swedish and other turnips, and are more certain, whether on soils excessively strong or silicious: yet I fear some of our sand-land neighbours are over-doing the thing by growing the breadth they are wont to do, unless they take means to consume at least one-half of the roots on the land upon which they are grown. And even this method would be discounting the roots, as they are never at perfection until April, at which time the farmer ought to have the land sown with grain. I have occasionally drilled alternately every 8 or 16 ridges (the latter I prefer), and consumed the turnips on bay sheep; and, by placing the cake or corn troughs on the naked ground, no difference was perceptible in the succeeding crops. In preparing land for a mangold crop, which should invariably succeed a cereal crop, the scarifier should be applied as early as convenient, after the removal of the sheaves. For this purpose I would particularly recommend *Coleman's cultivator*. I would urge the necessity of arresting the onward progress of couch, &c., at the earliest opportunity, for these penetrate the soil in a most surprising manner when divested of the grain crop. I remember having proved this during a

fickle harvest. I had sown the wheat crop in straight rows, and had skimmed between them to the depth of two inches, which was sufficiently deep to go below the vertical roots then ready to penetrate the earth. About three weeks elapsed ere the remainder of the field could be skimmed; when, instead of two inches, the shares had to work 3½ in., in order to undermine the twitch roots. The surface cleaned, we proceed to the next operation, viz.:—that of ploughing. But, previous to this, which ought to be done in November or December, the fold-yard manure should be applied over the surface; for this I think is now a settled question, that autumn or winter manuring is decidedly preferable to applying the manure during the dry months of spring, at the time of sowing. My own experience has satisfactorily proved to me that this is a step in the right direction in modern farming. By adopting the latter-named period for manuring, thousands of acres of stiff soils might be made available for a root crop, which a course of spring tilling prohibits. After dashing the manure, and ploughing to the depth of eight or nine inches, with a ploughshare not less than 9 in. in breadth, as soon as possible, especially on strong soils, turn back the furrows, and draw the ridges—a plan indispensable on retentive clays—if even done when the soil was apparently too wet for the operation; for with all that mechanical science has done for us in producing efficient machinery and implements, by which extraordinary achievements are accomplished, we have, as yet, no means of pulverizing the soil so cheaply and so effectively as is done by *atmospheric influences*. Should the winter prove favourable, the ridge harrow might be applied, and any roots or weeds gathered off, and the ridges reversed; but, should the weather not admit of ridging during winter, the surface, pulverized by the frost, should not be lost sight of, but the root crop drilled on the 'flat.' If on a soil of medium texture, and not ridged during winter (which ought to be accomplished if possible) the furrow slice should be ploughed early in March, afterwards crossed by a grubber or plough; but in no instance should a cross ploughing take place previous to a second longitudinal one. Having arrived then at the season of sowing, which should commence (weather permitting) about the middle of April, the land having previously received from six to eight cwt. of salt per acre—an indispensable application for mangolds—the ridges, if not already drawn, should be formed 26 to 28 inches apart, and the guano (if any) sown in the drills. But I would caution my brother farmers against using guano along with fold-yard manure, for, after various experiments, I am convinced that we do not get pay for the guano when so used; that is, the extra produce of bulbs does not compensate for the extra cost. The farm-yard manure, therefore, should be used alone near the homestead, and artificial alone at a distance from the same, which would effect a considerable saving in carriage, the cost of which many farmers underrate; for, if we have to grow wheat at 40s. per quarter, we must, in addition to growing the greatest possible amount of produce of every description, studiously avoid *superfluous* horse and

manual labour. The varieties of mangolds of which I have any knowledge are the orange globe, the long yellow, the red globe, and long red. These I have tested; two of which I have frequently had in juxtaposition--having first grown mangolds in 1848. Of the foregoing I decidedly prefer the long yellow for giving whole to milch cows or ewes; but, as there is an inconvenience in slicing them, some orange globes might be grown for cutting for cattle or sheep: but the one thing for which I recommend the former is that they draw so much cleaner than the other descriptions, especially on adhesive soils I think, too, a greater weight of produce may be grown; for in selecting the largest bulb of each sort at the time of harvesting, the weights were as follow:--Long yellow, 29½; globe ditto, 28; red globe, 25½; and long red, 18½. Of the analysis I am ignorant, and cannot, therefore, offer any information on that head (and as quantity is but one element of value, we must not be too sanguine as to which is the most profitable description; for it may be in this case as in swedes, since we have ascertained that our East Lothian green-topped swede of 6 lbs. weight contains as much beef-making material as a Skirving's of 9 lbs. So the conclusion arrived at is, that the latter is only calculated to fill the eye and not the pocket). A pair of ridge harrows, where the land is at all cloddy, ought to precede the drill. I will not here enter into the merits or demerits of the turnip drill; but, after four years' trial, I am convinced of the advantages of the water-drill. A shower of rain after the seed is sown is looked upon as a great boon; and if we can accomplish this by mechanical means we are not so dependent on the heavens. Moreover, I maintain that it is utterly impossible (except with Chambers's distributor) to have a regular stream of manure from a dust-drill. If, therefore, you are intending to apply 3 cwt. of super-phosphate, for instance, you, in a drilling, have perhaps 1½ cwt. on one portion of your field, and 4½ cwt. on another. As to the quantity of seed, from

5 to 6 lbs. may be sown in a dry state, if sown in April; but if late, in order to make up for lost time, the seed should be steeped in lukewarm water from 24 to 48 hours, and when used should be dried in fine coal-ashes, &c. As the seeds are slow to vegetate, from having to break open the hard capsule, in almost every instance on light soils the ridges will be covered with annuals before the legitimate plants appear. A pair of ridge harrows, divested of the centre teeth, should, therefore, be passed along the ridges on a dry day. This will have the desired effect of destroying the major portion of the weeds, without injuring in the slightest degree the infant plants of mangolds, even if they have appeared above the surface; after which the horse-hoe must be liberally used, the soil being removed as close as practicable to the plants, which greatly facilitates the operation of *hand* singling. The plants should be left from 18 in. to 20 in. apart, remembering to have some plants in reserve, to dibble in the vacant places, which should be done on the first wet day, by making a hole with a piece of wood, taking care that the hole is sufficiently deep to receive the rootlet without turning the tip thereof, which would retard the growth, and in some instances destroy the plant. One of the great secrets in producing large bulbs is to allow them sufficient space in which to grow, and when we find that one bulb of 9 inches diameter is equal to 27 bulbs of 3 inches in diameter (the whole of them being spherical), I think we ought to feel fully justified in allowing them sufficient space to throw out their leaves, in order that the roots may be fully developed. It is a custom with some men, when the crop is pretty well matured, to divest mangold of the under-leaves. Now this is a mistake, for the leaves possess no feeding qualities to justify the commission of so much injury being done to the crop. As the storing of roots forms a distinct subject, I will not now enter upon it.

SWEDES AND MANGOLDS.

SIR,—Mangold-wurtzel and the swede turnip are two of the most valuable root-crops grown in England; root-crops are the main-stay of all good and profitable farming; and manure is the foundation of good and heavy root-crops. On this account, wise men say that vast attention ought to be paid to ascertaining the strength of the manures upon which our crops are built. Common sense says that, if artificial manure is but one-fourth its proper strength, we cannot expect from it more than a quarter of a crop in weight. Farmers who half-plough, half-manure, and half-clean their land, cannot expect to have whole or large crops, but only in proportion to the strength of the manure applied, which must depend on its composition.

The *Farmer's Magazine* has done wonders for many farmers: nay, it has shown that all good farming is founded on common sense and reason; and proves that 40 tons of swedes per acre, topped, tailed, and cleaned, have been grown, each turnip being allowed a space of 28 inches by 10 inches, and thus taking up 280 square inches of room. If planted regularly, this would give 22,402 turnips, which, at 4lb. each turnip, would amount to 40 tons 8lb. per acre. And 64 tons of mangold-wurtzel per acre, when topped, tailed, and cleaned,

have been grown by a celebrated market-gardener at Fulham, to decide a wager of £5, which the gardener won. They were planted each in a space measuring 2 feet by 1 foot, each root taking up 288 square inches. There would thus be 21,780 plants or roots upon an acre; and each root must have averaged a little over 6lb. 9 oz., to make 64 tons per acre. The gardener's land is manured yearly with the strongest horse-dung he can obtain, made principally from corn. All this plainly shows what the strongest manure will do in producing great root-crops.

Perhaps the following calculation may be useful to some of your readers: Swedes or mangolds planted in spaces measuring 28 inches by 10 inches, at 3lb. each plant, would amount to 30 tons 6lb. per acre; at 4lb. each, would be 40 tons 8lb. per acre; at 5lb. each, would be 50 tons 10lb. per acre; at 6lb. each, would be 60 tons 12lb.; and at 7lb. each root, a crop of mangold-wurtzels would amount to 70 tons 14lb. per acre.

Facts and figures combined greatly enlighten the mind: Science is weighty; when added to practice, is mighty.

Millfield, Peterborough, May 3. SAMUEL ARNSEY.

THE STEAM-PLOUGH, AND ITS PROGRESS.

It is comparatively easy to put the general advantages of steam power. Any such problem has already reached a solution. We thrash, clean, and grind our corn—bring home, feed, and sell our stock—all by the aid of that now indispensable agent. Indeed, a homestead without an engine would by this be considered as half furnished as the house without a mistress, or the parish church wanting a parson. Of course there are still several minor matters scarcely as yet brought within the scope of its operation. But these are all bound to follow; and we shall soon grub up our roots, pump our water, warm our cattle in winter, and cool them in summer, as methodically as we cut chaff or winnow wheat. In an agricultural point of view, steam has only one grand difficulty remaining to contend with. No wonder, then, that the recent discussion at the Farmers' Club centred almost entirely here. Everything else was pretty well taken for granted. Much had already been accomplished; and if we could only achieve this, as much more must follow. Once realize ploughing by steam, and drilling, draining, hoeing, and other similar descriptions of farm-work would come "naturally." But at this point we stop. The very Alps of our march onwards have yet to be crossed. And old Bowler eats his corn and frisks his tail, as much as ever the pride and pet of boys and horse-keepers.

However near we may actually be to a consummation of our hopes, it is very palpable that the practice of steam cultivation is yet in the hands of enthusiasts and patriots. True enough that Mr. Smith can count up a certain number of friends and neighbours, who are really adopting the system. But it is remarkable, on the other hand, how the great body of farmers hold off; and the leading men more particularly. Authorities who have ever been ready to give to anything of promise a trial and a chance, are by no means so ready now. Even the exciting and highly-seasoned correspondence of some time past has failed to arouse them. The usual commentary appears to be: "Let them fight it out." And the agriculturist waits, like a cautious jockey in a race, allowing the hot-headed and impetuous to weary each other out, and then coming up to win. Sound and prudent as this Fabian policy may be, it is, for many reasons, to be regretted. It is much to be wished that even at this stage the class chiefly concerned could be induced to take a little more active interest in the question to be solved. Inquire of our great manufacturing firms, from whom they have received the most valuable hints and instructions for perfecting their inventions? Almost invariably you will hear, in answer, from the farmers themselves—from those who have gradually tested the value and capabilities of the implement in everyday work, and learnt, with its uses, at the same time its drawbacks and defects. It is by the same

means that we shall make steam-cultivation a practical fact. Much certainly has been done in this way already by such men as Mr. Smith and Mr. Williams. Much assistance again has been proffered them by the more strictly professional mechanist; but the culminating point—the strong and hearty pull to land them at the top—must come from the hand of their own order.

And this brings us to the weak place in Mr. Mechi's paper, as read before the members of the Farmers' Club. That it was got up by a man with his heart in his subject no one who reads it can for a moment deny. That it was prepared with much ability and industry everyone will be equally inclined to admit. The figures were as telling as figures well can be, and the general argument and deduction honest and sound enough. What, however, was the substance of this deduction? It would, of course, be impossible for a progressionist like the worthy Alderman to talk to a body of farmers without scolding them; and his charge against them now is that they do not evince sufficient readiness to avail themselves to the full of steam power. Notwithstanding all this had accomplished for them, they did not go on with it as they were warranted, or as other classes of the community had done. Surely the lecturer's own acuteness would furnish the reply to such a complaint. He has studied the English yeoman's character long enough to know his proverbial caution, and the *festina lentè* pace of his proceeding. And so, when, for the nonce, the Alderman stands once more with a scroll in his right hand, as the embodiment of progress and improvement—the very high-priest of Ceres—vaticinating as the Oracle, "Level your lands, pull up your hedges, sell your horses, and buy a steam-plough"—a classic chorus of countrymen surrounds him, shouting, "Will it pay?" "How can you do it?" and "Let's see it first."

If Mr. Mechi himself was not here equal to the occasion, the speakers who followed him did little to help him out. Almost the only members who addressed the meeting had each some several plan of his own, at least identified with his name; and we had in turn, accordingly, Mr. Williams, Mr. Fowler, Mr. Hall, and Mr. Halkett. The one chief witness was wanting—the farmer in no way associated with the inventor or patentee, who *had* practised steam ploughing, who *had* sold his horses, *had* grown a quarter an acre more, and reaped all such similar advantages. However energetically Mr. Fowler, Mr. Smith, or Mr. Williams may talk and work—and it must be conceded that they are equally ready at either—they must feel as strongly as we do that it is not from their own mouths we must be convinced of the efficiency of their systems. If any one will but once show a lead, we may follow. Now we all hear, more or less directly, of there being tenant farmers who have really taken to cultivating their lands by the use of steam-

power; who have already lessened the strength of their teams, and who believe they have increased their production by the process. But we don't hear or see any of these at the Farmers' Club. Unfortunately, neither Mr. Smith nor his representatives, the Messrs. Howard, were present; although, if they have anything of this kind to tell us, they should have been. It is the common fate of inventors and enthusiasts to be considered too sanguine; while, if Mr. Mechi had only demonstrated what one farmer had done, in place of going to his more congenial task of denouncing all those who had not done, he might have been far more effective. That steam-cultivation *will* come, everybody is quite ready to admit; the point to prove now is, that it *has* come.

Our lecturer himself, be it remembered, goes beyond his own mark. With all his enthusiasm and ambition to "show a light," there is as yet no steam-plough at work at Tiptree. Even if there were, we should be rather inclined to doubt the great force of the example.

Too much credit can scarcely be given to his Royal Highness the Prince Consort, who is about to put both Fowler's and Smith's apparatus in work. This, at any rate, a hint for other landowners, who have been quite as reluctant in the business as any of their tenants. In fact, both are alike holding back for some more positive demonstration. We think this, even thus early, might be supplied. Piquant as the mutual abuse of the rival houses may be, we fear the proof will rarely be accepted in such a form. On the other hand, if a man can calmly assure his fellows that he has tried the experiment with economy, convenience, and advantage, there are hundreds and thousands only waiting for the signal. Mr. Mechi wrote his subject, "The Advantages of Steam in Agriculture: how far they have been availed of." To a certain extent we all knew how far. The very marrow of the matter went beyond this; and the one striking want of the paper, as well as of the subsequent discussion, is some such "a modern instance." It might have been commended.

LONDON, OR CENTRAL FARMERS' CLUB.

STEAM IN AGRICULTURE.

The ordinary monthly meeting of the members took place on Monday, May 2. Mr. THOMAS, of Bletsoe, presided, supported by Messrs. T. Owen, Spencer, Skelton, H. Trethewy, J. J. Mechi, J. A. Williams, W. Fisher Hobbs, J. Russell, P. A. Halkett, J. Fowler, jun., Collinson Hall, J. G. King, J. W. Paul, L. A. Coussmaker, E. Purser, W. Cheffins, J. Purser, W. Heard, J. Tyler, H. Shotter, J. Cressingham, James Wood (Sussex), J. Wood (Croydon), J. Parkinson, D. Drakeford, C. J. Brickwell, T. B. Browne, W. Eve, E. B. Acton, Smallbones, D. Christie, Bazin, D. Reid, J. L. Baker, J. W. Squier, W. Carr, J. Smith (Stevenage), W. H. Venn, &c., &c.

The subject to be introduced by Alderman MECHE was, "The Advantages of Steam in Agriculture, how far they have been availed of."

After a few introductory remarks from the CHAIRMAN,

Mr. MECHE said: I purpose, first, to review the general benefits conferred by steam, to estimate the extent of its use in our manufactures, locomotion and mercantile marine, and to see in what relation, in this respect, agriculture stands to the other industrial occupations of the kingdom. I shall also glance at the progress of steam culture, recognise with gratitude the merits of its early pioneers, and indulge in an opinion of what our use of it in culture ought to be, and ultimately will be. I shall also consider the question of fixed or portable engines, the value of steam for irrigation and drainage, on what sized farms an engine will pay, and add some practical hints about steam-engines and boilers. Nine years ago I addressed a rural audience on this subject with the following introduction, which so exactly represents my present feeling that I re-

peat it: "Steam; mighty steam! The term suggests a thousand pleasing and profitable reflections: that marvellous and almost invisible power which brooks no opposition—which never tires. Scouring the plains, piercing the hills, threading the valleys, and ploughing the wide ocean; mastering, with indignant ease, time and space, wind, water, and seasons; the varieties of its power may well amaze us. Here it is wielding the ponderous hammer that gives shape and consistence to gigantic metallic masses; there it weaves the gossamer web, or twists the slender fibre; it plunges the hardy miner deep into the bowels of mother earth, and raises from her lap her mineral and metallic treasures; these glow and flow with liquid meltings at its powerful blast; here it is printing bank-notes, there it is coining golden sovereigns; to-day it is preparing food and clothing for the body; to-morrow it feasts the mind, spreading far and wide, in countless numbers, the broad sheets of intelligence. Instruments of death and of preservation alike acknowledge its power. What a comprehensive word is this said *steam!* It means peace, progression, civilization, education, abundance, and cheapness; it is the death-blow to monopoly and privation. Ignorance and prejudice shrink away at its approach: the iron barrier of separation is broken by it; the interposition of time, of distance, or of poverty no longer wounds the tender affections; it increases alike our political power as a nation and our morality, for the increase of physical comfort must, in a Christian community like blessed England, predispose to moral good. But if this all-pervading power clothes the body with elegance and cheapness, and stores the mind with knowledge and intelligence, can agriculture alone escape its influence? Impossible. It must and will feed, as well as clothe,

the people cheaply. The landlord or the farmer who saves his time and his money by the concentrated power and speed of a hundred horses on the rail, or five hundred on the ocean, must draw comparisons and conclusions adverse and disparaging to our present slow and crawling system of agricultural mechanics. The general application of steam in agriculture involves a thorough change and reformation of our farming system. It is a question of more capital and less land, both for landlord and tenant. It is a question of a compensation for unexhausted improvements, or an ample protection of tenure by lease; and it is a question of public registration and easy transfer of landed property. It will compel a more accurate observance of the laws of mechanics, and will sharpen the intellects of the agricultural labouring community. In a word, the employment of steam-power in agriculture will compel or induce a larger employment of labour and production of food. Drainage, deeper cultivation, open fields, good roads, better buildings, more live stock, and less weeds, must and will be the concomitants of agricultural steam-power; for steam-power means amendment and progression. It would be a curious statistic could we accurately know the number of horses that would be required to produce a power equivalent to that now in action by our fixed, locomotive, and marine engines. I apprehend that, if the whole surface of England were sown with oats and cropped with grass for hay, there would not be enough to feed the requisite number of horses; and if there were food enough we must have whole towns of stables, streets of harness-makers, and squares of farriers and veterinary surgeons. Well, then, but for steam, the happy inhabitants of merry England could not and would not have those luxuries, comforts, or necessities which they now enjoy. Honour to that departed philosopher, whose sagacity and perception, under Divine Providence, applied the bubbling resistance of our tea-kettles to the most noble and useful purposes of humanity."

MY OPINION OF BRITISH AGRICULTURE.—While the agricultural community is congratulating itself on its rapid progress, and while our talented friend Monsieur de la Trébonnais is holding us up to his countrymen in France as models of agricultural progress, your humble servant is lamenting our agricultural backwardness and imperfection. This discrepancy of sentiment may be readily accounted for. They compare the present with the past. With them the extensive background of non-improvement throws up in pleasant relief the bright spots of progress. With them the exceptions excuse the rule. With me they do but condemn it, and point to its amendment. We may admit that much of our light and self-drained lands is very much improved, and in many districts very highly farmed; but that extensive portion of our island, called cold, stiff, tenacious clay, fifteen-sixteenths of which are still undrained, is to my certain knowledge in a most unsatisfactory and unprofitable condition, as regards the interests of landlord, tenant, and the country at large. Now it is, in my opinion, precisely these soils which, when improved, are the most dependable for a result,

containing as they do, an undeveloped treasure of ammoniacal and phosphatic fertility. Those gifts have not yet been availed of, and it is steam cultivation alone, after drainage, that can place those subterranean treasures at our disposal. My observation of the present cultivation of our stiff clays would give an average depth of about four to five inches—all below this may be considered an unknown and unimproved territory. It is true that after drainage, the filtration or percolation of water and manure will gradually and certainly aerate and improve the subsoil, but the process is too slow for these quick-moving times. You want rapidly to dry these dead and saturated masses by atmospheric exposure. The dense and closely packed mass of infinitesimal granules must be separated by pulverization, so that the millions of almost imperceptible fibres may introduce themselves without difficulty to the hitherto unapproachable but fertilizing ingredients of the subsoil. Liebig, and our other great chemical lights, have proved to us that every breath of air that passes over newly exposed clay abstracts from it its moisture, and in exchange blesses it with ammoniacal and fertilizing gases. As you follow the steam-cultivator on a dry day, instantaneous exhalations strike your nostrils, and convince you that the earth is a great apothecary's shop full of chemical compounds. The rough and lightly laid fallow absorbs the fructifying subsoils, and imparts to the air in contact with it an expansive heat, which causes it to rise in wavy playfulness in its struggle through the superincumbent but colder atmosphere. The rusty-looking iron of our so-called poor clay subsoils, makes greedy claim upon the passing ammonia. A volume might be written by our chemists upon the advantages of evaporation, percolation, dews, frosts, fogs, and sunshine. Jethro Tull was the prince of cultivators, but the want of artificial drainage defeated all his calculations. The Rev. Mr. Smith, of Lois-Weedon, is the great Jethro Tull of the present day. Fifteen years ago I was convinced that on our stiff yellow clays cultivation was more important than manure; acting on that conviction, after I had drained my land, I broke it up with three horses, six other horses following in the same track, with Smith of Deanston's great subsoil plough. Our labourers called it a little earthquake, and my crops have never forgotten it; but for all that I saw how costly was horse-power when deep cultivation was attempted, and how necessary it was that we should apply steam to get a yard deep of cultivation, instead of ten or twelve inches.

AGRICULTURAL DOUBTS ABOUT STEAM.—I confess I was very much astonished that our progressive friend, Mr. R. Smith, in his recent lecture to this Club on "Agricultural Progress," should describe steam-culture as "yet a venture." I consider steam-cultivation an accomplished fact; profitably accomplished, and therefore practically attained. It is impossible to deny with truthfulness that both Mr. Fowler's and Mr. Smith's plans are practically proven and sealed with the stamp of superiority over horse-power, both in cost and effect, by the award and medal of the Royal Agricultural Society of England. From my own observation of

both these plans, I am sure it will pay to use them. Had I not my fixed steam-engine I should at once adopt the practice, although my land has all been already very deeply disturbed, but I suppose I must hire a portable-engine. As

A PROOF OF THE ADVANTAGES OF STEAM-CULTIVATION, let me mention the following fact: At my great gathering in July, 1856, Mr. Fowler's steam-plough, with the subsoiler attached, cultivated two stetches of clover lea, being part of a field on which wheat was to be sown in October. Although that field had been formerly subsoiled, and forked by manual labour, Fowler's subsoil brought up and exposed to view some undisturbed nasty ochrey and rusty subsoil. Some of our agricultural friends would shrug their shoulders and say nothing would grow on it, but mark the result. In October or November the wheat was duly drilled over the whole field; as soon as it came up, and in every stage of its growth, those two stetches showed their superiority. After harvest the field was all manured and dug with the fork, and produced a fine crop of mangel in 1858. It is now (April, 1859), in wheat again, and in this early stage of growth, the two stetches—steam-ploughed in 1856—still show a superiority! My men called my attention to this only on Saturday last. But who can seriously doubt the benefits of deep cultivation on strong clays after drainage? After the recent showers, I could see the deeply-moved soil, over drains, showing light-coloured and dry, whilst the intermediate spaces were dark and damp. It was *deep cultivation* that did this, producing facile aëration, powerful capillarity, and rapid evaporation. It proves that a yard or four feet deep of cultivation is not a bit too deep; and when I remember that at my friend Dixon's, near Witham, a parsnip was pulled up whose roots were thirteen feet six inches long, and then broke off, I seriously believe that we have no present idea as to what depth of cultivation and drainage we shall ultimately arrive at with steam-power. Why did that parsnip go so deep? Because the earth had all been moved to the depth of fourteen feet. It had been a brick-earth pit, filled up with soil from the adjoining land, when it was necessary to open a new pit; air and water had circulated freely to the depth of 14 feet. It is not what an operation costs, but what profit it pays, that must guide us. The shilling flail is superseded by one that costs £300, as a matter of economy and profit. Who is to say that we shall not have scarifiers or grubbers whose tines will gradually go four, five, or six feet deep, drawn by a 100-horsepower engine? Am I visionary in anticipating such a result? Is it more astounding than Fowler's draining-plough—drawing, as it were by magic, its lines of pipes, like ropes of sausages, deep into the bowels of the most obstinate clays? And here I should consider myself ungrateful indeed did I not record my admiration of, and gratitude to, that spirited and far-seeing man, who has devoted his fortune and his mind to the successful realization of what agriculture once considered a romantic and chimerical idea. If my anticipations are to be realized, let our shallow drainers deepen their ideas and spare their pockets.

OUR PRESENT PLANS OF STEAM CULTIVATION. — My public position as an agriculturist brings to me many an anxious and intelligent inventor, whose sleepless mind is worn and absorbed by the great one idea, and who languishes for the wherewithal to develop and give a practical bearing to his thoughts. I often feel, as I listen to the anxious and confidential communication, how much must be done and suffered ere the practical public will avail of and pay for the inventor's genius. We ought to feel grateful to those who I know have devoted their money and time to the improvements in machinery. It is not my intention to make invidious comparisons between the various means for steam culture. Let each one consult the judges' decision, as given in the last number of the Royal Agricultural Society's *Journal*. Let him spend a little time and money in watching the practical operations which are now so extensively going on—to which access is so liberally granted, and which are so accurately described by the various agricultural publications of the day. Years ago I ventured to predict that we should soon have forty different modes of steam cultivation. Such an idea is rapidly approaching realization. We have now—1. Fowler's Draining and Trenching Ploughs. 2. Smith's Scarifiers. 3. Williams's ditto. 4. Boydell's Traction Engine. 5. Bray's ditto. 6. Romaine's Cultivator. 7. Fiskin's Plough. 8. Rickett's Archimedean Cultivator. 9. Halkett's Railway system of Steam Culture; and I know of others which are yet to meet the public eye. I rejoice in the pungent and gladiatorial rivalry on this subject, which fills the columns of our agricultural newspapers. The steam-press is developing steam cultivation—drawing the attention of even the lag-behinds of agriculture, and making them progress in spite of their prejudices. I have no fear but that each claimant for public steam favour will meet his reward according to his merits. Agriculture is a fine open field of comparison, if people will but look at it. I recently saw Mr. Smith's Steam Cultivator (made by Messrs. Howard) at work on a farm of stiff soil in Hertfordshire. Its work appeared to me simple and perfect. It was smashing up or grubbing the land four-and-a-half to five inches deep at the cost of one-shilling an acre for coals, two shilling-and-sixpence an acre for manual labour, and something for the wear and tear of the steam-engine and steel-wire-rope, &c. The rope was much smaller than one's little finger, say nine-sixteenths of an inch diameter. I have often heard heavy-land farmers say that they should like to have horses without feet; this is actually the case with steam, which cultivates without pressure or consolidation.

HALKETT'S GUIDEWAY STEAM CULTIVATOR. — I cannot pass by, in silence, Mr. Halkett's noble efforts to effect the operations of the farm on a grand scale by an entirely novel process. Having witnessed the operation, I was struck with the simplicity and unerring accuracy of the work done, as well as by the application of the whole power of the engine without rope, and with a mere fractional friction. Every one who heard Mr. Halkett's paper read before the Society of Arts, must have retired with a conviction that the subject was

worthy of the most profound consideration, and of a fair national trial on a large scale. Who is to do this and find the means is another question. I have never yet heard any one dispute Mr. Halkett's calculations. When I see that 240 tons' weight can be drawn on a railway, at a speed of twenty miles an hour, a whole mile for two-pennyworth of coal, I see that the whole question hinges on the calculation of what sum would be sufficient interest for wear and tear, and first cost of his proposed railway. I exhibit a photograph of the machine in operation, performing various farm labours. If our unduly costly railways pay the shareholders an interest equal to Consols, and yet take us as cheaply as the old coach, saving three-fourths of our time, is it so utopian to imagine that similar causes should produce equal effects in agriculture? Is not time, in horse and manual labour, as much money as time on the rail? By-the-bye I have just heard that Boydell's traction engine is drawing coals into Manchester, from a colliery, at one-penny per ton per mile, on the high road. It always surprised me that railway buffers and springs were not attached to the machine when it had to draw ploughs or scarifiers. But for these buffers and springs, our railway-engines would be breaking their chains, and doing much mischief by sudden concussion. I hear that as much as £10,000 has been expended on Romaine's cultivator since I lent my aid to its introduction. The inventor is still sanguine of success, judging from its operations in Yorkshire, but a large expenditure is yet required for its full development; it is intended, I believe, to fit it with Boydell's wheels, or something on the same principle. I deeply regret Mr. Boydell's severe indisposition, arising from his anxious and unwearied exertions about his traction engine. I have received the following from Mr. Hall, who has used Fowler's plough for some time. It will be seen that he works at very high pressure:—"Navestock, Essex, April 26, 1859: Dear Sir,—I find in practice that my portable engine, working three hundred and twenty pounds pressure, consumes eight hundred and fifty pounds of coal, worth eight shillings and sixpence, per each day's work of ten hours, while drawing Fowler's four-furrow plough, by the wire-rope system; and six acres is a fair day's work at present, and which requires three men and two boys, and one horse for water. This same engine was worked with Boydell's wheels as a direct traction, drawing Fowler's (same) Plough. To work ten hours, and plough six acres, she required eleven to twelve hundred pounds of coal. She therefore consumed about a quarter of her fuel to propel herself, besides the damage done to the land by her wheels, which was fatal to that principle for cultivation; but to be enabled to proceed into any field, without horses, is a most valuable acquisition. My fixed engine, working at one-hundred-and-twenty pounds pressure, consumes five hundred-weight of coal in twelve hours, driving one pair of barley-stones, grinding eight bushels per hour, and two pairs of wheat stones grinding four bushels per hour each.—I remain, sir, yours very truly, COLLINSON HALL. We worked this engine at two hundred pounds' pressure, and then four hundredweight of coal performed the same quantity of work as the five hundredweight at one hundred

and twenty pounds now does. Since the mill was burnt down, in 1845, I have thought it prudent to reduce the pressure."

THE PIONEERS OF STEAM CULTURE.—Years since I had the privilege of inspecting Lord Willoughby d'Ercsby's steam-ploughing in Lincolnshire, worked by the "California," a portable steam-engine exhibited in the Crystal Palace of 1851, one of the most perfect and powerful portable engines I ever saw. Again, we are much indebted to the Marquis of Tweeddale for the Yester steam-ploughing, which ought to have convinced the agricultural world long ago not to be afraid of exposing a heavy subsoil to atmospheric influences. Then, Mr. Usher, of Edinburgh, has strong claims on our thanks and sympathy, when we consider the large sums he expended on producing his steam cultivator. Experimenting is no joke. I believe that to perfectionate these implements has cost the inventors a fortune of many thousands.

COMPARATIVE VALUE OF HOUSE AND STEAM-POWER.—We are much indebted to Mr. John C. Morton for his able paper on the cost of horse-power, in the Royal Agricultural Society's last *Journal*; but, if I had any doubt before, that paper has convinced me that horse-power is at least from 50 to 100 per cent. dearer than steam, where the latter can be brought to bear. If manufacturers were asked even to make the comparison, they would ridicule the idea, and tell you that but for steam you could be neither clothed, housed, nor fed. What a manufacturer wants and uses, is "power," cheap, untiring power; and is this not exactly what the agricultural cultivator requires? Now, you can never get combined or continued power with horses in any number. When first the mole plough was tried on a stiff clay in Essex, before the introduction of the capstan, upwards of 30 horses were attached to it, and a very Babel of confusion ensued. In their struggling attempts at uniform draught, the outsiders compressed those in the centre until a cloud of steam arose from the excited and oppressed animals. Compare this with the tranquil grandeur of a twenty, fifty, or five-hundred horse-power engine. In comparing horses with steam, we could only allow a horse to work full collar, *without intermission or rest*, for four-and-half hours: that would be an ample day's work, and it would cost 2s., because a large well-fed draught-horse cannot be kept for less than £30 per annum. Let us see what my own steam horse costs working ten clear hours per day, full collar, and my engine is not of the latest improvement, having been in use ten years. The exact measure of one strong horse-power in steam is the evaporation of six gallons, or sixty pounds of water, per hour. My own engine evaporates fifty-four gallons per hour, and therefore, gives nine horse-power, working ten hours per day, which is equal to eighteen real horses working five hours per day.

I burn half-a-ton of dust coal, at 9s.	£0	4	6
Cartage.....	0	1	6
	£0	6	0
Horse-power would cost	£1	7	0
One labourer at 2s. per day manages my engine, feeds			

it, and cleans it. How much more would it cost to attend on eighteen horses? I could enlarge upon this comparison *in extenso*, but in these days it is only in agriculture that such a question would be entertained, and I must say I feel humiliated that my friend Mortou in his recent excellent paper has taken so favourable a view of the endurance and availability of horse-power as compared with steam. In the great Cornish pumping-engines, which are considered as the most economic in combustion, coal being dearer there, three pounds of coal per hour will produce one horse-power; so that assuming that four hours' *incessant* work would exhaust a horse for twenty-four hours, twelve pounds of coal, costing five farthings (or twenty shillings per ton), would do as much work as a horse which costs 2s. This is no exaggeration. Even the common portable agricultural engines—which are far less economical in fuel than the fixed condensing engines—will, when in perfect order, produce a day's work equal to one horse-power for twenty-four pounds of coal, or twopence half-penny. The trials of these engines by the Royal Agricultural Society, as reported by the judges, show a consumption of about five pounds of coal per horse-power per hour. A very respectable miller assured me that he once, for a wager, ground two hundred quarters of corn with fourteen shillings and sixpence worth of coal, which would be under two-pence per quarter, or about one farthing per bushel, and I know that with the common Cornish boiler, and noncondensing high-pressure engines, the ordinary fuel for grinding is only one penny per bushel. How the increased population of this country could be fed, had we to depend on wind, water, or horses, is beyond my comprehension. We see, in fact, that almost everywhere a steam-engine is attached to the wind or water-mill, and, in addition, we have great steam-mills at many of the railway stations. Considering that a vast number of steam-engines are worked night and day, it may be fairly estimated that one horse-power worked twenty-four hours is equal to the labour of six real horses for the same period. Take an Atlantic steamer, that steams unceasingly night and day, and suppose her power to be one thousand steam horse, you would require six thousand real horses to do the work!! To imagine what space so many animals would require, their food, water, attendants, bedding, harness, and shoeing, seems an impossible absurdity, and yet, practically, when a farmer uses a horse where he might use steam, he is in an equally ludicrous and unprofitable embarrassment. This brings me to the conclusion—

ON HOW SMALL A FARM WILL A STEAM-ENGINE PAY, AND WHAT HAS A STEAM-ENGINE TO DO ON A FARM?—When I speak of the general application of steam-power in agriculture, I assume an improved and profitable condition of agriculture, very different from that which unfortunately generally exists; but let me take a well-regulated and a well-drained farm of two hundred acres or less, making five score of meat per acre (I make more than ten score, the labourer makes thirty-two score), there will be plenty to do to grind corn, crush oats, break rape-cake, cut and steam chaff,

thrash and dress corn, pump water, and, if opportunity offers, work irrigation pumps; and if you add to this the cultivation of the soil, an eight-horse-power engine will not have many holidays. It is a great convenience to your neighbours to send in their corn to you, to be ground. I find that in this way the money I receive in grinding for others pays for all my coals, so that my engine only costs the wear-and-tear and attendance, and still does all my work, irrigation included. Since harvest I have ground more than three hundred quarters of corn for my pigs. When your engine rests it eats nothing. I find that by treading down the chaff, cake, &c., when steamed, and thus preventing the access of air, it will keep sweet and hot for a week or more, according to the bulk of the mass, and the animals like it better. On a farm of two hundred acres there ought to be at least two hundred tons of straw, to cut into chaff, and to be steamed by the waste steam from the engine. The time will come when we shall warm our bullock-sheds with steam in cold weather, as the manufacturers warm their mills, and in summer it would pay well to drive a circulation of air by a fanner through the cattle-houses, and not a fly will be seen there, nor any disease. There is no doubt that during summer much beef could be and should be made by bullocks comfortably warm, untormented by flies or excess of sunshine; but then all this implies a manufacturing adaptation of means to an end, which will involve a system of intelligent reconstruction in our farmeries. All this will come when our doubled or tripled population will demand twice or three times the amount of meat now produced on our little island.

STEAM ON SMALL FARMS.—There is no reason why small farmers should be deprived of the benefits of steam cultivation; already some spirited individuals in our district, who are owners of nearly a score of steam-engines, execute the thrashing and Fowler's plough-draining over an extensive district, at a fixed price per acre, and I know that they are about to carry out steam cultivation on the same terms.

GAIN IN TIME AND OPPORTUNITY BY STEAM-CULTURE.—Although, irrespective of the above consideration, steam is much cheaper than horse-power, the question of cost becomes insignificant in comparison with opportunity. Nothing can illustrate this better than the words of Mr. Smith, of Woolston, in one of his recent letters on the use of his steam-cultivator. He says: "I have shown that two hundred and twenty-five acres of heavy clay require the work of an eight-horse power engine forty-five days. I find from practice it would require thirty-five horses to perform this work in the same time, *i. e.*, five horses for three hundred and fifteen days, the whole of a year; this, of course, does not include what can be done by the apparatus in the spring and summer." In other words, as a farmer of two hundred and twenty-five acres would only have eight or nine horses, three-fourths of his stubble-land would be unbroken during the forty-five fine days of August, September, and October. It is only the chemist of agriculture who can sufficiently appreciate the enormity of this loss of aëration, evaporation, filtra-

tion, and consequent fructification. If the consolidation of stiff clays in damp weather by pressure renders them infertile by the exclusion of air, which I practically know to be the fact, the opposite of this, by steam cultivation in dry weather, must be a great gain. Mr. Smith's comparison of horse and steam power confirms my own calculation, that four hours of *unremitting* draught, without a rest, is an ample day's work for a horse. In the midland counties, where the barbarous practice of four horses in a line and two drivers still exists, the ceremony of turning at the headlands, the alternate coaxing and threatening to get the horses into working condition, consumes no end of time. Even in our own well-ploughed pair-horse county, I have, on a fine May tranquil morning, been highly amused by the colloquy, if I may so term it, between a pair of knowing fat horses and a good-natured but indignant ploughman, as the ejaculations of "Boxer and Violet," "worrae," and "Hike, come hither," came ringing on the morning air, the horses taking especial care to reserve their effort to pull for the ploughman's last burst of indignant excitement, sometimes accompanied by a small clod: stern, untiring steam will destroy much of the poetry of agriculture, and give it a Manchester character.

THE GREAT ECONOMY OF STEAM-POWER is proved by the Judges' report of comparative trials at the Chester Show: Hay cut into chaff in 3 minutes, 128lbs.; roots cut for sheep, 314 lbs.; ditto for bullocks, 620 lbs.; ditto for ditto, 1,278 lbs.; roots pulped, 490 lbs.; thick oilcake, broken, 165 lbs.; corn winnowed, 761 lbs.; corn dressed, 400 lbs.; wheat thrashed and dressed in 13 minutes, 200 sheaves; harley thrashed and dressed in 5 minutes, 100 sheaves. I know that such results as these could not be obtained by ordinary farm-labourers, because in these trials the machines and men are well "up to the mark," every energy strained to the utmost, and the engines in first-rate order; but even making an allowance for these circumstances, steam is, indeed, a wonderful economy. Every farmer ought to study the Judges' reports in the Royal Agricultural Society's Journals. The trials of steam cultivation are as follows: Fowler ploughed six inches by nine (equal to three-horse work), one acre per hour at a cost of 9s. 2d. per acre; and trench-ploughed an acre twelve inches deep and fourteen inches wide, at 18s. 4d. per acre. The gain over horse-power in the latter case was enormous, as I know practically. Messrs. Howard of Bedford's Smith's steam-cultivator for the two operations of cultivating and cross-cultivating, or swathing up to the depth of from six to seven inches, gave a charge of 14s. per acre, which was considerably cheaper than horse-power. I have reason to believe that both these implements have since been working even more effectively and economically on ordinary heavy-land farms. On our railways 240 tons can be carried one mile for two-pennyworth of coal, and three minutes' time of the stoker, guard, and engine-driver. Compare this with horses on the common road at 7d. per ton per mile! which would amount to £7.

DRAINAGE AND IRRIGATION EFFECTED BY STEAM.

—The great fen district of the Bedford Level, once a swamp of 200,000 acres, owes its value and fertility to a steam-power of 1,200 horse, which, distributed at intervals towards the coast, works enormous pumps or wheels, which, creating an artificial fall, by raising the water, cause an outfall for the drainage. Some of these engines throw up 120 tons per minute. Again, the great Whittlesea Mere, a sort of inland sea, is now a garden of cultivation, having been pumped dry by Appold's steam pumps, such as we saw at the Exhibition of 1851. These lands, like the great Bedford Level, are preserved from inundation by steam-power always acting or ready to act.—"Elton, Oundle, 19th April, 1859: Sir,—I beg to acknowledge the receipt of your letter of the 15th. The Appold Pump, at Whittlesea Mere, drains upwards of five thousand acres of low land, exclusive of the water-shed from the high lands, which will include four or five hundred acres. The engine, pump, and buildings, including extensive piling for foundations, cost £2,500. (The drains and ditches are not included in this sum.) The cost of the first three years' working and repairs—1851 to 1854—averaged one shilling per acre. In 1852 the newly-formed banks broke, and one thousand acres of land were inundated. This had to be pumped out, and the average of the cost was raised by this circumstance: 1855, 6d. per acre; 1856, 8d. ditto; 1857, 10d. ditto; 1858, 8d. ditto. This includes coals, repairs of engine, engine-man's wages, oil, &c., &c. The quantity of water raised six feet is 16,000 gallons per minute. The lowest lift is four feet six inches, the highest ten feet. The engine works now about three days a-week, and runs four or five hours *per diem*—not consecutively, but at intervals, the supply of water not being sufficiently rapid for the discharge by the centrifugal pump. There is no publication containing these facts; you are welcome to them.—I am, sir, your obedient servant, JOHN LAURANCE." This is an instructive communication. If we add to the 1s. per acre 5s. or 6s. for annual interest of the drainage, we have the average value of one bushel of wheat, as the charge of converting a lake into a fertile field!! Messrs. Eaton and Amos are now making Appold's pumps for the West Indies, capable of throwing or raising 30,000 gallons of water per minute! I mention this to show that you must bring your minds to the consideration of artificial drainage combined with irrigation for even your stiff clays. The drainage of the country, by wells for steam-engines, by large water supply for your towns, by railway tunnels and cuttings, by the removal of trees and fences, and, above all, by the evaporation of a great and deep arable culture, are causing you a diminished rain-fall, which may, in time, render irrigation by steam a necessity for your grass lands and root crops. I know of much sea-walled land now in a state of nature, that might be profitably improved by steam drainage and irrigation. It must not be forgotten that much of the manure placed in our land finds its way in solution to our rivers and brooks, and that what we look upon as pure water contains the most valuable elements of our manures. Hence the value of mere water for irrigation; and I am astonished

that Professor Voelcker, in his Paper on Sewage Irrigation, in the last number of the "Royal Agricultural Society's Journal," attaches no value to 50,000 gallons of water per acre, or a rain-fall of more than two inches. As a farmer said to me the other day, "If you can't get water, you can't get grass"; and he was quite right.

SAVING OF FOOD BY STEAM CULTURE.—A diminution of one-third or more of our horse-power would set free for the food of man a vast extent of our soil. If the horses of agriculture consume the produce of one-fifth of its available area, it follows that something like 2,500,000 acres would be gained for food for the population. Spackman estimates the farm-horses at 1,500,000—in my opinion far too large an estimate, seeing, on arable farms, that we have only one horse to twenty-five acres. Every hundred acres of arable land require four horses, and each horse consumes the produce of five acres, or the food of seven men. I consider that steam for cultivation, grinding, and thrashing, chaff-cutting, pumping, &c., would economise two-fifths of the horse-power of the farm.

WARMTH OF SOIL GAINED BY DEEP STEAM CULTIVATION.—We all know that heat and moisture are the two elements of decomposition and of rapid growth, as shown in tropical countries. Deep and loose cultivation tends to this result—possibly the action of light may also be important. One cause of the rapid growth of market-garden vegetation is depth of cultivation, combined with the subterranean heat of decomposing town manure; and wherever there is heat, moisture is attracted. The necessity for a more perfect cultivation is obvious; even on a fallow you may pick up small hard knobs or clods, which, on breaking into fragments, exhibit a little treasure of unexplored and unavailed-of territory, confirming the great Jethro Tull's principle of infinitesimality in cultivation. I have great faith in Crosskill's clod-crusher, in very dry weather, for unlocking obstinate clods. Might not that heavy tool be drawn by steam? It would only require guide-wheels, &c.

TOWN SEWAGE APPLIED BY STEAM.—I have so often enlarged upon the vital importance to this country of sewage-irrigation from our towns, that I will only say to my brother-farmers—Consider the value of a daily folding on the land of twenty-eight millions of well-fed human beings (or sheep), and add to this all the animal deposits in our towns, and various other waste products, and you may then fairly estimate how much you lose by permitting these treasures to flow away to the sea. Let it be "willed" by agriculture, and the engineering difficulties will vanish. Thirteen-fourteenths of the excrement of human beings and animals are the urine; so that it is in a condition to flow away, even without the addition of water. Watford, Rugby, and other towns will bear witness to the facility with which this operation may be effected; but it must be done by steam power, and that is why I mention it in this paper. The question will very soon force itself to a solution; for in spite of filtration, the fluid from our Board of Health works poisons our rivers in summer. That solution must inevitably be a filtration through an

agricultural soil, from which the nastiness of our towns and cities will re-appear in the more acceptable form of food for their inhabitants. The great privy question must be talked about and dealt with, in spite of our delicate sensibility. The question of the application of the sewage of our towns to agricultural fertilization is one that is gradually forcing itself upon public attention, and is dependent on the use of steam. The very fact of a large water supply to our towns will compel its application to the soil, or your rivers will become sewers. There are no cesspools now from which it may be taken in carts to the land. The Board of Health at Croydon are in a complete fix in Chancery on this question. The anglers on the pellucid river Wandle will not receive it, and the landowners are bringing their action because they will not have their land fertilized by it, however agreeable and profitable it may be to the tenants; where, then, is it to go? When I stood over the tanks at Croydon, into which flowed the nastiness of 23,000 people, and reflected on that estuary which is to pour into the Thames at one point the abominations of 2,800,000 living beings, besides that of tens of thousands of animals, I almost trembled for the result. Take this Croydon affair as an example of the facility and cheapness with which irrigation may be effected by steam power. A single engine, consuming fifteen shillings-worth of coals every twenty-four hours, raises one million gallons of water, and then forces it through a 12-inch pipe to a tank a mile distant, and 150 feet above the engine. Now it is quite clear that about the same power and the same size pipe would re-distribute subterraneously to certain hydrants on the fields the said quantity of water when enriched with all the good things of Croydon.

AGRICULTURE COMPARED WITH MANUFACTURES.—Spackman, in his "Occupations of the People," estimates the agricultural interest in land and tenants' capital for the United Kingdom as £2,000,000,000, or twenty-five times as large as the manufacturing interest, which he estimates at £78,000,000. Although I think this is exaggerated, there can be no doubt that agriculture is by far the largest interest in the kingdom. But is it the most intelligent and unprejudiced? I think not. If I were to test this comparatively, I should estimate it by the amount of steam power which it employs relatively to the other great producing interests of the country. Let us see how the matter stands. So far as I am able to obtain approximate estimates—

	Horse-power.
Manufactures employ 150,000 steam-engines of an average power of 20 horses.....	3,000,000
Railway locomotives, 7,550, 100-horse power	755,000
Marine engines, 2,000, of 100-horse power	200,000
Our armed steam navy, 450 ships.....	100,000
Agriculture, only 6,000, 8-horse power....	48,000

Now, if Mr. Spackman is right, agriculture should employ millions of horse-power, instead of only 48,000.

In these days, I take the use of steam to be the measure of progression, intelligence, and profit. What is there in agriculture so complicated or difficult that steam could not master? I saw in Manchester, the

other day, two 18-horse power engines, which cost a thousand pounds, employed entirely in packing bales, and working the hoists or lifts which carried the men and cotton goods from floor to floor. The hydraulic squeeze given by steam-power caused a bale to be packed in three minutes, which, by manual labour, used to require fifteen minutes. Time, surely, is money as much in agriculture as in any other industrial occupation. Taking the average of farms at the ordinary depth of cultivation, the number of steam-engines required would be enormous for cultivation alone; but if our clays are (as they ought to be) moved to a depth of two or three feet, then, indeed, great will be the requirement of steam power. As our ordinary depth of cultivation is under five inches, and as our little island is sea-girt, tripling or quadrupling our depth of cultivation would be equal to an immense extension of territory, without additional rent, tithes, or taxes. At present, in our stiff undrained clays, all below five inches is a *terra incognita*, unseen and unavailed of, as is shown by the "going off" of the crops in April and May.

STEAM ESTIMATES.—In estimating the probable amount of steam-power used generally in our various industrial manufacturing and commercial operations, I have to tender my thanks to my official and other friends for the kindness with which they have placed statistical facts at my disposal, and for the information which they have otherwise afforded to me. I have been assured that in a circle of twenty miles in and around Manchester there are 50,000 steam-engines; if so, agriculture owes a deep debt of gratitude to Manchester, which I hope she will repay by similar means. I find that every fifty miles of passenger-railway employs forty locomotives. The number of miles travelled on our railways in 1857 was over seventy-four millions; the average consumption of coke, 34lbs. per mile. A very great economy has lately been effected by the use of coal: the furnace-door is left open, and the air rushing in, strikes against a deflecting-plate, which throws it on the surface of the fire, and causes perfect combustion without smoke. This is a hint which might be availed of in our agricultural portable engines. The air has much the effect of being blown on the coals by a bellows. Flame gives much more heat than red-hot coke.

CONCLUSION.—Apologising for the length of these remarks, I hope you will think with me that I have proved that steam is not only an advantage but a necessity for agriculture, and that it has not been sufficiently availed of. A great responsibility attaches in this matter to those in high places who have large estates. We know, especially where there is only annual tenure, that a landlord is much looked up to by his tenantry, and that there is somewhat of a patriarchal character in their relations. So long as that exists, a heavy responsibility rests with the lord of the soil; his example and encouragement are required, and almost demanded, in this matter of steam. It may be necessary for men to exercise a gentle despotism in the removal of prejudices, which are often very strong in agriculture. How all this may be done is easily explained by a reference to the late great Mr. Coke, of Norfolk, who converted a

poor tenantry and a miserable estate into the opposites of farming wealth and greatly increased rentals. We have modern examples of this, such as Lord Lonsdale, the Duke of Bedford, and many others, who combine investment, improvement, and encouragement with honour, profit, and progression to themselves, to their tenantry, and to their country. There is plenty of room for such examples to be followed in our at present half-farmed country. The mere value of steam to agriculture in the sawing and preparing of the timber of an estate is considerable; and I remember to have been delighted, thirteen years ago, with the workshops and machinery of the Duke of Bedford, at Woburn, whose farmeries, cottages, and hedge-rows are a standing censure on the general agricultural non-improvement of this kingdom. In conclusion, agriculture has been, in the matter of steam, backward, mis-calculating, and ungrateful. The statistical comparisons which I have made are humiliating for British agriculture; and when I say agriculture, I mean landlord as well as tenant, for property has its duties as well as its rights. When I see that landlord, tenant, and labourer are indebted to steam manufacture for cheapness and abundance in almost every necessary they possess, both mental and physical, I do consider that common gratitude should induce them to adopt similar means to feed abundantly and cheaply the enlightened manufacturing population to whom they are indebted for those benefits. My agricultural friends may think me somewhat severe in these my observations; but they are our best friends who tell us of our faults; and I only enforce what I practise, and practise profitably, too. I shall, therefore, hope to receive their forgiveness for this my contribution to their agricultural literature. Pleased, indeed, should I be to see agriculture so perfect, that "Othello's occupation would be gone."

PRACTICAL OBSERVATIONS ABOUT STEAM ENGINES.

I have annexed a few of my practical observations and convictions about steam-engines, for the information of those who will take the trouble to read them. They are as follows:

FIXED OR PORTABLE ENGINES.—There can be no doubt that fixed engines are more economical and durable than portable engines. I have had one in use ten years, and it is nearly as good as the first day I had it. There is much less wear and tear in a fixed engine than in a portable one. Bringing home the corn in the sheaf, at harvest-time, in Hannam's carts, is quite as economical as stacking and threshing in the field, and afterwards bringing home the loose straw, chaff, &c. But, if we cultivate by steam, we *must* have portable engines; and then, when used for stiff work at the home-stead, they should be fixed in a strong frame or support to prevent oscillation. Every thing connected with steam-power should be firm, steady, and free from trembling movement. So important is this considered in our manufacturing districts, that their buildings are most substantial. For Mr. Salt's 500-horse power engine at Bradford, 1,200 tons of stone, bolted and fixed as one mass, were required as a foundation to hold the

monster firmly. Our old agricultural buildings would be racked to pieces by steam-power. It would do farmers good to see the unerring movement of our manufacturing machinery, all smooth and steady. A well-finished engine is almost as finished as the works of a watch, and as far as possible should be kept free from dust, grit, or rust. This is the case in our manufacturing districts, where the engine has a room to itself, as clean as a drawing-room. Farmers who use steam ought to know something about it, and I would recommend their adopting Messrs. Ransome's instructions, ably given in the last number of the "Royal Agricultural Society's Journal," which every farmer of 150 acres would find a profit in subscribing to. Mr. Williams's plan of avoiding smoke is worthy of inspection, and may be seen at Messrs. Redpath and Co.'s foundry, near the Stepney station. A five-pound note will save much waste and nuisance, and give increased power. Mr. Fairbairn's test of safe boiler-pressures is as follows: he says—"The following table, deduced from my own experiments, exhibits the safe working-pressure and the bursting-pressure of boilers of different diameters, calculated for an external shell of a thickness of $\frac{3}{8}$ ths of an inch :

Diameter of Boiler.		Working Pressure.	Bursting Pressure.
Feet.	In.	Lbs.	Lbs.
3	0	118	708 $\frac{1}{2}$
3	6	101	607
4	0	88 $\frac{3}{4}$	531
4	6	78 $\frac{3}{4}$	472
5	0	70 $\frac{3}{4}$	425
5	6	64 $\frac{3}{4}$	386 $\frac{1}{2}$
6	0	59	354
6	6	54 $\frac{1}{2}$	326 $\frac{3}{4}$
7	0	50 $\frac{1}{2}$	303 $\frac{1}{2}$
7	6	47	283 $\frac{1}{2}$
8	0	44	265 $\frac{3}{4}$
8	6	41 $\frac{1}{2}$	250

Taking from the above table the strength of a boiler 7 feet in diameter, we find its bursting-pressure to be 303 $\frac{1}{2}$ lbs. per square inch." There are certain practical matters in relation to fixed engines which are worth knowing. I therefore consulted the following books with much advantage: "Armstrong on Boilers," "Williams on Combustion;" I have also "Dr. Alban on High-pressure Steam," and "Craddock's Lectures on the Steam-engine." This information and my own observation have induced me to come to the following practical conclusions upon certain points connected with fixed steam-engines not multitubular :

FURNACE.—That there should be one square foot of fire-grate for every horse-power. That the fire-bars should be at least two feet below the boiler-bottom. That the space above the bridge should be equal in area to thirty square inches for every foot of fire-grate. That the flues in every part, and the opening into the chimney, should have an area of thirty square inches for every foot of fire-grate. That the furnace-plate and fire-door should be pierced with thirty half-inch holes for every foot of fire-grate, a deflecting-plate being placed in the furnace. That the boiler should have at least nine feet of heating surface to ever foot of

fire-grate. That there should be very little stoking, and no smoking. That it would repay well to read Wye Williams on Combustion, Dr. Alban on High-pressure, and Armstrong on Boilers, all published by Weale, High Holborn; also Craddock's Chemistry of the Steam-engine, by Simpkin and Marshall. That locomotive or multitubular boilers generate steam quickly, but are difficult to clean, and soon wear out. That Cornish boilers are less safe for high-pressure than flue-boilers, unless very carefully supplied with water; but if kept filled with water, and the steam taken from another boiler or vessel attached to and above them, as in Mr. Collinson Hall's plan, then I consider the Cornish boiler perfectly safe and most economical. That flue-boilers, having a length of three times their diameter, are simple, durable, and safe. That we should have Sylvester's trap-doors at each end of the centre and every other flue, so as to cleanse them when required. That rushing air, like rushing water, will travel quickest through a smooth clean flue free from sharp angles or rough obstructions. Mr. Fairbairn has recently discovered that, in long thirty feet flue-boilers, the flue is of only one-third the strength of the outside shell, although of the same substance. His remedy is simple and effective. This deficiency of flue strength does not exist in boilers under ten feet in length. He says—"If we take a boiler of the ordinary construction, thirty feet long, and seven feet in diameter, with one or more flues, three feet or three feet six inches in diameter, we find that the cylindrical external shell is from three to four times stronger in its powers of resistance to the force tending to burst it, than the flues are to resist the same force tending to collapse them. This being the case in boilers of ordinary construction, it is not surprising that so many fatal accidents should have occurred from the collapse of the internal flues, followed immediately by the explosion and rupture of the outer shell. To remedy such evils, and to place the security of vessels so important to the community upon a more certain basis, it is essential that every part should be of uniform strength to resist the forces brought to bear upon it. The equalization of the powers of resistance is the more important, as the increased strength of the outer shell is absolutely of no value, so long as the internal flues remain, as at present, liable to be destroyed by collapse, at a pressure of only one-third of that required to burst the envelope which surrounds them." That feed-pumps should have a vertical action, with a wide piston and short slow stroke, experience having taught me the inconvenience of a long thin piston and rapid horizontal motion. Perreaux's vulcanized India-rubber valves are infallible. That it is desirable to have a supply of water well-heated by the waste steam passing around it before pumping it into the boiler. That all bearings for rapidly-revolving shafts should be very wide, so as to diminish friction by pressure, and admit of lubrication. That great care should be taken not to bind the shafting by over-screwing the brasses. That all riggers should be turned perfectly smooth, so as to make the driving straps bind on them, by excluding air. That all bearings should be well supported and free from the least

vibration, and that shaftings should never be long enough or thin enough to whip when at work. It is this which causes driving straps to come off. That the foundation of your engine should be solid and sufficient. I think I read that Mr. Salt's great engine, at Saltaire, Bradford, required 1,200 tons of stone for its foundation. That our manufacturers in Manchester, Leeds, &c., evince their appreciation of the necessity for extreme accuracy in their machinery, by the ponderosity of their buildings. That our tumble-down farmeries are often unfit for the vigorous attachments of mighty steam. That great mistakes are made by bricklayers, engineers, and others, in the erection of engines, flues, and setting boilers. (See Armstrong on Boilers and Williams on Combustion.) That it is very desirable one should know something practically about the matter in which we are so much interested—practically, so as to detect or prevent erroneous operations. That your boiler should always be of two or more horse-power than your engine, and that both should be well master of their work. That the absence of glass water-gauges and the mere use of steam-cocks, too common in many of our manufactories, is a dangerous and costly neglect, often resulting in accident, or in the burning of the boiler plates, and interruption of the works. That all high-pressure engines should have a Bourdon steam-gauge, and also a mercurial steam-gauge. I am a believer in Craddock's theory of explosions, and also in Dr. Allban's proposition, that there is much less ebullition with high-pressure than with low-pressure steam, the steam bubbles being infinitely smaller by greater compression. That we owe a debt of gratitude to Mr. Wye Williams, who has taught us to prevent smoke and economize fuel, and who has also enlightened us on the circulation of water in steam-boilers. That the steam-chamber, or steam portion of the boiler, should be enveloped in a heat greater than its own temperature, but not sufficient to make the boiler-plates of too high a temperature. That excessive heat in the ash-pit, red-hot fire-doors and furnace-plates, and over-heated fire-bars, indicate either the absence of a sufficient supply of air to the upper portion of the fuel, or inadequate draught or flue room. That multitubular boilers have their joints loosened by too intense heat passing inside the tubes. That such boilers, when attached to, and above, a Cornish boiler (as in Mr. Hall's case), do not suffer injury, but utilize the heat which passes through them. The advantages of high pressure, great expansion, and rapid movement of the slide, are fully availed of in the locomotive; there the pressure is often 140 lbs. per inch, the steam cut off at 1-24th of the stroke, and the stroke or slide movements very quick. The effect of all this is admirably explained by Dr. Allban. The rapid and almost continued exit of the steam causes a vacuum in the exhaust-pipe, and thus relieves the piston of a large portion of the pressure of the atmosphere, whilst the gain from expansion at 140 lbs. pressure per inch is very large, as shown in Craddock's tables. It must be borne in mind that compression of steam costs us nothing more than the expense of a somewhat stouter boiler. It costs no more fuel to produce steam at high pressure than in an ordi-

nary open copper (*vide* Armstrong). When travelling on the Great Northern by express, the engine-driver told me he worked his engine at 140 lbs. pressure per inch. The most economical management I know of with high-pressure steam, not condensed, is that practised by Mr. Collinson Hall, of Prince's Gate, Romford. He works three pairs of mill-stones at a cost of five shillings per day for coals. This may be considered equal to eighteen-horse power, or thirty-six horses per diem. His pressure is 120 lbs. per inch, worked expansively. The peculiarity is having a multitubular boiler fixed above, and attached to, a Cornish boiler, the heat passing through and then around both boilers, including also the steam space. I very much admire the economy and safety of the arrangement, the Cornish boiler being always full of water. In fact, Mr. Hall's success is partly owing to his superheating the steam in his upper boiler. No doubt you are aware that this principle is being acted upon extensively by the Peninsular and Oriental Steam Navigation Company, who hope to save some 30 per cent. on the £700,000 which they pay annually for coals; the subject is well worthy the attention of agriculturists. Some years ago the American government caused a commissioner to report on the suggestions of Mr. Frost, an Englishman, on super-heated steam, and confirmed his views of its economy. We all know that a very slight degree of cold diminishes the expansion and pressure of steam, and it is easy to comprehend that the opposite of this increases its power; practically I have acted on this principle for some time, by allowing my last flue to encircle the steam space of my boiler: a heat of 650 degrees has no injurious effect in this respect. No doubt it was this consideration that caused Mr. Hornsby to place his cylinder in his boiler; and I think Messrs. Tuxford place theirs in the smoke-box. A fearful loss of power is often occasioned by exposing a long supply steam-pipe to atmospheric influence. Cornish boilers are dangerous for high-pressure, if the upper surface of the internal flue is uncovered or only slightly covered by water. The danger is at starting, when the water rises over the red-hot portion of the flue; it is like plunging a red-hot mass of iron into water. Many a new good *Cornish* boiler has been ruined by the stoker raking out a red-hot fire, and thus suddenly exposing the boiler to a full blast of cold air from the open door. The sudden and unequal contraction starts the rivets, and makes the boiler leak. I have been told that the admission of cold air through the furnace-doors, on Williams's plan, is apt to affect *Cornish* boilers. Probably a deflecting plate would prevent this. All sudden and violent changes of temperature are injurious to boilers.

Mr. J. A. WILLIAMS (Baydon, Hungerford) wished to offer a few remarks on this subject, it being one in which he had taken peculiar interest. It was seven years ago since he first commenced applying his mind to the question of steam-cultivation, and he was now convinced that nothing scarcely had a more direct bearing on the improvement of agriculture. Four years ago he introduced before the members of that club the question of

the general application of steam-power to agricultural purposes, and though he was considered at the time to be taking a rather aerial flight, his predictions had since been fulfilled. He thought he could not better illustrate the subject before them than quoting a small portion from the paper he had the pleasure of reading before them four years ago that very night, on the same subject, and with the permission of the Chairman he would do so:—

“ Lastly, I shall place before you a statistical account of the immense benefit the nation at large would derive from the practical accomplishment of this herculean task. Several years ago Mr. Couling, in his survey, estimated the number of cultivated acres in Great Britain at 46,522,970, and the number of uncultivated acres at 15,000,000. Now, we all know that an immense number of acres has been broken up since—probably a million; but I will content myself with adding to Mr. Couling’s estimate of cultivated acres less than half a million, viz., 477,030, which will make 47,000,000, assuming that that number is under cultivation at the present time. I must here add, that Mr. Couling is a high authority in this matter, having been quoted by Sir Archibald Alison in his ‘History of Europe’—by Mr. Porter, and others. The next conclusion that I wish to arrive at is the number of horses necessary to cultivate 100 acres. For my own part, I have ever been of opinion that it would require four. I have asked scores of practical men, and they all agree with me as to the number required. But we have now something more than mere opinions—we have the statistical returns made by 1,100 tenant-farmers of Scotland, and by a large majority of the farmers of the counties of Norfolk and Hampshire; and although these returns cannot be considered perfect, yet for this purpose they are sufficient, seeing that as far as the returns extend, the number of horses mentioned represent the exact number kept to cultivate the number of acres returned. The Highland Society of Scotland have made a return from 1,100 tenant-farmers of the number of acres they occupy, and the number of horses they keep. The return gives, to 3,431,485 acres of cultivated land, 156,595 horses employed. This is 2,182 over $4\frac{1}{2}$ for every 100 acres; and as the Scotch acre is larger than our own, the result is not far from what I have stated. The county of Hants has returned 603,219 cultivated acres, and 24,076 horses kept thereon, being 52 less than 4 to every 100 acres—also corroborating my opinion. The county of Norfolk returns 621,833 cultivated acres, and 30,334 horses to work them, being 5,462 over and above the number before alluded to. There can be no doubt, then, that if I fix the horse-power necessary to cultivate the land of Great Britain at 4 to every 100 acres, I cannot be far wrong; and, taking the number of cultivated acres before stated at 47,000,000, and multiplying them by 4 to every 100, I arrive at the enormous quantity of 1,880,000 horses kept for the purpose of tilling the soil! If I multiply the number by 30, the probable average value of each horse, it will give the astounding sum of £56,400,000! Now, as to the annual cost to maintain this number of horses. They cannot, in my opinion, taking the prices of the past year, be kept for a less sum than £30 each,

to which must be added £5 per horse for casualties (depreciation), wear and tear, shoeing, and harness. There are various opinions as to the cost of maintaining a horse for a twelvemonth, but in ninety-nine cases out of a hundred it is all assumed. By not reckoning strictly everything horses consume, people are led to suppose that they can be kept for a less sum than I have named; but where a regular account is kept the case is different. Reckoning, therefore, the maintenance of each horse at £30, the annual amount is the same as the cost price before mentioned, viz., £56,400,000! It now remains to consider what portion of this horse-power could be dispensed with, provided steam could be applied as a substitute? If the bulk of the soil could be tilled by steam, I am inclined to think half the horses might be spared by stacking the corn in harvest where it grew, as I mentioned at the commencement of my remarks; but, as I wish to keep within bounds, I will only take a third, which would amount to the number of 626,666 and a fraction, and then the annual cost of maintaining them would be £18,800,000, which would be saved, not only to the farmer, but to the kingdom at large, inasmuch as the food previously consumed might and would be turned to a better account. I have been often asked, ‘If you do away with your horses, what will you do for manure?’ The question might as well be put, ‘What will you do with the food the horses would consume?’ As this is the last and most interesting part of this question, let me state, though I shall probably astonish some of my hearers in doing so, the amount of animal food which could be produced with the farm produce thus saved. It will be seen, from the above calculation, that by dispensing with one-third of the horse-power necessary to cultivate the soil, a saving in corn and fodder would be effected to the amount of £18,800,000. Now, if I take the price of beef and mutton at 7d. per lb., or 4s. 8d. per stone of 8 lbs., the food so rescued from consumption by the horses would produce, assuming that they would not be fed at a loss, 80,571,500 stones of meat; or 805,715 oxen, of 100 stones each; or 8,057,150 fat sheep of 10 stones each.’ He rejoiced that the subject had now been taken up by many practical farmers, and that so great were the improvements which had been effected in machinery, that it was in the power of any farmer of ordinary intelligence to use the agency of steam with advantage. It was no longer a question whether or not steam could be applied to the cultivation of the soil; it was so applied, and any man who walked over land where the steam-cultivator had been used, however prejudiced he might have been previously, could not but admit that he never saw work performed so well by means of horse-power. If by the use of steam they could avoid the enormous cost of horses—an expense which he thought was rather underrated than exaggerated by Mr. Mechi—the farmer must be proportionately benefited; and while he was benefited, the nation would be so, in the production of an increased quantity of food. As regarded the economy of horse-power, it seemed to have been overlooked that there were 52 Sundays in the year, and that on those days the horses consumed without yielding any return. He

knew he might be told that rest rendered them better fitted for work; but to that he would reply, that the steam-engine would eat nothing on Sundays while it would be quite as ready as the horses were for work on the following day (laughter). If 70 days were set down for Sundays and wet days, there were virtually ten weeks lost, and reckoning the cost of a horse's food at only 10s. per week, there was about £5 per annum entirely lost. Multiplying the £5 by 8, that being the number of horses required for a farm of 200 acres, there alone was a balance of £40 per annum in favour of steam as opposed to horse-power. Steam might be applied for a great variety of purposes in agriculture. When he read his paper before the club, he was laughed at, for expressing his conviction that a steam-engine might be employed in grubbing up a hedgerow. He would again make a short quotation from his paper:—"From what I have seen of the power of the machine which I have constructed, I feel convinced that it might be applied to many purposes. For instance, if I had sufficient time, I meant to have used it to grub a hedge-row; and I feel confident that with the engine attached, it would pull up the roots in the same manner that a dentist draws teeth." Now, he had since applied steam successfully for such purposes as that. With a five-horse engine he had pulled up more than a mile of hedges, and no grub axe would do the work so well. By the ordinary mode of grubbing, it often happened that nearly half the roots were left in the ground; but there was no such defect where a steam engine was used, and he should be happy for any gentleman present to come and witness how beautifully the work was done on his own farm. He had also pulled down hundreds of trees by means of the same agency. As regarded his steam-cultivator, he must say that its performances exceeded any that had been possible previous to its invention. The other day a gentleman visited his farm when he was cultivating the soil with two engines, a six-foot grubber going one way, and a six-foot broad-share going the opposite way; and after the soil was broken up, he pulled a two-foot rule out of his pocket, and pushed it with ease ten inches into the ground. That showed what might be done by means of the steam-cultivator. In conclusion, he would observe, let every farmer who wished to engage in that kind of operation take care that the tackle, or whatever might be used as a medium, was that in which the power could be best applied and economized; in other words, let him see that the power of the engine was really applied, to the fullest extent practicable, to the implement, and not lost in running a number of pulleys, and from an indirect draught. To use a large engine to draw a small machine was a great mistake in an economical point of view. There was one subject which he wished to mention ere he sat down, as regarded economy. He had no doubt himself but their agricultural engines would in a few years be made locomotive. He had brought a model of an engine to show that *Boydell's* argument, that the ground was the fulcrum of a locomotive engine, was correct; and it was of the greatest moment that the subject should be settled amongst engineers, as a great advantage would be lost if the power to propel an engine should be applied in the wrong place.

Mr. FOWLER (28, Cornhill) had listened with great interest to Mr. Mechi's paper, and considered it well worthy of the attention of farmers. He agreed with that gentleman that the average depth of cultivation on the heavy lands of this country was from 4 to 5 inches, hardly ever exceeding 5. Four horses were equal to a draught of about 6 cwt., supposing them to be in first-rate condition; but perhaps 5 cwt. was about the average, and with the best assistance on the part of the labourers, 5 inches was the outside depth of cultivation on heavy lands. By steam-power, on the other hand, they got a draught of 30 cwt., which was about the utmost draught that could practically be applied to the land. Moreover, they got by means of steam an entirely new system of cultivation. There was many a farmer who would not farm heavy land on any account; but he believed that with steam power such land was worth double what it was without that auxiliary, owing to the simple fact that six times as much power might be applied as could be previously. In heavy-land cultivation a ten-horse engine would accomplish three miles an hour, and do the work of 40 horses; and unlike the horses, it would do its work without at the same time injuring the land. As regarded the economy of horses, he would remark that with steam cultivation he had seen only six horses employed where twelve used to be employed, and ten horses where fourteen horses and fourteen oxen had been used. If an additional number of horses was required in the autumn, it would be easy to purchase them, and if they had afterwards to be disposed of, the season would be at hand when horses were in great demand. He did not suppose that the time would ever arrive when the use of horse power on farms would entirely cease, but he believed that there would soon be a great diminution in the numbers employed throughout the year. As regarded the practical adaptation of mechanical appliances to steam, his own impression was that, after a series of experiments, which were exceedingly costly, the manufacturers had arrived, as it were, at a standing point, and that they could now offer to the farmer a machine which might be worked well with a moderate amount of skill, and also of wear and tear; and the meeting would agree with him that on the mechanical appliances must depend the question how far steam might be made to supersede horse-power.

Mr. HALKETT (30, Chancery-lane) said—As Mr. Fowler has been so good as to allude to my system of steam cultivation, and Mr. Mechi has done me the honour to refer to it in commendatory terms, allow me to make a few remarks upon the subject. My system consists of laying down rails over the farm, the cultivating implements, and carts for the carriage required on the farm, travelling upon these rails. Both the following advantages are thus gained to an extreme—the softest and deepest bed for the plants, and the hardest road for the passage of carts and implements. Under the present system of agriculture, the ground being more and more cultivated by the modern requirements of deep and fine tillage, of which we have heard so much to-night, is becoming more than ever an unfit medium for the economic cartage of the farm; whilst, on the other hand, the trampling and pressure in cartage, and all the other operations of the year, annuls, as well as man can do it, the effect aimed at, of keeping the ground in a state suitable to the plants. Again, the system assures

a perfect operation of the implements, the rails forming the guides, and thus all the operations of the field are enabled to be brought under the power of the steam. Let us now see the value of these advantages in other operations, besides those of ploughing, grubbing, subsoiling, rolling, harrowing, &c., which I do by steam. On some lands, after a long continuance of dry weather, followed by perhaps two days of rain, and again fine weather, the surface is dry, but underneath the soil is soft and deep: the whole is as tender as possible, and might almost be hoed with a feather. The gardeners will at once stir and hoe the ground, bringing up the black mould in strong contrast with the fresh green plants; for the weeds will now spring into rapid growth. And if the farmer can yet go upon his land without injuring the plants, he requires many days to hoe them, whilst in a short time the surface becomes again hard and caked, and covered with weeds; or perhaps more rain will still further delay the operation. But on my system I can hoe from 150 to 200 acres in twenty-four hours with the greatest precision, without putting a foot on the land. So again with seeding—I am enabled to seize a favourable moment in the weather for crumbling the earth fine, or for putting in the seed. In twenty-four consecutive hours 150 or 200 acres of land may be drilled. The manner of carrying out the various operations I will not allude to to-night. I refer gentlemen desirous of examining the subject to the professional papers of December, 1857, read at the Freemasons' Tavern, and of 1858 before the Society of Arts. But allow me to draw your attention to parts of the subject not before discussed. Let me, for instance, consider a rotation of crops, taking first the grasses. Inasmuch as by my system the carriages run upon the rails, the economic advantages are so great that I am enabled to cart water, and distribute it on the land at 1s. per acre, giving about 3,000 gallons on that space. Secondly, I am enabled to mow by the machine at less than 1s. per acre; and I can cart the large crops which some of the artificial grasses will yield, if watered and repeatedly cut, at an equally reduced charge. If this be considered, it will be seen what a large head of cattle may be supported with summer food, besides raising a great quantity of manure. The root crop also, for the reasons before stated, of better cultivation, and from the great abundance of manure, will yield much larger crops—and an increased quantity of meat will thus be raised—whilst the land being richer, the cereals also will bear heavier crops. When, independent of all these advantages, it is found that I can cultivate land at £1 per acre less than it can be done at present, after paying all expenses for interest and renewal, will it appear strange that if the profits afford thus a very large interest upon the capital laid out, I should look for the system to be adopted as a matter of course? The amount of the money required is of no moment at all; in fact, the greater amount the better, if the interest be large, and upon what security can a man expend capital better than on land? All that is wanted is, to ascertain that the system is true. I grant there is a difficulty at the present; for the farmer who takes the greatest interest in my system (and there are several present here who I believe will corroborate my statements of the work done) is not willing to lay out capital on his landlord's property; whilst the latter does not sufficiently appreciate the system to risk its adoption. But when proved, money may be borrowed for the purpose, the same as for drainage; or a landlord, receiving say £2,000 a-year, by selling a portion of his land, will be enabled to lay down the remainder on this system. And if he then receives, after paying for renewals, a net income of £4,000 a-year, there is but little doubt that his example will be followed wheresoever it can be.

Mr. ACTON (The Temple) expressed a hope that all these improvements would not have the effect of displacing manual labour in the cultivation of the soil, and an apprehension that the landlords would take advantage of them for the purpose of raising rents (cheers and laughter). He trusted that such schemes were not more injudicious than solid, or more curious than wise (laughter).

Mr. COLLINSON HALL (Navestock) believed that Mr. Acton might dismiss his fears with respect to the labourer. He (Mr. Hall) had applied steam more extensively, perhaps, than any of his neighbours, and yet he employed more labourers than his neighbours, with the further advantage that he had a higher cultivation and produced a greater amount of food (Hear, hear). His own desire was to see the working-man less laboriously employed with his body and more actively occupied with his mind (Hear, hear). He believed the time would come when the farmers might reduce their horse-power one-half; but it would not be advisable to do that until their land was in a higher state of cultivation than it was at present. Let them keep both engines and horses until it was in a better state of cultivation. With regard to the use of high pressure, many years ago he saw that there was a difficulty in profitably introducing steam into agriculture, inasmuch as farmers estimated the cost of their horses at half-a-crown a-day, whereas in commerce a horse cost five shillings a-day; and, whilst an agricultural labourer was considered to be worth one-and-eightpence a-day, a workman in Manchester would be worth five shillings a-day. Consequently, if he burned the same proportion of fuel that was consumed in Manchester, he had cent. per cent. against him to make it profitable. He came to the conclusion, therefore, that in order to make steam profitable, he must get as economical machinery as he could, and that he ought to consume the smallest possible quantity of fuel. At that time he paid 11s., and went six miles for the fuel. That made the cost of the fuel nearly double. The problem he had to solve was, if a certain amount of power came out at 50lbs. pressure, what power would come out at 200lbs. pressure? In conversation with many practical engineers he found that most of them differed from him; some few only gave him encouragement; none would make his engine (laughter), inasmuch as they feared it might damage their reputation if they manufactured what was so completely theoretical, and any accident happened. He was, therefore, obliged to construct it in his own farm-yard. In 1851, he commenced an engine of 200lbs. pressure, then another of 320lbs. pressure, without any accident, for the simple reason that the power was relative to the strength. He took care, if he went much beyond the point to which engineers had previously gone, to go still further relatively with the strength, and he maintained that with his 320lbs. pressure he had greater security than was obtained from the ordinary strength they had been accustomed to. Of the fact that the application of steam to the cultivation of the soil would increase the produce there could be no question. With regard to the prospects of the future, Mr. Smith had told them, as the result of his own experience, that there was a difference of one quarter of corn per acre between steam and horse culture. He believed that would prove to be correct, and in that case it would be impossible to doubt the great and solid advantages of steam. In conclusion, he begged to thank Mr. Mechi for the very sound and enlightened views which he had propounded that evening upon the subject. (Cheers).

Mr. BEALE BROWNE (Andoversford) said they must all feel indebted to Mr. Mechi for his able and useful paper, and he congratulated his friend Mr. Williams upon having lived to see his pet-child attain to such a stage of maturity. He

could also deservedly commend Mr. Fowler for the utter absence of all personality, which characterized the tone of that gentleman's remarks. There was, he (Mr. Browne) believed, no man, who had anything to do with agriculture, who would not soon highly value steam cultivation. He would like to see it applied to almost every operation on the farm—ploughing and cultivating the land, taking out the manure, sowing the seed, cutting down the corn, bringing home the harvest-waggons, and so forth; and he could not help thinking, from what he had seen at Salisbury the year before last, that a part of the lion's share would, after all, fall to the traction engine (Hear, hear). One part of Mr. Mechi's paper which had much struck him was the allusion to the depth at which a parsnip had grown on Mr. Dixon's farm. Now that he fully believed, and it proved that they could not cultivate the soil too deeply for roots. No one could calculate how deep they might go. On the other hand, his experience with regard to the cultivation of corn was, that if his land was clean, the less the depth of cultivation the better. All he wanted was just a seed-bed, whether for wheat, barley, or oats. Mr. Mechi had compared the amount of steam em-

ployed in agriculture with that employed in manufactures. He himself was somewhat of an amphibious animal—he had had a great deal to do with manufactures as well as agriculture, and he did not think Mr. Mechi's comparison was altogether a fair one (Hear, hear). At the present moment we were only in the infancy of the application of steam to agriculture, and to make the comparison fair we ought to look forward a few years; and he believed that whoever amongst themselves lived twenty or thirty years would be perfectly amazed at the amount of capital which would then be employed in steam-cultivation. He thought that when farmers saw their way a little more clearly they would not be very far behind manufacturers in the use of steam (Hear, hear).

Mr. MECHE, in reply to Mr. Browne, asked why agriculturists had been so long blind to the advantages of steam when manufacturers had had their eyes wide open? He would forgive them, however, if they would only make haste to follow the example of the manufacturers (laughter).

Thanks were then voted to Mr. Mechi for his paper, and to Mr. Thomas for presiding, and the meeting separated.

THE USE OF MALT LIQUOR IN HARVEST WORK.

SIR,—A few days since I found myself enjoying the hospitality of a gentleman in Bedfordshire, a county magistrate and landed proprietor, who was desirous of influencing the farmers in the neighbourhood to abandon the practice of paying part of the harvest wages of their labourers in malt liquor instead of money. We numbered about fifteen Bedfordshire farmers, the chairman of quarter sessions, a retired captain in the army, and a neighbouring clergyman, besides some visitors from a distance—one a well-known London minister—and four farmers from various parts of the country, who having tried the proposed innovation themselves, were invited to meet their brother-farmers in this manner for discussion upon it. After a pleasant social meal, the question for the evening was introduced by our host's saying it was not to be a temperance meeting, but a friendly conversation on the advantages, in a business point of view merely, of abandoning the use of malt liquors in harvest, or at all events of giving them as part payment for labour done. Then a Gloucestershire farmer, a tried and trusty advocate of this reform, gave his opinion, that not only were those drinks useless but pernicious, to a hard-worked harvestman. He had worked when a young man as much as any one: he knew both sides of the case, and he had no hesitation in declaring that the labours of the harvest-field and the stack-yard could not be conducted to the best advantage unless all intoxicating beverages were abandoned; and this statement he supported by numerous facts, arguments, and anecdotes of his own experience. His advice was that the men should be paid in money only, and left to provide themselves with such beverages as they chose: his own men used cocoa principally. An animated discussion followed: questions were asked, objections started and replied to, difficulties removed, and the evidence of the other farmers from a distance candidly considered; but, in the language of the police reports, it tended only to corroborate that of the first witness. Some further particulars were, however, elicited, showing that modifications may be advantageously introduced, according to the special circumstances of a case; as where the men are working a great distance from their own homes, it is an advantage to have tea or something similar provided for them by the farmer on the

spot, or at the least to have a facility afforded for obtaining hot water.

As to the finances of the subject, it appeared that by the adoption of this plan, a saving of from 8d. to 1s. 2d. a day might be effected, which, it was agreed, the men ought to receive the full benefit of.

The most important testimony, however, was that given by two of the Bedfordshire farmers, who stated they had seen the experiment tried to a limited extent during the past year by one or two men in their employment, who, they admitted, did their work as efficiently without beer as with it, saving more money for the use of their families, proving more valuable servants to their masters, and more respectable and worthy members of the community.

More than three hours having been spent in this way, we again surrounded a well-spread table, and soon after separated, an impression having evidently been made in favour of this new doctrine on many minds, and in some cases the determination to give it a fair trial was fully expressed.

It is to be hoped that, for the first year at least, some special effort will be made by those who adopt the plan to remove any prejudice that may exist in the men's minds with regard to it. The great point is to let them clearly see that it is intended for their advantage, even more than for that of their masters.

Trusting that you will think this to be a matter of interest to your readers, and that it may encourage others to "go and do likewise," I remain, Sir, yours respectfully, Y. H. N.

"THE USE OF MALT LIQUOR IN HARVEST WORK."

SIR,—A friend has sent me a letter under the above title, signed "Y. H. N.," which appeared in a late number of your journal. Will you permit me to direct the attention of the writer and his friends, who take so warm an interest in this deeply important subject, to a little work published by Houlston and Stoneman, London, in 1848, the production of a distinguished man, who occupies the position of physician to the Queen—Dr. John Forbes? It is entitled

"Temperance and Teetotalism. An Inquiry into the Effects of Alcoholic Drinks on the Human System, in Health and Disease."

In this little work, which is sold for the small sum of three half-pence, is to be found a large amount of most valuable information on the very points discussed by "Y. H. N." and his friends, at that interesting meeting to which his letter refers, all tending to prove in the most convincing way, not alone the value of teetotalism as a sustainer of health and strength under the most varied and severe employments, but the positive injury done to the working man by the use of alcoholic stimulants.

Dr. Forbes's illustrations are taken from agricultural and other labour both at home and abroad, in temperate and in tropical climes, and I do not think any candid inquirer could avoid being deeply impressed with their force. Indeed, the teachings of science, as well as of experience, are all in favour of an entire abandonment of the use of intoxicating liquors by men in health; but those teachings are more than neutralized by the desire for these stimulants which the use of them creates.

While writing, I am interrupted by a lady, whose simple story is but a repetition of the sorrows which many have to endure from the cruel cause to which I am referring. She resides in London, and has come over to Dublin to try and save her brother, who has lived in this city for several years, where he has had employment as a clerk and commercial traveller, but who has become addicted to habits of intemperance. Her only hope of saving him lies in getting him away from the temptation, which has often (although he is but 33 years old) proved too strong for his resolution to amend. She would wish to place him—and he is willing to go himself—on board a temperance ship.

Are we teetotalers mere visionary enthusiasts when we appeal to our countrymen on behalf of such sorrowing ones as these? Is such misery to exist in our midst, and to an extent which it is appalling to contemplate, and must we plead in vain when we appeal to the sober and the intelligent to aid us effectually in banishing for ever from our land so great a curse as the liquor traffic?

Excuse this digression from my main object, which has been caused by the affecting circumstance I have narrated. A young lady has come all the way from your great city on this errand of affection; but the craving for an accursed stimulant, fed by the heartless liquor traffic, will, I fear, defeat her purpose.

Such meetings for discussion of the subject as your correspondent refers to, will, however, do much good. By-and-bye the light of truth will break in upon the thick darkness which yet surrounds us, and the voice of a united people will prohibit the common traffic in poisons which blast the fairest human prospects, and which, in return for all the misery they inflict, have not even one single blessing to place in the opposite scale.

Both employers and their men yet need enlightenment on this subject; and it is with a view of pointing out to inquirers trustworthy evidence to guide them to sound conclusions, that I recommend to their notice the little pamphlet I have referred to: it contains a mine of information on the subject.

Working men need be under no apprehension that injury to their health will result from their disuse of strong drinks. Two thousand physicians of the United Kingdom have signed the following declaration:—"Total and universal abstinence from alcoholic beverages of all sorts would greatly

contribute to the health, the prosperity, the morality, and the happiness of the human race."

Stronger words than these could not be penned to prove the inestimable value of teetotalism. What have we on the opposite side? Nothing—nothing but appetite and folly. A distiller, with whom I was once arguing the question, said to me, "We'll place the folly of mankind against the wisdom of mankind, and we'll beat you teetotalers ten times over."

This is the simple truth of the matter: folly is our destroyer, and it confounds the wealthy as well as the poor, the learned as well as the ignorant become powerless when they allow appetite to get the mastery over reason.

For a quarter of a century moral suasion has been put forth energetically in these kingdoms to stem this torrent of evil, and it has done much good; but, as the flood rolls on still, the energy of the people is aroused to stem it effectually by the added force of legislative enactment. The traffic is doomed, and however great the wealth and influence of its supporters, it will fall, and fall soon, I hope, amid the rejoicings of the entire nation. The British Lion is aroused, and he will overthrow this his greatest enemy, and it will be the most glorious victory he ever gained.

I am, sir, respectfully yours,

JAMES HAUGHTON.

35, Eccles-street, Dublin, April 29.

LEGISLATIVE OBSTRUCTION TO AGRICULTURAL PROGRESS.

SIR,—Although the British farmers have astonished all the world by their forwardness in agriculture, which has been greatly delayed, long checked, and obstructed for the want of tenant-right, *alias* justice between landlord and tenant, which the *Mark Lane Express* has for years been trying to obtain, at the same time has been proving the game laws are a great hindrance and injury to all good farming, many farmers would be glad to know what our Parliament has done for the British farmers to benefit or enlighten them. Long speeches, and nothing in them, say they, is murdering time. The farmers require short speeches, with a great deal in them, *alias* a great deal in a little; instead of a little in a great deal of froth. But it is, as it was in all ages:

"Zeal for public good with men are rare;
But for self-interest that's the chiefest care."

Does our Parliament keep pace with the times? The old adage says, "Go to war with as many as you can, and with a few to counsel."

I have read of Ancient Greece being well governed by seven wise men. Suppose a grandee, *alias* China gentleman, were to ask our English legislators how many acres of the staff of life does England produce yearly, they would find themselves at as great a loss as an Ethiopian, Tartar, or Arabian. Let the farmers mind whom they depute to get their grievances redressed, that they do not turn round upon them and be their greatest grievance.

The immense waste of the sewage of London, which if properly applied is worth £3,000,000 yearly, shows that our Parliament has not kept pace with the times, and has checked progress in agriculture. Tenant-right has worked well in North Lincolnshire, and is a fine example to all the world. It is vain and ridiculous to say that justice between landlord and tenant would not work well in any county or kingdom.

SAMUEL ARNSBY.

Millfield, Peterboro', April 26th, 1859.

THE PUPIL SYSTEM.

Without abandoning the position taken in our last letter respecting the impropriety of farmers presuming to undertake duties they are either disinclined or incompetent to fulfil, it may be as well, perhaps, to express our conviction that parents and guardians are quite as much to blame in this matter as the gentlemen who receive young men.

This disposition in parents, however, to place their sons with any one rejoicing in the title, "practical farmer," results too frequently from ignorance as to the present nature of the farming business, and the character of those acquirements needed by such as follow it for a livelihood. That old notion, that farming is the only alternative for a blockhead, is yet prevalent, and creates a practical difficulty to the management of this question, which can only be reduced and dispersed when a juster view is taken of the science of cultivation, intimately related as it is to the other sciences. Mr. Bond, in his valuable paper read before the Central Farmers' Club, says on this question—"Agriculture, as a purely imitative art, fifty years ago, required no depth of art even in its best qualified professors. There was nothing in a simple course of routine to tax the mental powers. But within the present century how marked the change! We have now the widest field—the most extended scope for intellectual exertion; we have now the whole of Nature's laws opened up for our investigation and research. There is scarce a science but bears directly or indirectly upon the art by which we live; and for a rational fulfilment, and a thorough comprehension of agricultural practice, I know of no profession at the present day requiring a deeper knowledge or a higher degree of intellectual attainment."

No view can be more just than this; but until the view becomes general, or at least until it becomes the decided opinion of those who affect to give instruction and of those who desire to obtain instruction for their sons or wards, no wide improvement may be expected in the education and discipline of the young farmer.

We have seen that for a young man to be withdrawn from school, and exposed to those inducements to indolence which characterise life upon a farm, is most injurious. He may turn out a good man of business; but the chances are that he will not. It cannot be right to leave a youth at that age to his own resources without stimulant, supervision, or direction.

Now, is it likely that agricultural colleges will serve our purpose, by continuing to exercise that discipline in a modified form, from which the boy escapes when he leaves school? We consider that they would tend to further the end in view, and particularly if they were better adapted to the class they are established to educate.

Could we have ten or twelve district colleges in England, each with a staff of professors competent to deal in a practical and efficient manner with animal physiology

and the veterinary art, chemistry, geology, botany, surveying, and book-keeping, a great step would be taken towards creating a system which would be productive of large and permanent results.

The present system—we refer to that pursued at Cirencester—affords a defective model. The course there is too desultory. The majority of the young men who leave that establishment greatly remind one of the celebrated clock at Strasbourg, which was made to perform a wonderful variety of feats beyond simply indicating the time of day, all of which were nearly right, but none certainly correct.

Students should gain an entry to such institutions through the examination-chamber, a process which will prove that their scholastic attainments are sufficient to enable them to enter upon the superior studies without detriment to others, and with advantage to themselves. It seems to us scarcely the province of such colleges to teach reading, and arithmetic, and Latin, &c.; and yet so neglected frequently has been the education of those lads who go to them, that such a practice is indispensable. None should be admitted under sixteen years of age. The course should consist of a certain number of sessions, terminated by a final examination, at which a species of honorary degrees might be conferred. Attention should be strictly confined, as we said before, to the few essential sciences, the laboratory and the hospital being visited daily. And with respect to the hospital, as a knowledge of the veterinary art is of undoubted importance to farmers, we think it would be as desirable to establish as it would be easy to conduct one; for every neighbourhood could furnish subjects, and none are so attached to the antiquated cow-leech as to deter them from availing themselves of the skill of some distinguished practitioner, especially if the charge made only included the keep of the animal during treatment.

The advantage of a farm attached to institutions such as these is very doubtful. Considered as commercial undertakings, the loss would usually be upon the side of the farm. Supposing them to be well located in light land, and heavy land, and grazing districts, the farming thereof, together with peripatetic lectures thereupon, might inform the students quite as efficiently as the oversight of a model collegiate farm.

In these suggestions, we have purposely placed theory—or, to be more correct, science—before practice; not that we undervalue practice, but because we value it perhaps more than those who would place it first. We must know what has been done, before we can do what is to be done in the best manner; and what is this but science? Science gives us data. Pure science is built upon self-evident truths; but the term "science" is applied also to other subjects founded on generally acknowledged truths, as metaphysics; or on experiment and observation, as chemistry and natural philosophy. And

if this is true, certainly it does seem more logical to learn a truth before we attempt to apply it. Would people exercise a little more patience in endeavouring to know what they wish to do before they seek to do it, the world would be troubled with fewer false conclusions, and the confusion that accompanies them.

Besides, it seems natural to suppose that the comprehension is so enlarged and quickened by such discipline, that, in dealing practically with the elements surrounding it, it is enabled, by the light of previous knowledge, to combine, and classify, and apply them with wonderful celerity. The details of farming management are very important. We do not underrate them, because we know that the farmer's profits are extracted from the hundred little sources, implying an amazingly quick supervision on his part, rather than from any one great source. Still we do maintain that the well-informed and active mind is better fitted to comprehend and deal with these petty details, even in many ways we need not stop here to explain, than is a man not so previously trained, all things being otherwise equal.

The reverse of this would never do. Two years upon a farm before such collegiate course would just unfit young men for study; but such study would not unfit them for practice, any more than it does the surgeon or the soldier. What is the meaning of this loud cry for increased education, if it does not mean that education is so to inform his mind and quicken his perception as to make him a better labourer, a better artisan, in fact, a better man of business? Yet our young men are trained in a way that contradict the reachings of sound sense. Without any knowledge of the varied and complicated relations of the materials with which they have to deal, they are pushed precipitately into close connection with them, and expected to raise a building towards the making of whose bricks they have been refused the straw.

It seems very absurd to superintend the process of nutrition in ignorance of the principles of nutrition, or in absence of an acquaintance with the theory of cultivation to undertake its practice. And yet this is done every day; and men seem disposed to purchase their experience in the dearest market to be found.

Those who give a thought to middle-class agricultural education, will at once perceive that it is easier to advocate the establishment of Agricultural Colleges than to establish them. Those who have played with such visions upon their bed, and arisen to transform them to fact, have knocked their shins against the difficulties of the undertaking, and retreated with a zeal as eager to recede as it was to advance.

The belief as yet in scientific training for those who are to farm the land of England, has but a very shallow root-grasp in any part of the country, while in some districts it has never been introduced. When we think of what will have to be accomplished before it becomes general, or at least so general as to produce a college system, a most profound faith in the good sterling sense of our generation is necessary.

Well, the produce of our fields is not stored at once; sheaf by sheaf the stack is formed. And so it is with

all great undertakings, little by little, till the whole stands erect in its perfectitude. Men will not be pushed beyond the measure of their light. It is of no use attempting to make an Englishman, and particularly a stout British yeoman, consent to what he does not understand; though he is Jewed now and then by cattle foods and artificial manures. We mean, however, that, as a rule, the class in question will not advance beyond the turning that is illuminated by their own knowledge. But though they are cautious they are spirited, and once shown the right way, they do not hesitate to follow in it. It is not long since two young men embarked their capital and talent in what was considered a very hazardous scheme, for the manufacture of steam portable thrashing machines. They were cautioned in vain by the prudent. To them, however, had appeared signs unmistakable of an approaching revolution in farm machinery. They perceived the first movements of a growing demand which, by a prompt and large supply, they hoped to increase and to satisfy. They gave a credit to the class they sought to serve for an enterprise which the world generally thought them not to possess, and are now reaping the reward of their discerning faith. So great was the incredulity of other makers as to the amount of business they were doing, that several years after their commencement they were obliged to authenticate their annual statements by the appended names and addresses of their customers. And who would have thought that besides one firm producing one engine per day, numberless other manufacturers would be set working to keep pace with the demand?

And so it will be with middle-class scientific education. The farmers of this country only require to have the notion set before them, that scientific education is absolutely required to fit the rising generation to fulfil their duties with profit to themselves and their country, and to become thoroughly possessed by it, and then we shall behold a bold and intelligent acknowledgment given to the claims of agricultural colleges upon their support. Public opinion is awakening to this necessity. Chemistry and geology and physiology are daily showing their very intimate alliance with the cultivation of land, the growth of cereal and other crops, and the breeding and feeding of all sorts of live stock. Impression after impression is made upon even the slowest minds, and the dullest have long come to know that there are such elements to be dealt with as nitrogen, and carbon and oxygen, and that these are *bonâ fide* elements of profit and loss, and that the man who knows most about them is most likely to handle them to advantage. The step from this initial state of progress to that state of opinion which owns the value of systematic scientific training, and seeks to obtain it, may be a long one, but one, if we judge by the advancement that has taken place within the last fifteen years, which will not be long postponed.

The Emperor Julian remarked that a man who derives experience from his own habits, rather than the principles of some great theory, is like an empiric, who by practice may cure one or two diseases with

which he is familiar, but, having no system in theory of art, must necessarily be ignorant of all the innumerable complaints which have not fallen under his personal observation. And our respected practical friends are fast confirming this gem of Roman wisdom, for they see that a man who receives facts, and does not reason upon them, must be peculiarly the victim of quacks. Perhaps it is because we are so exceedingly practical in England that we are so proverbially victimized by humbugs of all shapes. Amongst engineers, that wonderful theorist George Stephenson fought a memorable battle with the practical ones, the antediluvians, and non-progressionists. It will not be remembered by all of us, but it probably may by some, that the wig makers petitioned George III. to cut off his own hair, and wear a peruke, in order to set the fashion towards wigs. These, surely, were eminently practical men, and so, too, were those who resisted the theory of Mr. Arkwright's machinery, under pretence of throwing the poor out of employ; they must have been too practical, by far, to look further than their noses, giving the most practical rendering imaginable to that scripture, "sufficient to the day is the evil thereof."

But the country has been surveyed in spite of the stones and pitchforks of the practical ones, and travellers are whirled from London to Edinburgh in 12 hours; and Arkwright's invention, by finding employment for some two millions instead of some few thousands of people, has aroused such a loud demand for an increased supply of food, that we are obliged to resort to our laboratories for the purpose of developing the hidden resources, or stimulating the flagging energies of the soil. Thus science has enabled us to satisfy the demand, and as we are required to increase our production, we must inevitably consult her about the means of doing so.

And consequently starting from what point we may,

we are always brought to the same conclusion, that science must be combined with practice; and that science must come first, and practice last.

But the difficulty is to accomplish this systematised scientific training. We know it.

While the agricultural mind is forming, and the foundation for our colleges are being laid, what is to be done?

There is one course that may be recommended, against which can be urged no insuperable objection—nay, we perceive many positive advantages likely to arise from its adoption.

There is a College of Chemistry at Hanover Square, London, where any youth who wishes it may be carried through a course of analysis; and with special reference to agriculture. There is in the same city a College of Practical Geology; and there is also a Veterinary College, with an extensive hospital. A combined attendance at these three institutions, two or three years, would base a young man thoroughly in such branches as must, in his business career, be of inestimable use to him; and he would have the benefit of obtaining as extensive and thorough a knowledge as he might wish at any of the three, of the sciences there taught.

The idea may be novel, but that does not invalidate its merit. When the Agricultural College as now conducted do not work satisfactorily, or while such colleges as those to which we have alluded are being built—as we have no doubt in time they will be—we do not hesitate for a moment to recommend this plan, being convinced that when it is thoroughly executed, and followed up by one or two years' practical acquaintance with the details of farm management, upon the best farms in the kingdoms, there will be produced a race of men better fitted to supply the increasing demand for food than will be produced under the regime at present in force.

F. R. S.

THE PRESENT OF STEAM-CULTIVATION.

SIR,—The great question of steam-cultivation is being rapidly drawn into closer limits. The first problem—Can the land be well and effectually worked by steam-power?—has been solved by several different inventors, and that now before us is essentially a farmer's one—Is steam-cultivation preferable to horse-cultivation? Shall we sell off some of our horses and implements, and purchase a steam-engine, with its ploughs, scarifiers, &c.? Inventors and scientific minds labour to induce us to do this, but the farmers, as a body, shrink from the change they scarcely know why. We constantly hear such expressions as these—"A revolution in farming is approaching"—"Steam must come"; and many tell us it is "at hand"; but scarcely any assert that it "has come." There is much wisdom in this caution; for it is no easy matter to look comprehensively at the results of a change of system in all its bearings, to see distinctly those difficulties which are sure to arise in the adaptation to so different a power; we must be prepared for the prejudices of the men exhibited in wilful and unintentional awkwardness, and for the prejudices of the land too, in the shape of ugly corners and "gores," crooked hedge-

rows and tiresome hills and dales; and we must meet these prejudices by careful consideration beforehand, and steady subsequent watchfulness.

Many farmers are afraid of adopting any one system, lest a more economical one should be discovered soon afterwards; this, with present prices, is something like a drowning man refusing the aid of an air-belt because he sees a boat in the distance. If we are satisfied that steam cultivation in its present stage is economical, let us adopt it, and then we shall be in a better position in a few years to receive an improvement.

My own farm is, I suppose, about an average one; there are some tolerably steep hills; the soil is part gravel and part stiff clay; the fields vary in size from six acres to sixty, all which considerations have led me to pay especial attention to the systems of most general application suited to a tenant-farmer with a lease and an average amount of capital, and this must be pleaded as my excuse for passing with very brief notice one or two plans of great value and ingenuity. For this reason I must at once dismiss Halkett's system in spite of its many beauties and advantages; the day, probably, will

come when it will to a great extent supersede all others, but it will not do for a pioneer in the hands of the tenant-farmer-Romaine's, too, must, I fear, be content with the fertile plains, and leave the hills to others. Fowler's and Smith's appear, to my mind, the favourites, and to them I shall now confine myself.

The chief points which should guide us in forming our opinion are: 1st, the outlay; 2nd, the working expense reduced to the cost per acre; and 3rd, the general application.

First as to the outlay.

SMITH'S.

Steam-engine 8-horse power	£250
Smith's apparatus, including windlass, anchors, beels, pulleys, &c.	110
Patent turning bow	21
1,400 yards steel rope	60
No. 3 cultivator	16
Implements Nos. 1, 2, and 4	43

Outlay

FOWLER'S.

Steam-engine, (8-horse power) adapted to Fowler's system	£305
Windlass, with self-moving anchor, headland ropes, porters, &c.	160
Cultivator	25
Ploughs or other implements	50
700 yards steel rope	30

Outlay

N.B. In each of these cases we might probably reduce the amount of outlay £200 by the sale of some of our horses.

We may now turn to the working expenses.

SMITH'S.

Engine driver	Per day.	s.	d.
Six men at 2s.	"	12	0
Horse and cart at water	"	3	0
15 cwt. of coals	"	15	0
5 per cent. interest on £500	"	1	8
20 per cent. interest on £500 for wear and tear	"	6	8

Total per day

FOWLER'S.

Engine driver	Per day.	s.	d.
Four men at 2s.	"	8	0
One boy	"	1	0
Horse and cart at water	"	3	0
15 cwt. of coals	"	15	0
5 per cent. interest on £570	"	1	11
20 per cent. interest on £570 for wear and tear	"	7	8

Total per day

In these calculations I have put down several sums which can only be approximations to the correct ones, but they will not materially affect the results, which are all we have to do with; and it will be seen that I have at all events given ample scope on the farmer's safe side, by allowing 15 cwt. of coals for an eight-horse power engine, and 20 per cent. for wear and tear; if, therefore, the result is favourable with such assumptions, it must be in practice.

We have now arrived at the cost of a day's work under each system; the next question is, What will each perform in a day? and here it seems to me that much unnecessary complication has been introduced, calculated to create suspicion in the non-scientific mind. In both systems we have the face exerted on the plough, scarifier, &c., in a direct line with the path of the implement, and in each we have supposed the power of the engine to be equal; all, therefore, we require to

know is, how much of that force is absorbed by friction in the two cases; and surely a few simple experiments made by substituting a dynamometer for the implement would at once settle this, and tell us without a shadow of doubt how much available power is left. Of course the absorption by friction must be greater in Smith's than in Fowler's; but it may be greatly lessened by a liberal use of oil, and by increasing the size of the pulleys at the corners of the fields; but by all means let the battle of the ropes, the dispute between the direct and roundabout system be amicably settled by a dynamometric umpire. Till this is done we must guess at it as nearly as we can; and I will venture to put down the absorption by friction in Fowler's apparatus at 1-horse power, and in Smith's at 2-horse power; though I should hardly imagine there would be so great a difference between them. We shall thus have a tractive force of 7-horse power exerted on the implement in the one case, and one of 6-horse power in the other. But the force represented by 1-horse power in a steam-engine is equal to the strength of 1½ horses; therefore, the force exerted on the implement by Fowler's arrangement is equal to the strength of 10½ horses, and by Smith's to that of 9 horses; and this, too, exerted uniformly throughout the day, which must increase the work done enormously; for who has not been struck with the startling difference between the calculated work of a pair of horses ploughing on light land, and the actual work done? Who has not reflected that, walking at the regular rate of 2½ miles per hour—including stoppages and taking a 9-inch furrow—they would plough rather more than 2½ acres in the day of 10 hours; while the work really done seldom exceeds one acre?

Bearing this in mind, I think we may safely affirm that Fowler's arrangement will accomplish in a day, on light land, whatever can be performed by 16 horses; and Smith's whatever can be performed by about 14 horses. Assuming this to be true, we are in a position to calculate the cost per acre of our work.

SMITH'S.

No. of acres ploughed per day, on light land	7
Cost per day	£2 3s. 4d.
Cost per acre	7 = 6s. 2½d.

FOWLER'S.

No. of acres ploughed per day, on light land	8
Cost per day	£2 1s. 7d.
Cost per acre	£2 1s. 7d. = 5s. 2½d.

Here then we have a very great advantage in point of economy in steam over horse-labour, when applied on light land, to the horse's implement, the plough. But this is a small part of the advantage to be derived from its adoption; because on heavy land the absence of "treading," the opportunity of breaking up the land at favourable times, and the power of going to a great depth, present inducements which every heavy-land farmer will thoroughly appreciate. The field on the Prince Consort's Flemish Farm, at Windsor, scarified by Smith's apparatus last autumn, and ploughed lately by Fowler's, is a fair illustration of this remark.

It appears then that the time has come when either of these systems is preferable to the employment of horse-power; and we may proceed to make a few remarks on their respective merits. The difference in the first outlay is not so considerable as to be much thought of; but the expense of the work done, amounting, according to the previous calculation, to 1s. per acre in favour of Fowler's system, is an important con-

sideration. The quality of the work done is a secondary matter, because it must depend on the implement used, without reference to the system adopted. For simplicity—which is a matter of great importance in machinery exposed to rough weather and rough hands—the palm must certainly be assigned to Mr. Smith, whether we look at the engine itself or the anchorage; and he also possesses great superiority, from the fact of his engine being generally stationary: for the progress of Fowler's engine and anchorage tackle must be a fearful objection in very stony, hilly, and wet clay lands. As a general rule, the nearer we approach to the stationary system in heavy machinery on farms the better, as regarding wear and tear and absorption of power. Let us leave the locomotives for dead levels and Halkett rails. In small fields and among crooked fences, I should prefer Smith's, as being more easily fixed and shifted. Where a field is very uneven, there would be objections to each from which the other would be exempt; but probably Smith's would admit of coaxing, to adapt itself to the fields more easily than Fowler's.

When we contemplate the great advantages offered to us by the ingenious inventions and skilful adaptations of Mr. Fowler and Mr. Smith, we cannot help regretting that they are unable to meet in a friendly spirit and combine the great advantages possessed by each, and thus reap a well-earned reward for their mental labours and great outlay by the extensive sale of their apparatus. The very jealousies of inventors are beneficial, perhaps, to the public in the long run, by exciting enterprising minds to devise means to avoid the infringement of patents, and thus to discover unexplored regions—but they are ruinous to themselves.

I have put forward these remarks in the hope that they may tend to produce practical results, instead of paper wars. My own impression is that Fowler's system is more economical and better adapted than Smith's to farms consisting of large, square, well-arranged fields, but that the latter is to be preferred for farms of average size, shape, and arrangement.

I am, sir, your obedient servant,

W. B.

STEAM CULTIVATION.

SIR,—In my last I went a little out of my way for the purpose of noting the method in which Smith's steam cultivating apparatus was handled by one of our mechanical farmers.

I found steam up, and doing good work with a large cultivator drawn through a piece of land which had been ploughed the last time for mangolds. The cultivator was an old-fashioned one, fitted with the "turning bow." It took a great breadth, and scarified 13 acres in fine style during that day.

I passed over some splendid work done by the No. 3 implement a few days before, about which the owner expressed the utmost satisfaction. He seems wonderfully pleased with the "tackle," and very sanguine as to its success. It has enabled him to take another tract of land without adding to his stock of horses.

One great improvement I noticed was, that there were no stoppages on the headlands of the work. This saving of time was effected by an arrangement of two snatch blocks and anchors at each turning point. The new porters were used, which raise the rope entirely from the ground, and reduce the wear of the strands in a surprising manner. These rope porters should certainly supersede those that were at first employed.

I was amused to find that a pair of large drag-harrows had been drawn by the rope, and that an old clod-crusher had been rung in the nose and lugged unwillingly over the great clods.

The steel-rope wears remarkably well. A long reach of chain intervenes between the eyes of the rope and the turning bow, to avoid the wear which was found inseparable from its contact with the implement.

I had a good deal of conversation with the owner of this apparatus as to the future of steam cultivation, and I found him prepared to introduce several improvements in the details. And it is only as this machinery comes into the hands of such men that it will become fitted for general use. Every-day work will soon show its weak

points. Field days are never very satisfactory: there is always so much to allow for, owing to this circumstance and the other, that conclusions founded upon special trials must be carefully received. He condemned very strongly the acrimony which the inventors of the different systems throw into the discussion of their merits. And it is sad that men who are avowedly seeking to elicit the truth, cannot give each other credit for purity of conduct, but must ever impute the basest motives possible to their actions. We have no reason to think that Mr. Smith, or Mr. Fowler, or Mr. Hall, or Mr. Anybody-else are so bad as they make each other out to be. They sometimes forget that there is such a thing as proving too much. As is usual, however, some good may generally be extracted from every evil; and so it is, that out of these personal recriminations most profitable disclosures are made to the public. It is the worst policy possible for two of a trade to quarrel; for then it is that the tricks of the trade are sure to be divulged.

Whether we are to plough or to cultivate, let us not fight about it. Reason must calmly decide. Depend upon it, the farmers of England will not make it a party question. That apparatus which performs the best and most economical work is sure to secure the greatest sale, be the other Fowler's or Smith's, or whose it may. And we cannot judge on this point until we know better the wear-and-tear of Mr. Fowler's machinery and rope. We have already formed a pretty correct notion of what the wear-and-tear of Mr. Smith's tackle is, because the public has given it a longer and more general trial. We must wait a bit for results from the other side, and then strike the balance.

How many a man has made up his mind as to these two systems, but is still waiting for some great improvements! These improvements will not be made, let me say, unless the farmers help to bring them about. They are mainly improvements in detail, which must

be suggested by those who use the machinery, being the fruit of experience. It always requires the combined skill and knowledge of two parties to produce a good implement—the practical mechanist, and the practical farmer. The question to be answered is, Does what we have at present presented to us offer decided advantages over existing modes of cultivation? If so, adopt it. There is a loud affirmative reply given to this question by all who have used it with discretion. While those who are in favour of this system are waiting for some improvement in detail, they are losing a benefit that might be worth to them, in one year, the entire value of the rope, windlass, tackle, engine, and

all. What I saw upon my friend's farm quite convinced me of this.

There are many observers, many watching the course of the plough and the cultivator. Let us receive more frequently some extracts from their note-books. They should keep the public mind well posted-up in this matter. The question of steam cultivation is of vital importance to us; and we require information upon it from all sources, and most of all from impartial sources. Let the partial ones be quiet, and the impartial ones make their voices heard.

Yours, A FARMER.

AN AGRICULTURAL BENEVOLENT COLLEGE.

TO THE LANDOWNERS, FARMERS, AND OTHERS CONNECTED WITH BRITISH AGRICULTURE.

GENTLEMEN,—In a country like England, teeming with philanthropy, and exhibiting such evidences of her greatness in the profusion of her charity; where science, the arts, commerce in all its extended ramifications, the church, the naval and military professions can each point with pride to its palatial asylum, erected and supported by the bounty of those whose hearts and purses are ever open to assuage and relieve the wants and necessities of their suffering fellow-creatures, where, by their charity, the infant is nurtured, the orphan clothed and educated, the invalid relieved and cared for, and the aged, whose only sin was poverty, and whose only crime was misfortune, is enabled to end his days in comfort. While in this holy cause millions are annually dispensed, wide-spread through every class and creed, Agriculture, employing the largest invested capital, representing as she does the most important interest of the country, stands out—made as it were more conspicuous by its very absence—unrepresented, unable in such a glorious list to point to any refuge for the unfortunate British farmer, to any asylum where his orphan can find a home, or his widow a resting-place. To remove this blot from the agricultural escutcheon is my object in addressing you. Why should agriculture, when a whole nation is brimful with charity, be in the rear of good works? Why should not we, as agriculturists, have our college for the reception of those of our poorer and less fortunate brethren, and our school where the poor orphan can be fed, clothed, and educated? Such not only can, but must be done, if we are to maintain our position as an enlightened and advancing section of the community.

If we reflect for one moment, wherein can we discover a reason why the plodding and industrious farmer should be specially screened from the frowns of fortune, or those vicissitudes which are the painful lot of every other class? why should he expect to be exempt from that stern misfortune and bitter poverty which we see so frequently too painfully illustrated in every other department of daily life? None can say

that his risks are less frequent, or his chances of success more certain. Why, then, should he in his suffering and his tribulation be shut out and excluded from the enjoyment of that support and sympathy which are diffused so profusely throughout the length and breadth of the land, for the benefit and solace of every suffering class but his own? Let us remove this reproach. Let us assume that place in so noble and charitable a list, which the influence and the dignity of agriculture demand, and I am assured the bare mention of such a project for the amelioration and relief of those who, while suffering, complain not, will speedily realize such a happy and much-needed consummation. Towards the fulfilment of such an object I have received promises of hearty and zealous support from some of the leading agriculturists and implement manufacturers in the kingdom (a few of whose names I annex), who most cordially sympathise with the suggestion, and I now solicit from you a promise of support and assistance.

As soon as sufficient replies are received, a public meeting will be held, a committee appointed, and then I have good reason for hoping to secure the recognition and the patronage of the consort of our much-loved Queen. Praying an early and affirmative reply,

I am, gentlemen, yours faithfully,

J. J. MECHI.

Tiptree Hall, near Kelvedon, Essex, April 29.

THE RIGHT HON. LORD RAYLEIGH.

MESSRS. RANSOMES, Ipswich.

JONAS WEBB, ESQ., Babraham.

MESSRS. GARRETT, Saxmundham.

R. NICHOLSON, ESQ., Much Hadham.

MESSRS. HOWARD, Bedford.

[A first list of the supporters will be published in a few days.]

ON THE DISEASES OF CULTIVATED VEGETABLES.

[TRANSLATED FROM THE FRENCH OF THE "JOURNAL OF PRACTICAL AGRICULTURE,"]

SIR AND HONOURED COLLEAGUE,—You have told me that it enters into the plan of your useful journal to announce useful publications; I therefore, for the benefit of your numerous subscribers, am about to speak of a treatise on the diseases of cultivated vegetables, the author of which is M. Jules Kuhn, economic director of the comtal domain of Eglöfstein, in Silesia. This book, which calls for all our forbearance, because it is wanting in agricultural science, bears for title *Die Krankheiten der Kulturgewächse, ihre Ursachen und ihre Verhütung*; that is to say, "The diseases of cultivated vegetables: their causes, and the means of preventing them." It is accompanied with seven lithographic engravings, which represent all the details of the rise and development of the vegetable parasites so injurious to our large culture.

I have stated that the work of M. J. Kuhn fills up a blank in agricultural science; by this I do not mean that everything it contains is absolutely new. Certainly, as the author himself acknowledges in his preface, we possessed before it an agricultural literature rich in numerous facts; but those facts were scattered here and there, waiting a skilful hand to unite and arrange them. No one was more qualified to fulfil this task than the author of this vegetable pathology. Prepared for a length of time by a profound study of inferior vegetables which live as parasites on cultivated plants, and for a long period having had the direction of the working of a large landed property, he has had the opportunity of making, at leisure, a long and continuous application of his botanical knowledge, and thus combines what is very rare—theory with practice. It is therefore the fruit of his long experience and vast erudition that we shall find in this book, the study of which we cannot too strongly recommend to the agriculturist. M. Kuhn does not pretend to exempt himself from that common law which decrees all human works to be fatally imperfect; he acknowledges, in the first instance, how much remains still to be done to entitle him to a universal suffrage. In the meantime, such as it is, I think that this treatise will render a great service to agriculture, above all when a good translation shall have placed it at the doors of our cultivators.

This is not the place to exhibit all the novelties we meet with in it. I ask only to be allowed to make known a small number which may be of practical utility.

It was generally believed, before the experiments made by M. Kuhn, but without any foundation, and upon simple conjecture, that the seminules or spores of the ustilagoes and uredoes of the cereals penetrate by the radicles of the plant in order to arrive, creeping by degrees, to the leaves and seeds of those vegetables. According to our learned agriculturist, it is not in this manner that things proceed. He shows us, in fact, by the help of the microscope, that valuable instrument which the state of science renders indispensable to every agriculturist, how the filaments, produced by the germination of the spores of these fatal parasites, introduce themselves into the tissue of the straw of the plant,

while young, in order to produce the caries in the grain. He has gone so far as to state, besides, that it is, above all, the neck or the lowest knot of the plant of which the parasite makes choice, in order to introduce its mycelium, doubtless because that is the point nearest the earth in which its seminules germinate. From thence the filaments, of which he has followed the development, pass across the parietes, still tender and delicate, of the cells, and not, as might be supposed, by following the passage of the intercellular meatus, in order to raise itself, by little and little, with the stem, and ascend to the grain, in which it ought to fructify. In affirming the correctness of the fact, the author does not attempt to say how it takes place; that penetration, in fact, is difficult to explain; but vegetable physiology presents analogies to it. For myself, I find in this fact a sufficiently plausible interpretation of the disease of the stems, which consists, as we know, in the accumulation of a mycelium in the first internode or merithal of the straw of wheat.

M. Jules Kuhn has cleared up another important point in science. I am about to speak of the limits within which the germinative faculty of the different ustilagoes is restrained, and of the conditions which favour or retard that operation. Thus, he has discovered that, in order to bud, besides the necessary conditions of heat and moisture, these spores have need of not being entirely withdrawn from the influence of the atmospheric air. From his multiplied experiments on this subject, it results that spores deeply interred in the soil do not sprout; but that as they preserve for more than a year their germinative faculty, it ought necessarily to follow that a field that shall be infested with it, remains disposed afterwards to reproduce it, even though we should sow it with grain perfectly free from the disease; since, brought again to the surface by labour, these spores are still found in conditions favourable to their development. The observations of the author teach us that those of the *Tilletia caries* (*Tut.*) require from fifty-seven to sixty hours to bud; that those of the *Carbon* of oats and barley, sown ripe, require only six or eight hours; and lastly, those of the *Ustilago*, or carbon of rye and oats, may even germinate after the second year.

As to the prophylactic means for opposing these parasites, that which has best succeeded with him, and to which he gives the preference, is the solution in 550 hectolitres of hot water, of 467 grammes of sulphate of copper, very pure. It is necessary that the immersion of the seed wheat should be prolonged at least from twelve to fourteen hours, but it may be continued without inconvenience even for twenty hours.

I shall here close what I have to say of this work. The short quotations that I have extracted from it will suffice to convince you of its importance to practical agriculture, which receives so much lustre from your learned publication, so useful and profitable to agricultural economy.

CAMILLE MONTAGNE,

Of the Institute of France, and of the Central Society of Agriculture.

SUMMER GRAZING—THE GRAZING OF CATTLE.

A too frequent recurrence to the same subject needs every apology from stated writers; but the importance of the above subject to graziers, and the rapid increase of the numbers who read the *Mark Lane Express*, is a sufficient reason for again introducing the subject. I am not, however, about to write anything expressly new, or perhaps of much value to the experienced grazier; but amongst the many readers of the above paper, there are young readers who would like to "gain a wrinkle" from an old grazier, or to be reminded of some common things which may have escaped their present observation. It is for these I write a few remarks upon summer grazing in these papers. 1st, cattle; 2nd, sheep; 3rd, horses, &c., &c.

The grazing of cattle, the fattening of cattle, the lands adapted for the profitable fattening of cattle must be of first class order. No inferior grass-land will do it, unless aided by a very liberal allowance of linseed-cake or other fattening food; nevertheless, we have good grass lands of varied quality and power. The most powerful will fatten an ox of 100 stones weight without such aids; and others of such sweet and nutritive herbage on inferior soils as will fatten a Scot or a Devon admirably. What I mean is, that the grazier must adapt his cattle to his land, or make up for either deficiency in artificial aids as food. No grazier should, however, attempt to fatten cattle on land not suited for such purpose; and this is soon generally known by the experience of every occupier, and on every occupation; and new tenants often injure themselves by not taking timely advice on this point. The best bullock-lands: These are usually grazed by superior cattle, and I take it for granted that the general testimony and practice on such lands is correct, and in the average of years the most profitable. One thing I know, the occupiers of these beautiful lands are almost invariably to a man proud of them, and proud to see grazing upon them such splendid animals. This is one of the pleasures and gratifications of business. What grazier does not enjoy, intensely enjoy his evening stroll amongst a herd of first-class animals, all progressing favourably; and may he not justly exult a little now and then in the prospect of showing them at his favourite fair, and to his old round of friends and customers? I confess to such occasional pride, and I approve it. It gives stimulus to exertion, to care, to selection, to management in all its phases. This is all right; but there is another view to be taken as to the most profitable grazing of such lands. It is not that every grazier possesses a long purse, and is able to buy such ornaments to his field. What must the poor grazier do? I have seen some of the most powerful bullock lands grazed by very inferior cattle—aged cows, bull-legs, worked oxen, coarse steers; in fact, such a class of animals as only such land "could move," and which was well known to

the occupiers: these animals often come in at little cost, and pay handsomely. I once saw a large and beautiful field of first-class land grazed by aged cows and a few coarse animals which would not average above some six or seven pounds each; the profit was, I understood, very great. The care requisite in such a case is to obtain such animals as will bear a profit under such strong succulent herbage. If the animal is weak in body or constitution, it is certain to go wrong. It is, therefore, manifest that first-class land need not of necessity be grazed by first-class animals; but it is necessary that every animal grazed on such lands must possess a good constitution and aptitude to fatten and improve.

To graze profitably, the grazier must first take care to provide a good pasture. This he will do by "laying in" his fields early, so that he may commence stocking early. His next care will be to put in his stock in suitable weather, and in number proportioned to his keeping. He must not in any case overstock; if he does, in all probability he will lose his season. His stock must have a sufficiency of grass, but not more, or it will grow coarse and unpalatable, and the stock are thus confined to those sweet spots on which they delight to brouse, often very bare and insufficient for their profitable advancement. Should such be the case, it is but to mow down gradually and daily every rough spot, and leave enough for every day's consumption. Cattle are very fond of partially-withered grass. There is great difficulty on this point in grazing lands subject to burning in hot weather: such lands "require a covering"; but I cannot think they require such a covering as is sometimes, nay often, seen. I have seen some of those beautiful Herefordshire lands having pastures which, while carrying their usual quantity of stock, would, I think, yield at the same time a ton or more of hay per acre, positively "up to the knees in grass." In Leicestershire I have seen the like; yes, and in many other counties too. Now, if this could with safety be prevented, I doubt not but the grazing would be more profitable. To fatten cattle most speedily and advantageously, the grass requires to be ever new, and always in plenty. A bullock-pasture—*i. e.*, not too young; that would cause looseness or scouring; but a good bite of strong-grown grass, but not old—just in accordance with the old adage, "twelve days old for a bullock." To ensure this, it is often attempted to graze two fields alternately: that is, to lay one in for three or four weeks, while the other is being grazed, and then to bring back the stock as soon as ready. But this plan is objectionable, as requiring a double number of stock for the time being, which tread down a large quantity of most excellent herbage. The better course is to "get off" the forward animals to market, lay in one field, and well dress it over; *i. e.*, knock the droppings and cut up the tussocks or rough places, that all the grass may be

young and fresh, and then turn the backward animals into this beautiful autumn pasture: they will on this seldom fail to get fat. The old-fashioned course is to reserve the best aftermath or eddish for this purpose, and, failing this, to bring them into the hovel or byre for the winter. This is woefully expensive, and seldom pays. If a bullock will not get fat by the above process of grazing, I would advise the graziers to quit him. It is customary with most graziers to reserve a few prime animals for Christmas. I know of no better course than to make the same provision for their benefit as for the backward ones, except an allowance of corn meal or cake amply sufficient to promote their rapid progress—no reasonable expense must be spared to get up a Christmas ox. Butchers will have perfection in their Christmas beef if possible, and don't mind paying for it; short of this it becomes good ordinary beef, and is bought accordingly: very good certainly; but it don't reach the top standard. To achieve this most desirable point, each animal as soon as the pastures are done should have a separate byre or hovel where he can roam at pleasure. He must be sup-

plied with the best of food, *i. e.*, turnips, carrots, cabbage, hay—all of the best quality, the root cleaned and sliced or pulped, and given with the greatest regularity, and then the animal must be left undisturbed. If he can be kept stalled or in a dark stable or hovel all the better, and an occasional or daily grooming is very serviceable. Fattening animals seldom require the services of the veterinary practitioner: the chief point to be observed in keeping them in a thriving condition is to change their keeping if requisite; and this will be principally needed in untoward seasons, or upon an extraordinary flush of grass or similar deviations from common ordinary grazing, as in seasons of drought. The water becomes in many localities pernicious, when it will require much care to avert injurious consequences. Nearly all these matters depend upon the judgment of the grazier. "It is the eye of the master that grazeth the ox." The chief changes in keeping are from a nutritious to old pasturage, from bad herbage and bad water to an eddish or green clover or seeds; or if dry food is indispensable an allowance of straw or hay is highly advantageous.

THE AGRICULTURAL CONDITION OF AUSTRIA.

Although Austria has never been a very large customer of ours, nor are we much indebted to her for raw material or produce, the present position of affairs on the continent seem to render it desirable to glance at its agriculture and financial condition. With a population exceeding 40,000,000 souls, Austria stands in a very low rank among continental nations, both as a producing and a manufacturing country. The value of our imports from Austria range in value from three quarters to one million per annum; and, as regards agricultural products, consist chiefly of from 1,000 to 2,000 tons of bones, from 60,000 to 100,000 quarters of grain, about 25,000 cwt. of currants, 2,000 cwt. of gum arabic, 200 tons of olive oil, 25,000 to 30,000 cwt. of undressed hemp, 17,000 cwt. of grass and clover seeds, 2,000 tons of shumac, 160,000 to 200,000 lamb skins, 7,000 cwt. of tallow, 250 tons of Valonia, or acorn cups for tanners' use, and about 1,000,000 lbs. of wool. The exports of British manufactured goods sent in return are to the value of about £1,000,000 sterling.

The transit trade of goods through Austria to Turkey and other countries has been to the value of £14,500,000 per annum. A very large proportion of the trade of Austria passes the frontiers of the neighbouring German states, from whence the imports have been largely increasing in importance of late years, although the exports to them have been more stationary.

The interests of the nation as a whole, we are told by a recent official report of our minister at Vienna, appear never to have been taken into consideration: the various districts and communes continue isolated from each other; and while the circulation of the popula-

tion is discouraged, no endeavours are made even to facilitate the interchange of the produce of the different parts of an immensely extended empire; as may be seen even in the immediate neighbourhood of the capital, where, during a winter of many months' duration, the roads are still allowed to remain in a state which, by the time consumed in the transport of goods, and by the wear and tear of horses and men, tends very materially to raise the price of all articles of consumption, and by diminishing the profits to lessen the amount sent to seek a foreign market.

In this respect Austria cannot even bear a comparison with Russia, where the main roads—at least leading to the capital—have been solidly constructed, and carefully kept in repair; and where, when winter comes, the morasses freeze, and the snow provides ready-made highways for the sledge of the peasant, who at that time of year being debarred from outdoor field-work, cannot be better employed than in bringing his produce to market. In Austria, on the contrary, although the winter is sufficiently severe to put a stop to field labour for several months, instead of rendering intercommunication easier, as is the case in Russia, it in most parts of the country only suffices to convert into quagmires the ill-made summer roads; and either condemns to idleness a large proportion of the population, or forces them to wear out their cattle in dragging half-loaded carts through mile after mile of mud for a very precarious profit.

Owing to the difficulty of raising money, except at an usurious rate of interest, and the privileges enjoyed by the nobility, especially freedom from arrest for debt, vast districts, capable by a moderate expenditure of capital of becoming in the highest degree productive,

have remained waste and barren—valueless to the proprietor, and contributing nothing to the wealth of the nation. Stock-jobbing and gambling, trading with insufficient capital, and the vile system of lottery loans, and licensed foreign state lotteries, have demoralized the great bulk of the population.

Of about 140,500,000 acres, the computed extent of the Austrian empire, there were, in 1851—

In Forest	44,500,000 acres
Pasture	22,000,000 "
Meadow and Gardens	20,000,000 "
Arable land.....	52,000,000 "
Vineyards	1,740,000 "
Olive, Laurel, and Chestnut Grounds	155,000 "

The agricultural produce raised in that year was—

Wheat.....	67,679,000 bushels.
Rye	99,000,000 "
Barley	74,600,000 "
Oats.....	131,567,000 "
Maize	56,000,000 "
Rice	1,500,000 "
Other kinds of grain.....	17,000,000 "
Pulse	11,000,000 "
Potatoes	142,500,000 "
Wine	622,500,000 gallons.
Tobacco	845,507 cwts.
Flax and hemp	3,098,000 "
Linseed	579,253 "
Hops	72,599 "
Olive and seed oil	647,278 "
Wool	444,568 "

The live stock comprised 3,230,000 horses, 116,210 mules and asses, 3,795,348 bulis and oxen, 6,615,136 cows, 16,801,545 sheep, 2,275,900 goats, and 7,401,300 swine. The consumption of beet-root in the sugar manufactories in 1853 was 5,360,055 centuers (of 123½ pounds each).

Grain has of late years become a considerable article of importation into Austria. In the ten years previous to 1850 the exports of grain from the empire were not very inferior to the quantity imported from abroad; but latterly this has no longer been the case. The withdrawal of so many agricultural hands from the labours of the field for the necessities of the war, and the prospect of incursory ravages and forced levies, with neglect of cultivation, will aggravate this difficulty.

In 1851 the imports of grain and flour exceeded the exports by nearly 2,000,000 cwts., and in 1854 the quantity imported exceeded that exported by not less than 5,630,000 cwts., the total amount named being 6,950,000 cwts.; of this 1,800,000 cwts. were of wheat, of which very nearly 1,000,000 cwts. came from Russia, 600,000 cwts. from Turkey, and nearly 300,000 cwts. from Germany. Of the other grains rather more than 1,000,000 cwts. came from Turkey, 760,000 cwts. from Russia, and 500,000 cwts. from Germany. In 1856 the importation was not so great, and only exceeded the exports by 2,700,000 cwts., which consisted almost entirely of barley and oats. The abundant harvest in most parts of the empire left a surplus of wheat for exportation of 630,000 cwts. above the imports of it. Of rye, Indian corn, peas, and beans the export also exceeded the import by 1,200,000 cwts.

There are no official returns yet published enabling

us to institute comparisons as respects the last two years.

Wool is a very important item, both of import and of export, in Austria, the coarser sorts being imported in larger quantities, chiefly from Russia; while the finer kinds, for the most part grown in Hungary, form one of the chief staples of that country, and are annually exported—to a far greater value than that of the imported—to supply the manufactories of the States of the Zollverein, of France, and of Belgium.

From 1831 to 1840 the annual importation of wool did not quite amount to 50,000 cwts., and from 1841 to 1850 it did not rise to 63,000 cwts.; but in 1851 it was 101,800 cwts., in 1852 it was 135,500 cwts., and in 1853 120,800 cwts. In 1854 the blockade of the Russian ports having stopped the usual outlets for the wool of that country, a large quantity was furnished to Austria, and the import there rose to 291,800 cwts.; in 1855 it was 210,730 cwts., and in 1856 it fell to 184,220 cwts.

Flax and hemp from 1841 to 1850 was annually imported to the extent of about 176,000 cwt. In 1854, owing to the failure of the crop of the preceding year, the quantity was only 91,100 cwt.; in 1856 the importations rose to 207,100 cwt., a large proportion being Roman hemp, and exceeded the quantity exported by 160,000 cwt.

Live stock forms an article of import rather than of export, the former having exceeded the latter in 1856 by 573,000 head, which consisted, however, almost wholly of swine, of which animals the number imported, chiefly from the neighbouring Turkish provinces, exceeded 600,000. Horses are imported into Austria in greater numbers than are exported from it. In the years previous to 1850, the excess of those imported was about 4,000. They appear to be brought in tolerably equal proportions, from Turkey, from southern Germany, and from Russia. In 1854 those imported exceeded the exported by 8,300; but in 1856 the excess was only 2,700.

These statistic details will enable our readers to form a pretty correct estimate of the agricultural resources of the Austrian empire. It cannot escape notice that among the principal imports are many which, instead of importing from abroad, Austria might have been expected to produce in sufficient quantities to have a surplus available for exportation to other countries. With so overwhelming a proportion of the population of a thickly-peopled country devoted to the cultivation of the soil, it must afford subject of surprise that Austria should not only be an importer of manufactured goods, but that she should have to supply from abroad her deficiency of grain, of wine, of cattle, and of horses. With her sea coasts blockaded and shut out from transit trade on many of her land frontiers, Austria will feel the pressure, should the war last. On the Swiss, Russian, and Turkish frontiers, she carried on a large part of her trade, and now she will be restricted to southern Germany, Saxony, and Prussia. The seaports of Trieste, Venice, and France are closed, while the steamers of the Austrian Lloyd's and Danubian companies are withdrawn for fear of capture.

PRODUCTIONS AND PECULIARITIES OF THE NORTH AMERICAN CONTINENT.

But to the intelligent business men of Europe it may seem that a course so suicidal to Chicago would not be persisted in by the Chicago Board of Trade, and, that as a consequence, no diversion of the produce trade of that city may be looked for, but rather a steady annual increase. To this it may be answered, that no relaxation has yet taken place in the St. Louis system, and that the Chicago Board of Trade is the mere exponent of the judgment of the Chicago people. What, therefore, other people may regard as the effect of a particular course, Western people may consider as the cause; but the right way of thinking may rest with those who have no interest either way. The people of St. Louis, for example, may have considered that the position of that city was such as would command the Mississippi and Missouri trade; and with respect to produce, that it was expedient that superior grades only should be bought and sold. Unquestionably it was considered that such was the surest means of securing headway in St. Louis, and it may be thought so still; but people outside of St. Louis, or rather outside of the United States, entertain different views, and make no doubt that if that policy had not been pursued, the produce trade of St. Louis at the present day would have been tenfold greater than it is. The growth of the produce trade of St. Louis would be held by the people of that city to be in a large measure owing to their restrictive system, while other people would consider that in spite of that restriction the trade was being developed gradually; and it is remarkable that so intelligent and numerous a community as that of St. Louis should be distinguished by so little breadth and depth of thought. Familiarity with the unphilosophical views of the protection-to-native-industry party—in fact, knowing nothing but these views can alone account for so obsolete and unbusiness-like a state.

The same wrongheadedness obtains in Chicago. People there, as elsewhere in the United States, do not drive on the same side of the road as people do in England, and, as a general rule, act as contrariwise in other things. In particular, they have come to consider that it is not the produce trade that has made Chicago, but that Chicago has made the produce trade. As a consequence, it is supposed that the produce trade must, as a matter of necessity, conform to whatever rule may be imposed by the sovereign will and sovereign wisdom of the people; and, as exemplifying the egregious length the people are disposed to go, a recent instance may be taken from the action of parties engaged in the lumber trade. Lumber, it may be observed, in a prairie country is a great staple article of demand, and being most extensively used by farmers, goes to balance the account for grain. On the principle, then, that Chicago had made both its grain and lumber trade, it was argued recently that the lumber trade should be made to pay the lumberers better than it did, and with that view strict grades of lumber and close inspections became the custom and the law. Farmers therefore do not now get the facilities and the bargains that they used to do, but in reality are made to pay an over price. Anywhere but in America that course would have been deprecated by the newspaper press, and the common sense of business people; but western busi-

ness people are impressed with the belief that the United States, and Chicago in particular, are "bound to grow," everything to the contrary notwithstanding, and the newspaper press simply echo the vulgar cry.

Here in England, however, we look at these matters in a rational and unprejudiced sort of way. We can understand that if on the one hand, obstructions are placed in the way of marketing grain at Chicago, that grain will seek a market elsewhere; and if, on the other hand, obstructions are placed in the way of the prairie farmer buying Chicago lumber, there will be a double motive for the farmer to make a change. Lumber he can buy on the Upper Mississippi without restriction of any kind; and with an English demand at New Orleans for Western wheat, the mushroom Chicago trade will inevitably disappear.

Upon the continuance of Western trade in the Chicago Channel it has been shown already, and will be adverted to at length in another place, that the hopes of Canada and New York depend. Should that trade seek the Mississippi outlet, the St. Lawrence canals and the Erie canal will become all but useless, and the stocks of Eastern and Canadian railroads suffer serious depreciation in their market value. The present course of Western trade rests on the sufferance, or rather on the inattention, of the people of St. Louis; and should that inattention be not speedily disturbed, the next deficient English harvest will attract the foreign capitalist to the Mississippi and Illinois river market-towns; and while Canada and the Eastern States are in a frozen state, every surplus barrel of flour and sack of wheat will be floated down open water to New Orleans, and nothing left in spring for the Canadian and New York canals to do. That operation once accomplished, the foreign capitalist would find his efforts seconded by the Southern States, and the channels of the Mississippi and Ohio speedily become adapted to the navigation of the largest ocean steamers.

There is no extravagance in these remarks. Chicago, as will be shown presently, receives its supplies of produce from the Mississippi, not by water chiefly, but by railroad; and it is not too much to say that the cost of transporting grain from the Mississippi river to Chicago is equal to the cost of transportation from the Upper Mississippi to New Orleans; and less than the cost of transporting grain from Chicago to New York would cover the transportation from New Orleans to Mark Lane or Liverpool. In a word, grain transported by the Mississippi from the growing western districts would be received by the English consuming classes at a less transportation charge than that now incurred in the transportation of grain from the western growing districts to New York. Could a stronger case be put to the business men of the United States and Europe? and could stronger ground be taken against the mistaken policy of the Canadian and New York canals and railroads?

The following were the grain receipts at Chicago for the year ending 31st December, 1857, by the Illinois Canal and the different railroads:—

RECEIPTS OF FLOUR AT CHICAGO, 1857.

By lake	5,300 barrels.
Canal	12,900 "
Galena Railroad	114,800 "
Michigan Southern do.	5,500 "
Michigan Central do.	3,000 "
Rock Island do.	106,000 "
Illinois Central do.	9,800 "
Burlington do.	84,700 "
Milwaukee do.	1,300 "
St. Paul do.	42,900 "
St. Louis do.	7,100 "
City manufacture	96,000 "

489,300 barrels.

RECEIPTS OF WHEAT AT CHICAGO, 1857.

By lake	8,400 bushels.
Canal	885,500 "
Galena Railroad	3,766,200 "
Michigan Southern do.	11,100 "
Michigan Central do.	13,500 "
Rock Island do.	1,181,400 "
Illinois Central do.	679,400 "
Burlington do.	2,972,000 "
Milwaukee do.	7,300 "
St. Paul do.	279,800 "
St. Louis do.	549,400 "
Teams	200,000 "

10,554,100 bushels.

RECEIPTS OF CORN AT CHICAGO, 1857.

By lake	3,200 bushels.
Canal	4,122,600 "
Galena Railroad	354,100 "
Michigan Southern do.	144,800 "
Michigan Central do.	1,500 "
Rock Island do.	407,400 "
Illinois Central do.	192,100 "
St. Paul do.	6,800 "
St. Louis do.	83,300 "
Burlington do.	1,892,900 "
Teams	200,000 "

7,408,700 bushels.

The three great sources of the flour and wheat supply were the Galena railroad, which extends from Dubuque (on the Mississippi river) across the State of Illinois to Chicago; the Rock Island railroad, which extends from Rock Island (on the Mississippi river), and follows the course of the Illinois Canal to Chicago; and the Burlington and Quincy railroad, which extends also from the Mississippi river, and forms a junction with the Galena and other railroads at a short distance outside of Chicago. The canal formed the principal source of the corn supply, and a large portion was brought from the Illinois river by canal. With the exception, therefore, of corn, the principal Chicago grain receipts were furnished from the Mississippi River, thus confirming what has been advanced as to the precarious character of the present western transit trade.

The aggregate grain receipts at Chicago, and the aggregate shipments, for the year ending 31st December, 1857, were as follows:—

RECEIPTS.	
Flour	393,000 barrels.
Wheat	10,554,100 bushels.
Corn	7,408,700 "
Oats	1,307,200 "
Barley	122,000 "
Rye	86,600 "

SHIPMENTS.	
Flour	255,200 barrels.
Wheat	9,485,000 bushels.
Corn	6,825,000 "
Oats	415,600 "
Barley	169,900 "

Before passing to the consideration of other staple products it will be necessary to recur to observations previously made on the subject of cereal transport. Flour and grain, unlike pork products and hides and tallow, are bulky in proportion to their value, and could not bear a thousand miles' transportation by railroad without unnecessarily diminishing the profits of the farmer, or unnecessarily overstepping the market price at the point of destination on the seaboard. The previous illustration will bear repetition. During the summer 1858 wheat was carried by water from Chicago to New York at 7½d. a bushel, and flour at 2s. a barrel; and the regular railroad tariff would have been 2s. a bushel for the wheat, and 6s. 5½d. for the flour. To have used railroads for the movement it is therefore obvious that the farmer would have had to submit to a considerable abatement from the Chicago market price, or the produce when it reached its destination would be held at a large advance on current rates. But while wheat and flour cannot be transported by railroad from the west to the seaboard, articles of more value in proportion to their bulk are profitably carried; still, so long as the communication of the lakes and canals is open, and a few days' extra time is of no account, commodities of the greatest value are carried east and west by water, the transportation charge being less the one way than the other. But during winter there is no choice, and eastern and European trade requiring beef and pork, and lard and hides, these commodities are sent daily as the cattle and the hogs are slaughtered, the cost of railroad transit being taken into account; and this business is prosecuted in an extensive and vigorous way. But although the hog and cattle product trade is carried on by railroads, and in fact owes its great western development to the railroad system, there is no reason to suppose that in future railroads will become available for the transportation of wheat and flour from Chicago or St. Louis to New York. The American grain trade is not confined to the western section of the continent, as the hog and cattle trade really is; and during winter, when the Erie canal and the lakes are frozen, the Eastern States consume their own growth of wheat and flour, and all margin for extra transportation charge is thus destroyed. To understand this fully it is only necessary to consider that in a great measure the price of grain is equalized throughout the world, and especially is it so throughout the United States. If the crop is full or short, the eastern markets sympathize at once with the markets of the west; and although the supply of western grain is stopped in winter, the existence of the supply, and the certainty of its appearance in the spring, is not lost sight of for a single moment, but exercises as much influence in Broad-street, New York, when stored in Chicago elevators, as when stored at the Atlantic Dock, Brooklyn. Such being the case, prices throughout the winter maintain a kind of level between the west and east; and the range of fluctuation does not admit of railroad transport. The peculiarities of this trade form the subject matter of a special article.

Considering then the great economy of water transit, in connexion with previous remarks as to the ultimate tendency of western trade towards the Mississippi river and New Orleans, it is manifest that the present mode of prosecuting the western winter provision trade by railroad presents no difficulty in the way of transferring that trade to the channel of the Mississippi. In the first place, there would be a large saving in the cost of transportation to the seaboard, the water communication being the cheaper; and, in the second place, every word advanced as to the place of growth of Chicago wheat and corn, applies equally to hogs and cattle. These are bred at perhaps an average distance of two hundred miles from Chicago, and over that distance the hogs and cattle are carried by the railroads.

Less transportation charge would take these hogs and cattle to open water, on the Mississippi, and to New Orleans, thus saving the whole present railroad charge from Chicago to New York. Is such a state of things to be overlooked by the capitalists of the United States and Europe? and if American and Canadian railroad stocks have been recommended to the public, by virtue of the importance of the winter freight supplied by the western hog and cattle trade, the railroad hold of that trade is likely to prove only of short duration.

The following were the receipts of hog and cattle products at New Orleans from the interior for the ten months ending 31st July, 1858:—

Beef, barrels	26,300
Lard, tierces and barrels	110,900
Lard oil, barrels	11,900
Pork, tierces and barrels	273,100
Bulk pork, lbs.	7,357,200
Tallow, barrels	700

The exports from New Orleans for the same period were—

Destination.	Pork. barrels.	Bacon. casks.	Beef. barrels.	Lard. kegs.
New York	39,000	4,000	2,600	130,100
Boston	42,600	2,300	5,400	97,900
Philadelphia	200	—	—	2,400
Baltimore	3,900	—	—	7,600
Other U. S. ports	33,900	19,100	500	21,100
Great Britain	400	—	3,700	77,400
Europe	100	50	700	24,400
Other ports	6,000	200	800	20,700
	126,100	25,650	18,700	381,600

There is thus at present considerable produce movement down the Mississippi, and when on the one hand it is considered that a large portion of the movement is from the Illinois river and the Upper Mississippi, and on the other hand that the bulk of the produce so conveyed finds its way to New York and other eastern markets, there can be no doubt of the suitability of the Mississippi route for every business purpose. And for the reason that these products are shipped to England, and come into competition with the same products of the eastern markets, additional evidence is afforded of the desirability and advantages of trade with New Orleans.

The following were the exports of hog and cattle products from Cincinnati for the year ending 31st August, 1857:—

Beef, barrels	18,700
Beef, tierces	5,000
Lard, barrels	36,900
Do. kegs	51,500
Lard oil, barrels	45,400
Pork and bacon, hogsheads	34,000
Do. tierces	32,700
Do. barrels	100,800
Do. boxes	29,800
Do. bulk, lbs.	909,700
Tallow, barrels	6,900
Hides, lbs.	37,300
Do. number	57,400

What proportion went down the river to New Orleans is not stated in the report of the Chamber of Commerce.

The following were the exports of live stock, and hogs and cattle products, from St. Louis to New Orleans, for the eleven months ending November, 1856:—

Pork, barrels	97,500
Do. tierces	2,400
Do. pieces	8,100
Lard, barrels	18,200
Do. tierces	31,100
Do. kegs	17,200
Bacon, casks	24,500
Do. tierces	5,500
Do. boxes	3,200
Cattle, head	10,400
Hogs, head	11,900
Hides, number	128,300

From Chicago the following were the exports of live stock, and hog and cattle products, for the year ending 31st December, 1857:—

Beef, barrels	44,400
Cattle, number	25,400
Dressed hogs, lbs.	4,329,200
Dressed beef, lbs.	348,600
Hides, number	141,700
Do. lbs.	1,516,300
Lard, barrels	3,600
Do. tons	600
Pelts, lbs.	529,900
Pork, barrels	30,080
Provisions, lbs.	3,463,500
Tallow, barrels	2,100

The following was the estimated aggregate hog crop of seasons 1855-6 and 1856-7:—

	1855-6.	1856-7.
Ohio	633,697	483,048
Kentucky	428,334	349,212
Indiana	482,531	316,629
Illinois	481,258	363,202
Missouri	199,904	143,244
Iowa	172,378	100,322
Tennessee	62,400	42,811
Wisconsin	39,000	15,000
	2,489,502	1,818,468

In addition to the enumerated articles of hog and cattle products, it may be observed that hog skins, suitable for saddlers' work, have scarcely any marketable value in the north-west, and the largest and best skins can readily be contracted for in Chicago at a shilling each. Hog bristles can be supplied in almost any quantity at a price equal to the cost of gathering them.

Shank and leg bones for button manufacture, hooves and horns for comb manufacture, and rough bones for agricultural use may be quoted, free on board, at Chicago as follows:—

Thigh and leg bones .. .	£2 per 1,000.
Hooves	£2 to £2 10s. per 2000 lbs.
Horns	2d. to 2½d. each.
Rough bones	£1 per 2,000 lbs.

The annual supply of shank and leg bones, suitable for manufacturing purposes, at St. Louis, Chicago, and Milwaukee, would exceed one million; the supply of hooves, two hundred tons; the supply of horns, one million; and the supply of rough agricultural bones, two thousand tons. Supplies of hooves and horns have been sent direct from Chicago to the Devanah Comb Company, at Aberdeen, Scotland; but attempts to make shipments of rough bones have failed, in consequence of the high freights demanded by lake vessels. Recently attempts have been made to burn the rough bones for sugar-refining purposes, but the experiment has not succeeded fully.

Hides, pelts, wool, and tallow are yearly becoming increasing articles of export from the west to the south and east. Of the former, the annual production of the north-west is little short of two millions, and that number is likely to be doubled before many years. As yet, hides are brought to market in mixed lots, and ox, cow, and calf are weighed together at the same price. Ox hides in the green salted state run from eighty to a hundred and fifty pounds each; cow hides from forty to sixty pounds; and calf and kip from four to twelve, and from twelve to twenty pounds. Generally the quality of the hides is prime and equal, although often badly cured, and brought to market in an untrimmed state. Hides slaughtered in the summer are usually dried in the sun, and sell at twice the green salted price.

Of the production of wool no approximation to the actual quantity can be made. Considerable domestic manufacture is carried on by the German population, and numerous shipments are made from obscure places, and never taken into account. From Chicago the export of wool, for the year ending 31st December, 1857, was 8,463,359 lbs. The agents of New York and Boston dealers travel through the whole western country collecting parcels, and so keen generally is the competition that the commodity not unfrequently commands more than its real import value.

Tallow is not yet produced to any great extent, but as the beef-packing business is developed, its importance as an article of western export will increase. Usually there exists a fair margin for English shipments, and packers' tallow is now of the choicest kind. Canadians at present absorb nearly all the western surplus.

It may be here remarked that the Canadian production of live stock and hog and cattle products is extremely limited. This is owing to natural causes, rather than to any want of enterprise or thrift on the part of the Canadian people. The wooded character of the province, as adverted to before, checks grazing progress, and beyond running droves of hogs in the bush, and keeping a few cows and oxen, the Canadian farmer has generally enough to do chopping trees and digging stumps. The Canadian production of hog and cattle products is therefore not sufficient to supply local wants, and not likely to be so for years to come; and Canadian lumberers draw pork supplies from Chicago and other parts, while in the winter season the markets of London, Hamilton, Toronto, and Montreal receive regular supplies of live hogs and cattle, dressed beef and pork, and prairie game.

Canadian pork, besides being extremely limited in supply, is very much inferior to western pork, in consequence of the difference of the feed: the Canadian hog subsisting chiefly on beech nuts and herbs picked up casually in the woods; while the western hog is fed regularly, and almost exclusively, on

Indian corn. While therefore the flesh of the one is firm and fat and not greasy, the other is soft and flabby, and its fat usually disappears while being cooked. So prime in fact is western pork that carefully cured hams, such as those met with in Burlington, Iowa, and Cincinnati, are not in the least inferior to York or Belfast; while their market price is generally little more than half. It is the same with bacon, and prime-cured western will challenge competition with the choicest Wiltshire. These statements may appear scarcely credible to those familiar only with the rough salt bacon cured for the Irish market, and who know nothing more of American hams than the smoked or green shoulders so plentiful in Liverpool. But when it is considered that, every other thing being equal, the breed of American hogs being the same as the breed in England, and the feed not inferior, it is easy to understand that if rough bacon and ill-shaped hams are received from the United States, better qualities may be received also.

A considerable proportion of the western packing business is in the hands of Englishmen, and parties resident in the north of Ireland. These repair to the United States towards the close of the summer months, and after perfecting financial arrangements in New York or elsewhere, proceed to the scene of operations. When spring returns the business is given over, and the parties leave the United States and return home. It may be remarked that greater facilities, in a money way, are extended to this business than to any other in the United States; and this circumstance is owing to the easy supervision and check, and to the short time that intervenes between the slaughter of the animal and the marketing of the product. In the packing business there is really no refuse of any kind: every sort of offal being readily convertible into money, and operations may be suspended at any time. The usual financial practice is to draw upon New York with attached freight bills of lading, at sixty or ninety days; and in general before the drafts mature the hypothecation is released by sale at the consigning port.

EMPLOYMENT OF SORGHO AS FORAGE.

[TRANSLATED FROM THE FRENCH OF THE "JOURNAL D'AGRICULTURE PRATIQUE."]

When in your columns, Mr. Editor, you opened an enquiry respecting the qualities of the sugar sorgho of China as a forage plant, you ought to have received the observations of one of the oldest contributors of the "Journal of Practical Agriculture," when to that title was united that of being one of the first introducers of the sorgho.

On principle, and in quality of member of the Imperial Zoological Society of Acclimatation, I have shared in the distribution of seeds sent to the Society by M. de Montigny. These seeds have ripened with me from the first year of their introduction. I cite a fact, not to profit by it, for our latitude (47° 36m.) will not permit us to expect a fructification, constant, regular, and normal, but to let you see that my experiments have from the first continued uninterrupted. A cultivator in Sologne, seeking improvements, I have directed my attention to the sorgho, and its power of vegetation, to call it to my aid as a forage plant; at the same time divesting myself of all preconceived ideas, whether enthusiastic or disparaging. I shall not, therefore, touch the question but to throw light upon honest researches, I will not seek in the new plant a universal panacea for cattle, or a dangerous poison; but to excite a renewed examination. I will confess that the abundance of forage has

won me as it has done others; but with certain facts before me, duly stated, I stopped and reflected. Perhaps in the absence of regular accounts we might have deceived ourselves; but with the figures before us, we can come to no other conclusion; at the same time requesting the practitioners to renew their experiments carefully.

The sorgho is not a violent poison for cattle; but if the effects observed, not only in my cultivation, but also in that of many of my neighbours, be frequently renewed, we ought necessarily to attribute to this plant a deleterious influence. On a farm which I occupy myself, 25 horned cattle have been fed exclusively on sorgho during a month; and from the precise day on which it was introduced in feeding the cattle, the journal of the farm shows a diminution of the profit of the dairy by one-half, and the same decrease was exhibited every month of feeding with sorgho.

On the other hand, there was, in respect to one of the cows, a case of wind, that caused its death. Any other kind of food might have produced a similar accident; but what many of my neighbours have asserted is, the sterility of the cows fed on sorgho. If these two facts, sterility on the one hand and a diminution of half in the production of milk on the other, repeated regularly in consequence of feeding the

cows on sorgho, be corroborated we must conclude from them that this plant is injurious; since it hinders or diminishes all kinds of production by interfering with the secretions, which must necessarily provoke a perturbation in the animal organism; all morbid causes having their origin in suppressions of this nature.

I know that no improvement of the soil is possible without an abundance of green food; and their production regu-

larly successive by a course of cropping, is not always an easy matter. I should therefore regret being obliged to abandon the sorgho. The desire of preserving for a plant so luxuriant, a place in the production of green food, and also, on the other hand, the fear of introducing into the midst of our cultivated plants a dangerous auxiliary, ought to operate as a doubly powerful motive for prudently and honestly renewing the experiments. MARQUIS DE VIBRAVE.

IMPROVEMENT IN THE BREED OF SUSSEX STOCK. TESTIMONIAL TO MR. EDWARD CANE.

On Tuesday, May 3rd, there was, at the White Hart Hotel, Lewes, one of those gatherings which are truly characteristic of Englishmen—the occasion being an acknowledgment of the services of a spirited and persevering agriculturist and breeder of stock, and the individual Mr. Edward Cane, of Berwick Court. We have rarely, if ever, had the pleasure of witnessing so large and influential an assemblage of country gentlemen, agriculturists, farmers, and others; and, considering the object in view, and the great cordiality with which the compliment was paid, the whole of the circumstances attending the presentation must have been peculiarly gratifying to the recipient. We shall briefly state that the testimonial, which was singularly appropriate, comprised: An elegant and richly chased silver epergne or flower-stand, about 2½ feet high, with scrolls and foliage rising from a triangular base, with three shields for engraving. On one side is this inscription: “Presented to Mr. Edward Cane, of Berwick Court, with a silver punch bowl, and portrait of his prize steer, by his numerous friends, for his successful efforts in improving the breed of Sussex Cattle, April 20, 1859.” On the second medallion the initials E. H. C., in entwined ornamental cyphers; and on the third a fox, characteristic of Mr. Cane’s love for the chase. Also a massive and handsome silver punch-bowl, richly gilt inside; a beautifully-framed portrait of Mr. Cane’s prize steer, by Davis, of London; and a neatly executed list of the names of the subscribers. The epergne, which is a splendid work of art, was furnished by A. B. Savory and Sons, goldsmiths and watchmakers, 11 and 12, Cornhill, London. We understand that the testimonial was subscribed for by about 400 admirers and well-wishers.

Soon after four GEORGE DARBY, Esq., took the chair, supported on his right and left by the guest of the day (Mr. Edward Cane), Viscount Pevensey and J. G. Dodson, Esq. (the candidates for the eastern division of the county), Henry Brand, Sir C. W. Blunt, Bart., and R. J. Amphlett, Esq., Q.C., (candidates for the borough of Lewes).

After the usual loyal toasts the healths of Mr. and Mrs. Cane were given.

Mr. CANE, on rising to acknowledge the honour which had been done him, was again loudly cheered. He said—Gentlemen, I feel particularly gratified for the compliment you have just paid me in drinking my health, coupled with that of Mrs. Cane and my family; and I also feel particularly obliged to my old friend Mr. Darby for the kind way in which he has proposed the toast. I beg to say, gentlemen, that this ought

to be, as it really is—the happiest day in my life. I had no idea, six weeks ago, of any intention to present this testimonial to me; it has, I know, been got up by the best of friends, and I assure you that it is highly gratifying to me, more particularly as it is got up in acknowledgment of my exertions to improve the breed of Sussex stock. So far as regards that improvement, permit me to say that for twenty years I have taken great pains, and for this reason, that in my opinion few animals were so well adapted to the great object we have in view as the Sussex stock. I believe it is now about fifteen years ago, that in going into Mayfield and Rotherfield, I found teams with six, eight, or ten oxen, where I now find horses; there is some cause for this; at all events, this particular stock was got rid of, and perhaps some of the parties could not regain it. Gentlemen, for this testimonial I thank you very kindly, more particularly as regards my efforts to improve the Sussex stock. As my friend Mr. Darby has said, I took a prominent part in endeavouring to get a class at Smithfield, and we were successful; I mentioned the subject at Hailsham, Arundel, and I believe at Rye, and I asked my friends to assist me in getting a class; they did so, and I feel obliged to them for it, for I could not by my own unaided exertions have accomplished what we have succeeded in accomplishing. Now, gentlemen, we have got a class; and our show at Smithfield is no disgrace to any county in England, or indeed to any part of the world. I have been successful in carrying off the laurels from time to time, and I do not see, gentlemen, why we should not succeed still further. I can bear my friend out in what he has said in reference to Sussex stock in the market, for I believe there is no better stock comes into the market than a good Sussex bullock. I think, gentlemen, we in this neighbourhood know what good living is; at all events, we are close to Brighton, and I rather think they know there what it is, and fully appreciate our Southdown mutton. Gentlemen, for this testimonial I cannot express to you my feelings, and when I look upon it, allow me to say that I don’t value it for the sum which it cost, though it is not to be valued lightly on that account, but on account of the motive from which it proceeds, and more particularly that portion of your testimonial which bears the names of the subscribers. In the future, gentlemen, I trust we shall live in the same relation, and that the associations which have been begun will continue with equal advantage and honour to all. Gentlemen, I thank you all once more, and beg to drink all your very good healths. Mr. Cane resumed his seat amid loud cheers.

PREMIUMS FOR BARLEY.

The third annual adjudication of prize cups offered by Messrs. Blizard Brothers and Godsall, for competition in barley-growing, took place on Wednesday, May 11, (Fair day), at the Black Bear Inn, Tewkesbury, in the presence of a numerous assemblage of agriculturists and corn merchants.

Amongst the toasts at the dinner, the CHAIRMAN (Mr. Woodward) gave the Health of the Donors of the Cups. He said they had shown an example of what might be done by encouraging competition. As eminent maltsters, they were desirous of procuring the best barley that could be obtained for their manufacture, and in consequence of their liberal offer of these prize cups, the very finest samples had been brought to them for sale. Having thus obtained the best barley, they had naturally been able to produce the best malt, and as a consequence to obtain the best prices for it. He had the satisfaction of stating that a lot of malt (500 quarters), sold by Messrs. Blizard in London lately, had realized the highest price of the season, and also that in Liverpool they had met with similar success. The Severn valley was the warmest valley in England, and therefore admirably fitted for the growth of barley; and Messrs. Blizard, in having given an impetus to its culture, and thus caused an improvement, were entitled to their warmest thanks.

Mr. GEO. BLIZARD, the senior partner, replied. The prize cups they had offered had produced, as was intended, a double advantage—first to the farmer, who was induced to produce a better article and obtain a better price; and next, to themselves as maltsters, who were enabled to get the best kind of grain for their manufacture. The cultivation of barley had, in former years, undoubtedly been neglected: a stimulant had been applied, and as a proof of its effect he would point to the samples of that day, which he firmly believed could not be equalled in any town in England. Undoubtedly some of that success was due to the premiums offered in those cups, for Englishmen were fond of emulation, and if one farmer was able to show a particularly good sample, others would be sure to try to equal it. Mr. Blizard then referred to some remarks he had made last year relating to the machines used for dressing the barley. He regretted that the evil still continued; the grain was broken at the ends, and gave out a blue mould which rendered it totally unfit for malting. He had proposed, with others, to offer a prize of £50 for such improvements in the machines as should obviate this evil; nothing, however, had as yet been done in it, but he trusted that agricultural machinists would give attention to the subject, and that before long the difficulty would be overcome.

Mr. BUTT, in replying for the unsuccessful candidates, remarked that the difficulty of improving the machines so as to avoid breaking the grains of barley was very great; it had been accomplished, but at the expense of the straw, which was so injured that it could not be made into boltings. However, he had no doubt that in time it would be managed, and that Mr. Blizard's and the maltsters' cause of complaint would be remedied.

Mr. RICE, in response for the judges, said they felt surprise that the clay land had won the prize; but it was a fact that the sand barleys were burnt up last year, which of course accounted

for it. There had been 60 samples from Gloucestershire, Worcestershire, and Herefordshire sent in; and 10 from Berks and Wilts. In the course of their examination the samples of Mr. J. Creese and Mr. G. Woodward stood well for a long time, but at the conclusion they were bound to admit that those of the Rev. W. Parker for the former counties, and of Mr. W. H. Gillett, of Swindon, for the latter, were the best.

The CHAIRMAN in acknowledging a compliment paid to himself, said barley growing was a most uncertain operation for the farmer, for the plant itself was the most delicate of all the grains. He had in the course of his practice tried deep and shallow planting for it, and was satisfied that deep planting was wrong. Barley could not long sustain damp, and would at a depth of three inches turn yellow, and form new roots. Even in drilling, when the drill was held up on one side, and depressed on the other, the seed might be deposited three inches deep in one furrow, and only one inch in the other, and the effect would be visible all through the field, the shallow-planted seed being much more healthful and productive than the other. He had not been a successful competitor for the Cup, for his last year's barley had been too much in quantity to be of the highest quality, and no one could obtain both advantages at the same time.

Messrs. Blizard intend to offer a cup for competition for barley of this year's growth, which will be open to All England.—Abridged from the *Tewkesbury Record*.

HADLEIGH FARMERS' CLUB.—The annual meeting of this society came off on May 13. The exhibition of stock took place in a large meadow near Toppesfield Bridge, and presented as usual some splendid specimens of Suffolk horses. Sir C. S. Rowley, Bart., carried off the first prize for the best stallion for general agricultural purposes; Mr. M. R. Pocklington, for the best brood mare; Mr. R. C. Perry, for the best gelding; Mr. J. Vince, for the best ghaist mare; Mr. B. Allen, for the best colt under 27 months old; Mr. J. Partridge, for the best gelding for the general purposes of agriculture under 29 months; Mr. B. Allen, for the best filly ditto; Messrs. R. and J. Rand, for the best colt or gelding under 15 months, and for the best filly ditto; Mr. W. Strutt, for the best bull of any breed; Mr. T. White, for the best Suffolk cow; Mr. W. Strutt, for the best cow of any other breed; Mr. J. G. Stow, for the best fat steer or heifer; Mr. Walker Strutt, for the best shearing tup of any short-wool breed; Mr. Edward Cook, for the best ditto long-wool breed; Messrs. R. and J. Rand, for the best fine wether hoggett of any short-wool breed; Mr. J. G. Stow, for the best ewe hoggett ditto; Messrs. R. and J. Rand, for the best five wether and the best five hoggetta of long-wool breed, and for the best fleece of hoggett short wool; Mr. Edward Cook, for the best fleece of hoggett long wool; Sir C. Rowley, for the best boar; and Mr. J. Everett, for the best breeding sow. In the evening nearly ninety gentlemen dined together in the Town Hall, Sir C. Rowley presiding.

THE TREATMENT OF EWES.

WINFRITH FARMERS' CLUB.

The usual monthly meeting of the members of this club was held at the Black Bear Inn, Wool, on Wednesday evening, the 16th February last, Mr. T. H. Saunders having undertaken the introduction of the following subject:—"On the treatment of ewes during the time they are in lamb, and the cause of many having dead lambs." The chair was filled by Mr. Lillington.

Mr. SAUNDERS said: Mr. Chairman and Gentlemen,—As the members of this club, when choosing the subjects for our monthly discussions of this year, thought proper to place my name to the one on the card for this evening, I shall offer no apology for standing before you to state, to the best of my ability, a few of the leading points connected with the subject which have come within my own observation. But I feel myself very inadequate to do full justice to such an important subject, as it is one, in some respects, involved in great mystery—I mean with regard to many ewes having dead lambs: for although it is nearly 50 years ago that my father brought me up to be a shepherd within the bounds of this parish, and from my youth up until now I have been rather extensively engaged amongst sheep, yet am I still at a loss to account, in some respects, for their so doing. But I always feel that it is the duty of every member of this club, when called upon, to come forward and state to his brother members, to the best of his knowledge, the results of his experiences; and therefore, gentlemen, on these grounds I shall endeavour to lay before you, as briefly as I possibly can, some of the chief points relative to the subject for this evening's discussion. It is one which has particularly engaged my attention for many years; and, probably, you will better understand me if I state in what way I came in possession of some of those facts which I shall relate to you this evening. I think it is a very important subject to be discussed at a Farmers' Club, and one with which the flockmaster and shepherd cannot be too well acquainted. Of the value of purely physiological knowledge, as assisting the practical breeder, there can be no doubt, for in proportion as he is possessed of that knowledge so will the mortality in his flock decrease. I am of opinion that sheep breeders owe their success or non-success, in most cases, to their own peculiar management, that management being in accordance, or at variance with the

laws that govern nature, and the operations of the organs of reproduction during the middle and latter stages of the ewes' pregnancy. And I think every farmer who wishes to be a successful breeder ought to endeavour to make himself thoroughly acquainted with those laws, and let the management of his flock be in accordance therewith; then will he escape many of those heavy losses we often hear of during the lambing season, which some people say cannot be accounted for, and put down to "bad luck," from which assertion I very much differ. I do not believe it is mere chance or bad luck. You may depend on it, gentlemen, there must have been a predisposing and existing cause, for 10 or 15 per cent. of a flock of ewes to bring forth dead or unhealthy lambs, what some people term water-bellied, and that soon die. It is often existing in the ewe long before it is thought of by many, and at other times only a few days before it makes its appearance, according to the nature of the circumstances. This I will presently endeavour to explain to you, in the order in which I have found the different causes come to my knowledge; and I trust you will excuse me if I differ from many of you as to the production of some of those causes. I have before now met with many casualties, which people term bad luck, but I have for many years past come to the conclusion that it was not so, but that it was my mismanagement, although I was not aware of it at the time; and I have been for many years past able to account for every great loss which I sustained, though after it was too late for me to remedy it for that season. But I have found this cause of slip-lamb to which I allude, to have been produced in a very different way from what I have ever before heard it accounted for by any flockmaster; therefore I shall not hesitate to give you the result of my investigations. The one which I now particularly allude to is caused by too high keeping, which raises the blood too high; this I mean to explain in the latter part of my subject this evening. The causes of slip-lamb to me are now easy to account for in my own flock, but hard to remedy, unless I were always with the ewes myself. A ewe flock ought to be thoroughly well-watched in their treatment after they are nearly half gone with lamb. Another cause of slip-lamb is the ewes being chilled, or the lamb being chilled in the ewe from exposure to wet. And a third cause

is that the ewes are sometimes filled with too much gas from eating turnips, and the lambs are blown in their mothers. Therefore, I propose to treat under three different heads the subject with regard to ewes having dead lambs, as the causes are produced so very differently, and these are the only cases which have ever come to my knowledge during my experience. With these few observations, I will now proceed with my subject, in the order it stands on the card, which is "On the treatment of ewes during the time they are in lamb, and the cause of many having dead lambs." Now, in the first place, with regard to the treatment of ewes, we sheep breeding farmers in a general way half starve what we call our flock ewes during the summer months, to keep our sale sheep and lambs well; and the latter have the greatest part of all the good keep on our farms until the autumn, when the out-going stock is sold. The consequence is, our stock ewes are in very poor condition at the time the ram is put to them. By this system I am of opinion that many of us err. I don't think we get paid for half this extra keeping, if we sell them without being made fit for the butcher—I mean on farms where it is not convenient so to do without what I call starving our flock ewes to accomplish this object, as there is not difference enough made in price between a poor sheep and middling conditioned one to pay for half the extra keep which we rob our stock ewes of. Now, if we were to get into the system of selling our out-going stock early in the summer, then we should be enabled to keep our stock ewes well during the latter part of the summer, which would put them in a proper condition to breed a much better crop of lambs in the ensuing season, and be in a more forward condition for sale in the early part of the next summer, as I have before recommended. But here, gentlemen, I must leave this part of the system for your consideration, and proceed to point out to you the result which often happens, from having our flock ewes poor at the time the ram is put to them. With the general run of our down lands and stubbles, they seldom get in good condition before the lambs are large in them, unless they have a few turnips and a good supply of hay from the early part of October. This latter treatment, I am of opinion, brings the most healthy lambs, if you can get your ewes in sufficiently good condition to breed them and go through the winter well, and to leave the ewe in good order in the spring of the year. But this can seldom be done, unless you begin to keep them well before they are three-parts gone with lamb, after which you cannot make them hold their condition, as the lambs get large in them and take so much from the nature of the ewe, and as they have a great weight to carry

about, particularly when they have twins in them, and more so if they are driven far during the day, which practice ought to be avoided in all cases after they get heavy. Nor do I approve of their being kept too close, as ewes want sufficient room for exercise, and for other reasons which I shall presently state. There is very little grass or hay which grows in this district that has proof sufficient to keep a ewe in fair stock condition after she is three-parts gone with lamb; therefore I think, where it can be made available, all ewes after that time should be kept well with turnips or swedes and plenty of hay. But if you have not sufficient turnips to keep your whole flock at that time, I am of an opinion every flockmaster ought to run out from his flock, from time to time, such ewes as begin to get poor from breeding their lambs, and some will be so on account of having twins in them; all such as are of this class ought particularly to be kept well with swedes and hay. I do not believe, as some do, that turnips are injurious to forward ewes if properly managed and should you think they seem to get too low in condition when they begin to approach their time of lambing, I would say, give a few of this description a little corn until they have lambed, as all ewes will never do alike in any flock; then after they have lambed they will be able to breed their lambs, and go away with the best of the flock. But I think most of us do not pay a proper attention to this matter to be profitable to ourselves. Another thing is, farmers ought to contrive, as much as they possibly can, to provide a place for the sheep-keep to be in as sheltered a situation as possible for the breeding ewes during the winter months. As many of us have different aspects on the same farm in our hill country, a field should rise towards the south for a wet season, and towards the north for a frosty one, as sheep will always get to the highest land to lay down, if possible, which has great influence on our forward ewes, and often causes many of them to slip their lambs for want of their being removed to a sheltered place in bad weather, as I am satisfied that ewes are very susceptible to chills when they are in a forward state of pregnancy, where what we term dry sheep will thrive and do well. Therefore we ought, where we have hedges on bleak farms, to keep two sets of cribs for haying our forward ewes, that they may be removed to the shelter in a bad night of weather, and have their hay in such a place as they can stand to eat it, and then lay down comfortably, instead of being penned up in a close fold and bleak place, in a wet night, up to their knees in mud, either for the sake of saving the shepherd a little trouble on his part, or because his master will not go to a little expense to keep an extra set of hurdles or

cribs for this purpose, which is the cause of a full crop of lambs being often spoilt in a single night, as I shall presently prove to you. It is what I call losing the goose to save its feathers. I say that a good shepherd ought to watch for a rough night, and remove his forward ewes to some place of shelter, as a mariner would reef his sails at the coming of a storm to save his ship. Some people will say, "My sheep have not been folded in wet weather, but have been hayed loose in a stubble field, and could go to a sheltered fence if they chose; but they are now slipping their lambs, and I cannot account for it." Very true; but I say they will not go against the weather to the sheltered hedge, but will be driven away from their hay cribs, which, probably, are out in the middle of the field, and go before the wind and rain until they get to the top of the field, where they will be found in the morning in the most bleak corner as thick as they can stand, up to their knees in mud, after a very wet night. This is where the mischief is often done in a single night of such weather as we have had in the course of last week. Rather than they should be driven before the wind, as I have said, I would prefer their being in a fold of good size, as the hurdles would be some shelter to them, if made long one way and narrow the other, according to the wind. I have been now alluding to large fields of cold, strong land, not to small fields of dry, sandy land, which lie as level as a sheet of water. If sheep are hayed in the sheltered side of a level field they will remain there for the night, if not driven off by dogs, or something to frighten them away. But not so on our sideling hills, as they will seldom lie at the low side, but draw away to the most elevated parts; therefore if ewes are allowed to run loose, it should be in a field that rises towards the wind, and then they will be sure to lie in a sheltered part for the night, if driven in the evening. The same observation applies to a line of hurdles across a field when eating off turnips. If it rises towards the wind the sheep will be sure to follow the hurdles for shelter, and lie about one or two abreast, as far as the hurdles will shelter them; and provided that part of the field has been fed off for some time, and got consolidated from treading in dry weather, the water will run off in wet weather, and the ewes lie down comfortably for the night. By this mode of management, the ewes, when feeding off turnips, where they have plenty of room to lie back on the dried part, will go on and do well, and carry their lambs to their proper time in a wet season. It is this plenty-of-room system that I wish to call your particular attention to with regard to forward ewes. Another person may have a lot of

ewes in the next field fed on just the same kind of food—say turnips and hay, or any other kind,—but the elevation is of a different aspect, and the land fresh fed off, so that the ewes stand in the bleak side of the hurdles on their legs all night, in very wet and rough weather, until they are almost shivered to death, and the consequence is, they are chilled, and will cast their lambs before their proper time. Therefore, it is not the kind of food, but the weather, and the aspect in which the ewes are placed in bad nights, that often cause us such great losses. I have often heard a man say, "I have fed my ewes just the same this year as I did the last, but now they are slipping their lambs, and last year I had none." But they never say anything about the weather, &c. Let every well-thinking stockmaster, who has met with the misfortune of losing many lambs by premature birth, ask himself a few questions on this subject, and compare his notes with what I have here stated, and I think eight out of ten will agree with me on this point, for the same cause sometimes comes out in a different shape, although I am aware there is no rule without an exception. But before I depart from this part of my subject, I will relate to you how I know that the mischief is often caused in a single wet night, particularly when closely confined on the fresh fed turnip land. Many years ago I had between 600 and 700 ewes in a field eating off turnips for wheat, about the end of November. I ploughed up the land, which was eaten off close up to the hurdles, as I wanted to sow the wheat, and shut up the ewes rather close, on account of the weather appearing likely to be bad. I thought there were too many sheep to be in one fold, if it should be so, and as the turnips were nearly all fed off, I ordered my shepherd to turn out half the ewes into a grass field, which he did. The next night the weather came on very cold and sleety, and, not having much room, the next morning the ewes were in a very dirty condition, although it was very dry and light land on chalky subsoil, in rather a bleak situation. The result was that in a few days after, the ewes which were left in the turnip field began to slip their lambs. In a short time after, I removed them from the turnip field; but still they continued to cast their lambs, until about 100 had dead lambs, and many ewes died also; and to the best of my knowledge, scarcely a single ewe ever slipped her lamb which was only parted the day before the sleety night, and which was then on the grass land; and before that time there was not the least difference in their keeping. Therefore it convinced me the ewes were chilled in that one night; and never since that time have I allowed my forward ewes to be penned up in

a small piece of turnip land in so late a season of the year. I have now finished the part of my subject as to how ewes are so often caused to slip their lambs by wet and bad weather. I shall now proceed to point out how often they are caused to do so by very good keeping and fine dry weather, which, probably, will cause some of you to differ from me in opinion; but facts are stubborn things, and nothing will ever cause me to alter mine, after seeing so many proofs of this kind. I have said, in the former part of this subject, that we flock-masters often half starve what we term our flock ewes during the latter part of the summer; and in the autumn, after our sale sheep are sold, we sometimes have plenty of turnips to be fed off for wheat, when we begin to keep our flock ewes well with as many turnips as they can eat; and when we find we are getting late with our wheat sowing we are sometimes too liberal with our turnips, thinking we shall get our ewes in good condition to go through the winter well, as most of us like to see our sheep in high condition if we have an opportunity of getting them so; and on turnip farms many people put their ewes on to feed their winter turnips or swedes as soon as their wheat land is all fed off. By this time, where they have been given as many turnips as they could eat during a greater part of the autumn, they begin to get in too high condition to carry their lambs healthily to their proper time of birth. This more frequently occurs when ewes are kept on swedes, and allowed as many as they can eat, before they are three-parts gone: after that time it does not apply, as the lamb is too large in them. Therefore I say avoid giving plenty of swede until after that period. I have more frequently found my two-tooth ewes slip lamb from this mode of keeping, and I account for it in this way—they are often better in condition at starting than the other two ages of ewes, which have suckled lambs through the early part of the previous summer. And another reason is, some people push on their young age of ewes with better keep, on account of their youth, to get them in as good condition as possible, without a moment's consideration as to the laws of nature, or how the tender lamb in the ewe can stand so much what I term forcing. If ever you have your ewes in what you think extra good condition, that is the time when comes the great mischief. This most frequently occurs in a very fine dry autumn, when the sheep will "prove" double as fast as in a cold wet time, even if you were to double their keep, where we keep them on a folding system. I never remember to have had any losses from the cause which I have

been now pointing out in a wet cold autumn, as I could never raise the ewes' blood too high in that kind of weather. Gentlemen, I will now proceed to state to you in what way I mean the blood is raised too high in the ewe for the lamb to be carried healthily to its time of birth. By what I have been able to find out, the lamb is not so very attractive of its mother's blood until it gets towards half-gone, as I have never experienced any losses in this way previous to about that time, if I had forced a ewe ever so fast, as I have generally found a lot of ewes, almost fit for the butcher when put to ram, invariably carry their lambs well to their proper time. I account for it in this way—you cannot raise them much above the standard with the best of keep on a folding system without cake or corn; and unless you raise the blood too high just at the nick of time that the lamb is so attractive of its mother's blood, I am of opinion you have nothing to fear from the cause I am now representing, as I found my remarks upon notes of experience. I have known a lot of rather poor stock ewes, on more than one occasion, taken from a poorish farm and put with a lot of ewes, in what I call high stock order, on good land. They were all rammed together; and all kept on well during the autumn season, mostly to turnips, and at last swedes. They were never separated; and the poorer lot at the end of the autumn had got equal to the lot bred on better land. The consequence was that the lot of ewes which gained so very fast during the latter part of the autumn about half-slipped their lambs; and the lot which were in high order at first, and had been bred on the better land, scarcely slipped any. This was occasioned, no doubt, from their having made blood too fast at the time the lamb was so attractive of its mother's blood, and before the lamb was sufficiently large in the ewe to contain the quantity which flowed to it, while the other lot of better ewes had made a full flow of blood gradually, long before. Now I will explain to you in what way I have found this overflow of blood take place, and the symptoms by which it may be known. Many years ago I had some two-tooth ewes which got into high condition in November. They had been kept well to turnips for some time, and about the end of that month they were put on to as many swedes as they could eat, taking care never to overfill them. In about three weeks they began to look like a lot of fat sheep, and to cast their lambs. I immediately removed them from the swedes and put them to turnips again. I also examined one of the lambs immediately, as it came from the ewe. The cleaning came away with the lamb, and I saw

it was too large for a lamb not begun to wool—it was quite as large as it ought to be with a full-grown lamb up to its proper time; and the fleshy knots which were on it were swollen beyond their natural size; and also the navel of the lamb was much too large. From the general appearance it immediately occurred to my mind that the ewe's blood had been raised too high, as I also saw that a considerable quantity came from the one which had just slipped her lamb—more than ought to have been. I then went and got my shepherd, a man of considerable experience, who agreed in my opinion. I thereupon opened the lamb, as I saw it looked too large in the belly, and I found it to be full of loose blood: I think quite half a pint at least of just such as you would take from the veins of any animal, which fully corroborated my former opinion. Although I had taken them away from the swedes, I still had one or two cases almost every day for some time, and I still continued to open them, and found them about the same as the first I had opened—full of blood for a week or two, but after that the blood in the belly began to turn to a greenish kind of water. I still continued to examine the lambs in their different stages as slipped, until the ewes' time was out. By that time I had about 40 slipped out of 260. I then began to hope the dead lambs were all gone, but I was much disappointed, for many of the ewes which went to their full time brought dead or unhealthy, water-bellied lambs. Many of the ewes had twins; and sometimes one appeared to have been dead for days, and the other alive, but very weakly, and would soon die. Although some of the ewes carried their lambs to the full, I am perfectly satisfied the whole of the mischief was done at the same time—it was whilst at the swedes. Besides the loss of lambs a great many of the ewes had about double the proper quantity of water in them, of a nasty greenish unhealthy kind, the same description as the blood had turned to in the lambs which I had before opened. It caused these ewes which were so affected to get so poor that they had no milk to keep their lambs, and some died. I am fully satisfied this was produced from blood which had escaped from the valves in the womb, which contains the knobs which you see on the ewe's cleaning. This originated in the early part of the disease, when the blood was too high, as I had particularly noticed at the commencement the great quantity which flowed from the first ewes which cast their lambs. Having had one or two similar misfortunes within a few years previous, when I came to look back as to how I had kept my young age of ewes in those years, I found that every cir-

cumstance was exactly similar in keep, and that the ewes were in very high condition, which tended to corroborate in my mind every opinion which I had formed on the subject. I have found my two-tooth ewes more liable to the causes of which I have just been speaking than the other two ages; therefore I have abandoned the system of keeping my two-tooth ewes very high at that particular season ever since; and from that time until now I have not had anything to complain of, of that kind. I have had occasionally now and then a ewe or two slip their lambs from some cause which I could not discover, but that is what I term casualties—some from frights of dogs and trifling other causes which a farmer has no control over. I think the great secret is to know how to keep your sheep well enough to get them good, and not in too high condition to cause such great losses as I have been just describing. When I keep my ewes on a full feed of turnips, or anything else which is highly nutritious, and I find they seem to prove too fast about that particular time of which I have spoken, I now make a point to check them. I do not mean to say that I shall never again be caught in the same snare as heretofore, as I believe I have been very near it once or twice lately, and I find it a great difficulty to determine when to check them. Nothing but the master's eye will determine, as the shepherd who is with them so much can seldom see the difference in proper time, as I have often found them wrong in their opinion as to the proving of sheep. I once had a good shepherd who thought his sheep were doing well, when they had lost 9lbs. a sheep in a fortnight. There is one more cause for ewes having dead lambs, which I have not yet mentioned, and to which I must claim your attention for a few minutes. When the lambs get large in the ewes eating turnips, they sometimes are filled with too much gas, which often fills the lamb with wind, and causes its death near to lambing, more particularly so when the ewes have twins in them. In some seasons I do not find the turnips so gassy as in others; but when you find the ewes seem to blow much with turnips or swedes, they should be pulled up a week or fortnight before eaten; and it is a good plan for the forward ewes to be turned back when you think they have eaten sufficient, and be shut out of the fresh pitch for an hour or two before they are let in again. These three causes on which I have spoken are the whole that have come to my knowledge during my experience, and by which I have been several times affected. I have spoken on this subject at greater length than I intended when I began,

and I have done so with the view of stating to you my reasons for the assertions which I have made. I am aware that I have not done full justice to this subject, as it would fill a volume properly to represent the words on the card for this evening's discussion; but I trust I have said sufficient to convey to you some of my ideas on the subject. I have done my best to point to you in what latitude the rocks lie whereon I have been severally cast away; and I recommend such of you gentlemen as are here this evening, who wish to avoid my misfortune, to go home and lay down in your own charts where they are to be found, that you may not share the same fate. Now I have given to you, gentlemen, fairly and freely the results of my experience, and I hope many of you will favour me with yours; and I am ready to answer any questions which you wish to put to me on this matter.

Mr. FOWLER asked what hay the young sheep had that slipped their lambs?

Mr. SAUNDERS: Clover hay—broad clover, and rye-grass.

The CHAIRMAN spoke of an instance in which about four years ago he sustained great loss by a single night's bad weather while the ewes were in a field of swedes when nearly half gone. He only got three out of the first hundred, and could scarcely conceive the cause, but he believed that Mr. Saunders was about "half right."

Mr. FOWLER said that a few days ago he happened to take up a work by the Rev. Mr. Berkeley on the diseases of plants and their effects on animated nature. The author mentioned a disease peculiar to cereal crops, which took the shape of fungi, scarcely to be observed by the human eye, and which possessed the properties of the drug called ergot. It was generally known that this drug had the effect of expelling the fœtus before it came to maturity; and as Mr. Berkeley enumerated rye-grass as among the plants subject to this disease, it was a question whether the loss of lambs, in some instances, might not be traced to the ewes eating provender so diseased. He believed this was the cause of his losing a number of lambs some few years ago.

Mr. CLARKE accounted for the loss of a few lambs by allowing the ewes to eat frosted mangold leaves.

Mr. BUDDEN said they had been keeping some on mangold leaves, not giving too much at a time, and they had done very well.

Mr. CLARKE stated that the ewes he spoke of did not have any turnips, but were fed on mangold and meadow hay, and they did very well until they got

some frosted mangold leaves. He attributed it to the leaves becoming decayed, and having an injurious effect on the ewes.

Mr. WHITE was of opinion that when the ewes were in tolerably good condition, about a fortnight or three weeks before lambing commenced, they should have half an allowance of turnips or swedes, and plenty of hay—that they should be allowed to go back a little rather than forward. His shepherd had taken five prizes from the Wareham Agricultural Society, in thirteen years, for lamb rearing; but one year he had very bad luck, which he could not account for at all, as he kept the ewes just the same as he usually had done. On that occasion he had about 200 slip lambs, but generally his loss did not exceed ten or twelve. He thought they might have more lambs if the ewes were well kept before the commencement of the breeding season. He thought there was a good deal in what Mr. Saunders said with respect to the keeping of the two-tooth ewes.

Mr. SAUNDERS asked if Mr. White did not once sell a lot of ewes which were unfortunate in lambing.

Mr. WHITE replied that he did, and a great many of them slipped their lambs, although those they were put with did not, and the whole were put to the ram at the same time.

Mr. SAUNDERS attributed it to Mr. White's ewes proving much faster than the others, in consequence of being put on a fresh piece of land.

Mr. JACKSON said he had not had much experience in this unfortunate lamb-slipping. He did not know whether it was owing to the locality from which he came, but the few cases that did occur were traced to the ewes being worried by a dog, or such like casualty. He did not know whether Mr. Saunders considered it infectious, but it was generally considered so in his country, and they always removed such sheep away from the flock. He thought many ewes were "killed by kindness" at the time they were lambing—that was, by keeping them too warm in pens and yards too liberally littered. At Rempstone they had lost a number of ewes by having them in the yard; but when they had them out in a place hurdled round, so that they could be shifted, they scarcely lost any.

Mr. WHITE said he had always been in the habit of having his in a yard, and well littered, and he did not lose many. He did not think that had much to do with it.

Mr. CLARKE was an advocate for the yard. There was not over sheltered or too warm, and they kept bedding it up, so as to render it dry and

healthy. The cribs were placed round the sides, so that the sheep could not jump over them, which often was the cause of mischief. The remarks made by Mr. Fowler deserved attention; and he thought there was nothing like good up-land hay for ewes when breeding. On the whole, he considered there were so many changes in the climate and the constitutions of the animals, that it was difficult to account for the bad luck often experienced.

Mr. FOWLER thought they would not be wandering from the subject if they took into consideration the treatment of ewes with the wethers out and in premature lambing. In the former case he had been recommended to use an ounce and a half of belladonna mixed with a pint and a half of boiling water, and allowed to stand till it got cold. He first washed with warm water, and then applied a small portion of the solution. In the latter case he used equal portions of opium and nitrate spirits of ether, and if there were any uneasiness he gave a dose of four tea-spoonfuls.

Mr. LONGMAN stated that he had been unfortunate with his two-tooth ewes, but he could not tell the reason, as they had been feeding with the others.

Mr. FOWLER thought there might be a predisposition in many young ewes to cast their lambs, and that they were more subject to inflammation, &c., than the old ewes, which would account for the greater number of casualties among the two-tooth ewes.

Mr. READER considered that lambing in a yard depended a great deal on the situation. If they had a yard, it ought to be in rather a higher place than if they were going to let the ewes lie open, so that there might be plenty of air. In a low yard they would get a damp atmosphere, and have inflammation among the sheep. He could scarcely reconcile what Mr. Saunders said respecting the two-tooth ewes and the old ones. It was known that the ewes sent to Weyhill fair from the lower part of Dorset and Somersetshire were in the highest condition, generally fat enough for the butcher; and the purchasers must calculate upon good luck, or they would never give the prices they do. It often happens that the dam and lamb were sent to Smithfield together, and the ewes must be kept in good condition, otherwise they would not be fit.

Mr. SAUNDERS said he had heard of parties buying at Weyhill, and having bad luck, which he considered to be owing to the ewes being in too high condition.

Mr. ALNER stated that a friend of his had been

unfortunate with his two-tooth ewes, though they were not in such good condition as the other portion of the flock.

Mr. SAUNDERS, in replying to different questions, said he had given his ewes all sorts of hay, but did not know that his ewes had suffered from any that was diseased in the manner Mr. Fowler had spoken of. As to ewes suffering from the wether being out, he generally applied hog's lard, or, in a bad case, hog's lard and tar, tying string across without putting in a stitch. He thought it was a question whether it were the frosted mangold or a bad night which caused the injury Mr. Clarke had alluded to. Mr. White likes his ewes to go back a little before lambing, but he (Mr. Saunders) thought it was impossible to keep them up enough at that period. He agreed with Mr. Jackson that lamb-slipping was infectious, although he could not speak with certainty, but he always guarded against it. He thought a yard in general was bad. If they kept the yard thoroughly well littered and dry, they might keep the ewes healthy; but if they got it wet and mucky it was very bad, and he had lost lambs after a wet night in such cases. He used an open fold with hurdles which he could shift every day; and after the ewes had lambed, he put them in a place where there were sheds to protect them. He did not object to putting the cribs round the fold or yard where they had plenty of room, in which case it was a very good plan. What Mr. Longman stated corroborated his observations with respect to the two-tooth ewes, and he attributed the loss to their being in too high condition. As to Mr. Alner's remark, of course there were exceptions to every rule. He generally used Driffield's Black Oil in cases of inflammation, but thought it was a question whether it was that or nature itself which effected the cure.

The following resolution was then come to:—
 "That the ewes should be kept during the winter months in as dry and sheltered a situation as the farm will admit of; that they should not be allowed to remain on the turnip land (especially if strong, wet soil) during the night, after heavy rains; that care should be taken not to drive them any great distance to heat them: and that turnips are considered by many to be beneficial if given moderately."

The CHAIRMAN then complimented Mr. Saunders on the able manner in which he had introduced the subject, and proposed a vote of thanks to him.

Mr. WHITE seconded the proposition, which was unanimously agreed to, and the proceedings terminated.—Dorset County Chronicle.

THE ENGLISH FARMER IN BELGIUM.

SIR,—In continuation of an account of those Flemish crops, the most worthy of trial on the "little field," I suppose to be set apart for it, I will commence this letter with the "*Yellow Lupin*." Wherever I have yet been, in France or Belgium, I find a greater admixture of sand in the soils than in England. In many parts of Belgium it is a perfect sand; so much so as even to be easily moved by the wind; and a most ingenious way they have of "fixing" it (but of this and other Belgian contrivances in some future letter). In Germany there are whole districts of the very poorest sands. For some few years past on these soils the agriculturists, or rather proprietors on these miserable lands, have been much impressed with the immense advantages to be derived from the "*Yellow Lupin*" as a green crop to be ploughed in. It is so effective that where it has been followed up, as in Pomerania, Saxony, and Brandenburg, those estates, which before were worthless, now produce splendid crops of rye and lupins, without any manure being employed but that which arises from these crops.

It is not a high-growing plant, but very leafy, and branches much, consequently it may be drilled thinly at eighteen inches, and hoed or not, as you please. It is a sort of bean with a spotted skin, sown in the spring at the rate of two bushels per acre, and ploughed in when in full flower. The ground may be then sown again with it, and that crop also buried. I should say after the first frost; but in Germany they sow it after harvest, and turn it down in the spring for rye or oats, and have thus obtained a white crop and this "manure" crop for three or four years together on the same land!

If it would stand our winters, it is just what we want to occupy our stubbles from harvest to February; and is well worth trying. We have many sandy districts in Norfolk, Surrey, and other parts, where I cannot see why it should not have the same effects as abroad in north of Germany. There are many gentlemen there grow as many as 120 to 200 acres of this plant annually, as the farms run large. They grow it for corn, and also occasionally cut it for hay. The grain ripens in August; but it is difficult to harvest, because the plant itself is so succulent, and the pods do not all ripen at the same time. It is mown in swaths, and after laying a few days, is set up in single sheaves, as we do sometimes our beans, with a bean-stalk twisted round near the top of the sheaf, the lower part standing out like an umbrella. Another difficulty is, the pods are so liable to open, and shed the grain. But there are ways to meet all this. One man made small stacks of it, with alternate layers of oat-straw; it heated a little, gave the oat-straw a flavour, and dried itself without injuring the grain.

It might be made into long stacks of only two sheaves in width, and the height of long poles set in the ground on each side, at intervals of a dozen yards, to keep them up. I have seen this done with the

cammeline oil plant; but I cannot see why the French plan of round shocks of a dozen sheaves with three-hood sheaves should not answer, and so let them remain out some weeks, till thereby dry, and then carted home in waggons, with old tilts at the bottom to catch the shed lupins. This excellent mode of shocking corn I have described in a former letter to your paper.

Another man had it half-thrashed in the field, lads going round and giving each sheaf half-a-dozen knocks with a stick, and shocking them. This is a good plan, as the pods dry so long before the juicy stalks.

The feeding property of the grain is about the same as common beans.

It likes *deep cultivation*. The land is never "sick" of it, and where grown annually as manure, for some six or seven years, it has turned the soil a dark colour, from the quantity of decayed matter deposited.

If mown for hay, in full flower, it is considered quite as nutritive as clover; but I should doubt that. It should always be mixed in the (long) stack with layers of straw. April would be the time for sowing it, and thicker than if intended to produce grain. It has grown two tons of hay per acre. It is good for all animals; but cows must not be allowed too much of it, or it will give a taste to the milk. On soils that suit it (and any will do so except chalk) it will grow a yard high, deeply ploughed and subsoiled.

If sown to be folded off by sheep, tares must be mixed with it, and they will then readily eat it; but not so well if sown alone.

In using the grain for food, fattening bullocks should have not more than half a peck per day, young lambs three quarters of a pint, cows two pounds, and horses one-sixth of their usual quantity of other corn mixed with it. The lupins should be first wetted twenty-four hours in water.

The above is sufficient to give an idea of its cultivation and use. But I should think its greatest value to us would be as a green crop, to be sown after harvest on *all soils*, and ploughed in as manure; or on our poorest lands, as a means of making them worth cultivation, and which are now almost worthless. For this purpose the first two years it should be sown twice a-year; after which, the four crops having been turned in the soil, we might expect it to be in a sufficiently productive state to be cultivated in that course the owner may think the best. Perhaps that would be to lay it down for sheep-feeding, as it is stated a small farmer in the village of Dusenau, having for some few years ploughed in his lupins in full flower in the spring, and then sowed rye, he found the field began to be covered with a wild white clover—it was a white sand, and had been turned quite dark from the quantity of humus left in the soil.

"*Spergule*" is a small plant sown on the stubbles for fodder late in autumn; and very frequently ploughed in

as manure. It is sown thickly, as it does not grow above a foot high. It is worthy of trial for this purpose by the side of the yellow lupin.

"*Cellette*" is a poppy, producing the next finest quality of oil we have to olive. There are two sorts, one with a black seed, and the other grey. The latter crop the best, but the heads open when ripe, and is lost from those which recline. It is sown in rows in March or April 10 pints to the acre, at 18 inch intervals, and hoed out to 8 or 10 inches in the rows. In harvest they are kept upright, tied in sheaves, and shocked like corn, and when dry are thrashed in the field, on a movable small wood floor, like our old cloverseed floors. The produce on an average is about 16 bushels of seed to the acre, which give one-third of oil. The quantity of straw, which is useful as litter, would be about 14 or 15 cwt. It was a crop which paid the Flemish farmer well last year. Its advantages are—its admitting of so many hoeings, coming off the land early, and being a change to the soil.

"*Cammeline*" is another dwarfish growing oil plant, which is very useful to them, because it admits of being sown as late as May; and is a resource to be put in

where other crops have perhaps missed plant. It is very hardy, and sown broadcast 6 pints to the acre. It is harvested as soon as the heads turn yellow. Product about 18 bushels per acre of seed, which yields about one-fourth in oil. The cake is only fit for manure, but the straw is used for litter. This also was a profitable crop last year.

As the crops here described are suitable for poor and sandy soils, I will in my next give some details of the growth and manufacture of another plant, the *Jerusalem artichoke*, which has been, and is, grown in France on comparatively a large scale for distillation and cattle-feeding. It is the root which, had the potato disease continued, would certainly have been much cultivated in England, as that edible is the most adaptable to take its place. It will grow on the poorest soils, and with the least cultivation, giving a tolerably heavy produce of any other root. I do not know of any one having grown it to the same extent in England. I hope it may interest your readers.

Yours truly,

W. HARTLEY.

Poste Restante, Brussels, April 13, 1859.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A MONTHLY COUNCIL was held on Wednesday, May 4th. Present: His Grace the Duke of Marlborough, President, in the Chair; Earl of Lovelace, Lord Southampton, Lord Walsingham, Lord Bridport, Lord Feversham, Lord Leigh, Lord Tredegar; the Hon. W. G. Cavendish, M.P.; the Hon. A. Leslie Melville; Sir John V. Shelley, Bart., M.P.; Mr. Raymond Barker; Mr. Barnett; Mr. Brandreth; Mr. Briscoe, M.P.; Mr. Caldwell; Colonel Challoner; Mr. Exall; Mr. Brandreth Gibbs; Mr. Fisher Hobbs; Mr. Wren Hoskyns; Mr. James Howard; Mr. Hudson (of Castleacre); Mr. Jonas; Mr. Lawes; Mr. Lawrence; Mr. Milward; Mr. Pain; Mr. Pope; Prof. Simonds; Mr. Torr; Mr. George Turner; Prof. Voelcker; Mr. Jonas Webb; and Mr. Wilson (of Stowlangtoft).

The following new members were elected:

Baroby, Miss Elizabeth, Dishforth, Thirk.
Bleerton, R. W. Mountfort, Field Hall, Cheadle.
Booth, John B., Killerby, Catterick.
Byers, Stephen, Chambers Farm, Epping.
Carter, Samuel, Battle.
Chawner, Capt. Edwd., Manor House, Sutton Valence, Alton.
Clinch, Charles, Witney.
Corfield, William, Buttersby Hayes, Audlem.
Cox, Captain Charles James, Fordwick House, Canterbury.
Creswell, Gerard Oswald, Ashwicken, Kings Lynn.
Dawes, Samuel, Smeethwick House, Birmingham.
Donald, W., Regent-street, London.
Eley, W. Henry, jun., Cobham, Kent.
Fraser, Hugh, Culladen, N. B.
Gower, Andrew, Market Drayton.
Harker, Rev. Wm., The Vicarage, Pultexhill, Amphthil.
Haward, Joseph, Reddish, Stockport.
Henderson, John, Felderland, Sandwich.
Henton, Samuel, Bridge-street, Lambeth.

Hopper, Wm. Cuthbert, Beaumont, Doncaster.
Horner, Thomas, jun., Moreton-in-the-Marsh.
Hudson, Thomas, Adderley, Market Drayton.
King, Edward James, Beekenhill, Warwickshire.
Jaggard, Joseph, Leek Wootton, Warwick.
Lacey, William Charles, Bestwell House, Wareham.
Lowe, Edward, Comberford Mill, Tamworth.
Midworth, John, Newark-on-Trent.
Morgan, John, Green Lanes, Birmingham.
Moorell, Jas. Conyers, Leyland, Lancashire.
Neville, John, Haeol Hill, Lichfield.
Newell, Wm. Atkinson, Netherside, Skipton.
Nicks, John, Leek Wootton, Warwick.
Nott, James, Little Frome, Bromyard.
Pilgrim, Samuel C., Manor House, Burbage, Hinckley.
Powell, Richard, Benson, Wallingford.
Satchvell, Thomas, Knowle, Birmingham.
Sills, William, Casthorpe, Grantham.
Sinclair, John, Glenwraqubach, Inverness.
Smith, Joseph, Henley-in-Arden.
Snow, Rev. George Doyley, Newton Valence Rectory, Alton.
Spain, George, Hacklinge, Sandwich.
Stanford, Wm., jun., Steyning Court Farm, Steyning.
Stanier, John G. Uppington, Wellington, Salop.
Stubbs, John, Weston Hall, Stafford.
Wenman, Wm. Henry Weston, Shiffnall.

FINANCES.—Mr. Raymond Barker, chairman of the Finance Committee, presented the report on the accounts of the Society, by which it appeared that the current cash balance in the hands of the bankers was £1,583 1s. 8d.

COUNTRY MEETING OF 1860.—The report of the Inspection Committee having been read and deputations received from Canterbury, Croydon, Guildford, and Reigate, the Council decided that the Country Meeting in 1860 should be held at Canterbury, on condition that the Mayor of that city entered into the usual agreement with the Secretary of the Society by the next Monthly

Council on the 1st of June. These deputations consisted of the following members :—

Croydon Deputation.—Thomas Bryou, Esq., President of the East Surrey Agricultural Society; Thomas Kem, Esq.; Richard Northey, Esq.; John Wm. Sutherland, Esq.; The Rev. E. F. Brynon; Wm. Goldsmith, Esq.; Thomas Farley, Esq.; Wm. Castledine, Esq.; Mr. John Wood.—H. Richards, Hon. Sec.

Canterbury Deputation.—Lord Sondes; Sir Walter James, Bart.; Sir Norton Knatchbull, Bart.; William Deedes, Esq., M.P.; Sir Brook W. Bridges, Bart., M.P.; Hon. B. Johnston, M.P.; E. H. Knatchbull Hugeson, M.P.; the Mayor of Canterbury; the ex-Mayor of Canterbury; Major Munn; S. M. Hilton, Esq.; Robert Lake, Esq.; Thomas Cooper, Esq.; Thomas Philpott.

Reigate Deputation.—J. C. Sherrard, of Kinnersley; J. G. Marriage, Nutfield; F. Mellersh, Reigate; C. Goldsmith, ditto; J. Lees, ditto; C. W. Eborall, Manager of South Eastern Railway.

Guildford Deputation.—Earl of Lovelace (Lord Lieutenant of Surrey), Mr. Drummond, M.P., Mr. H. Currie, Mr. Cousmaker, Mr. Elkins, Mr. Finney, Mr. Smallpiece, Mr. Scott.

AGRICULTURAL CHEMISTRY.—Mr. Wren Hoskyns, Chairman of the Chemical Committee, presented the report recommending that the wording of the rule regulating the members' privilege of analysis be altered so as to meet the intention of the Council, viz, so as to exclude all but analyses "required for the *bonâ fide* personal use of farmers." The following subjects of investigation by the Society's Consulting Chemist were recommended :

1. The changes that take place in liquid manure in passing through different soils.
2. Experiments on top-dressings for Wheat and Barley.
3. The continuation of his experiments on the nature and physiology of cultivated Turnips.
4. The different modes of applying manure in autumn and in spring.

HOUSE COMMITTEE.—Mr. Raymond Barker, Chairman of the House Committee, presented the report as to the repairs required in the drainage of the house.

WARWICK MEETING.—Lord Leigh, Vice-Chairman of the General Warwick Committee, reported the following recommendation of the Committee—

1. That Mr. Bishop, of the Regent Hotel, Leamington, should supply the first-class refreshments for the public in the show-yard; and that Mr. Cole, of the Horse and Hounds Inn, Warwick, should supply the second-class refreshments, subject to arrangements with the honorary Director of the Show.
2. That the date of entry for cheese, wool, and farm gates (being local prizes), be extended to the 1st of June, in compliance with the request of the local committee at Warwick.

The Committee further reported the arrangements that had been made for the supply of green fodder for the live stock, and the commencement of the show yard by the Society's contractor.

STEWARD OF IMPLEMENTS.—On the motion of Mr. Torr, seconded by Mr. John Hudson (of Castleacre), Mr. Edward Pope was elected one of the Stewards of Implements, in the place of Lieut. Colonel Towneley, who had conveyed to the Council his regret that he would not be able to act in consequence of absence from England.

STEWARD OF LIVE STOCK.—On the motion of Mr. Brandreth Gibbs, seconded by Mr. George Turner, Mr. Fisher Hobbs was elected to that office.

COUNTRY MEETING OF 1861.—On the motion of Mr. Brandreth Gibbs, a communication from the Secretary of the Crystal Palace, inquiring relative to the Society's proposed Metropolitan Meeting in the year 1861, was referred to the "Metropolitan Sites Committee."

HOUSE LIST.—Agreeably with the Bye-laws, the Council arranged by ballot an election list, to be recommended by them for adoption at the ensuing General Meeting.

The Council then adjourned to its Weekly Meeting on the 11th May.

A WEEKLY COUNCIL was held on May 11, the Right Hon. Lord BERNERS, Trustee, in the Chair.

A communication was read from Mr. Edward Farmer, "On the Preservation of Mangel Wurzel Roots." He transmitted a root grown and stored with the crop of 1857, and subsequently with that grown in 1858. On the root being cut, it appeared quite sound excepting where it had been bruised on the outside.

A communication was read from the Consul-General of Sweden and Norway, stating that he was requested by Professor Holst, of the University of Christiana, manager of the Royal Farm in Norway, to forward to the Society copies of the first series of reports on the proceedings of the Royal Farm.

The thanks of the Council were ordered for the above communications.

Adjourned to May 18.

A Weekly Council was held on Wednesday, the 18th of May, Colonel Challoner in the chair: present, the Hon. Leslie Melville, and Messrs. T. Raymond Barker, B. T. Brandreth Gibbs, W. Fisher Hobbs, Samuel Jonas, A. Majendie, P. Simpson, T. Scott, and T. B. Western.

The names of candidates proposed for election were read.

The Secretary of the Belgian Legation transmitted copies of the programme of the International Exhibition of Reaping Machines, to be held at Brussels, under the auspices of the Central Agricultural Society of Belgium.

The Hon. Leslie Melville laid before the Council copies of the prospectus of a gas apparatus adapted to lighting farm-buildings and stables, and private houses. Having had one in operation himself for a year, he was enabled, from personal observation, to detail its success. He stated that an intelligent labourer could manage it, and that the cost of gas varied from 2s. 9½d. to 3s. 6d. per 1,000 feet, but of course subject to variation according to the price of the coal used.

Mr. Fisher Hobbs expressed his willingness to detail to the Council the result of his practical experience relative to the turnip fly, and his success in lessening the ravages made by it. The Council expressed their hope that Mr. Fisher Hobbs would favour the Society with this statement at the Weekly Council to be held on Wednesday, the 25th May.

Adjourned to Weekly Council on 25th May.

The half-yearly general meeting of the Society was held Monday, May 23, in Hanover-square. The chair was taken at noon by his Grace the Duke of Marlborough, President for the year. Among those present were Earl Powis, Colonel Challoner, Messrs. Raymond Barker, Milward, Fisher Hobbs, B. Gibbs, Burch Western, T. Crisp, H. Corbet, S. Sidney, Beale Browne, T. Pain, T. Scott, Barnett (Stratton), Clutton (Notts), James Howard, Johnson, V. Simpson, S. M. Hilton, and G. Rochfort Clarke.

In the absence of Mr. Hudson, in consequence of indisposition, Mr. Brandreth Gibbs officiated as secretary *pro tem*.

The order of the proceedings, and the powers invested in the meeting, having been read,

Mr. R. MILWARD moved the election of the President for the year ensuing the Warwick Meeting. He said he gave notice to the Council of his intention to propose Lord Feversham, having inferred from a conversation which he had with him that his Lordship would accept this office. But at the last meeting of the Council his Lordship said he feared that he would not be able to devote the requisite amount of time to the duties, and that he hoped, therefore, the Council would select some other gentleman; adding that he thought Lord Walsingham, who was sitting near him, would make a very good president. Lord Walsingham, on being appealed to, said that if he were elected, he would do his best to promote the interests of the Society; and he (Mr. Milward) had very great pleasure in now proposing that his Lordship should be the President for the next year.

Col. CHALLONER felt very great pleasure in seconding the nomination, knowing that Lord Walsingham farmed in Norfolk, and took great interest in the proceedings of the Society.

The motion was carried unanimously.

On the motion of Col. Challoner, seconded by Mr. T. B. Western, the Trustees were re-elected.

Mr. W. F. HOBBS, in moving the re-election of the Vice-Presidents, paid a tribute for the services which many of them had rendered to the Society.

The motion, after being seconded by Mr. R. Milward, was carried unanimously.

Mr. B. GIBBS then read the report of the Council, which was as follows:—

REPORT.

The Society consists at the present time of—

78 Life Governors,
130 Annual Governors,
927 Life Members,
4,008 Annual Members,
18 Honorary Members,

Making a total of 5,161 names on the list.

The Council has elected Lord Leigh, of Stoneleigh Abbey, a member of the Council, to supply the vacancy caused by the resignation of Sir Archibald K. Macdonald, Bart.

The funded capital of the Society stands at £10,000 Stock, in the New Three per Cents.

The Council has appointed Professor Spooner, of the Royal Veterinary College, joint Veterinary Inspector with Professor Simonds, at the Annual Country Meet-

ings of the Society. This step has been found necessary in order that every facility may be afforded for a thorough examination of the animals sent to the shows, more especially as to their freedom from any hereditary diseases, which might be transmitted to their progeny; and also as to whether the state of dentition fully bears out the ages stated in the certificates.

The Council has decided that Professor Voelcker, the Society's consulting chemist, shall investigate the following subjects:—

- 1st—The changes that take place in liquid manures, in passing through different soils.
- 2nd—Experiments on top-dressing of wheat and barley.
- 3rd—The different modes of applying manure in autumn and spring.
- 4th—The nature and physiology of cultivated turnips, being a continuation of his experiments connected with this subject.

The Council has determined to amend the wording of the rule regulating the Members' privilege of analyses, so as to prevent dealers or manufacturers of manures availing themselves of the reduced scale of charges, which has been secured for the benefit of such Members as may require these analyses *bonâ fide* for their own personal use as agriculturists.

The Warwick Meeting (to be held in the week commencing Monday, July 11th) promises to be of a highly interesting character. The arrangements for the Meeting are steadily progressing. The entries for implements are so extremely large as to require six sheds to be added to last year's plan, in the implement department alone; and the applications for space in the yard devoted to "machinery at work" are also far greater than on any former occasion.

The entries for live stock will, as usual, be received up to the 1st of June. The numerous applications for certificate-forms that are being received daily indicate that this portion of the Show will at least be equal to any former exhibition.

The Local Committee at Warwick having declined to undertake the arrangements and expenses connected with the dinner during the Society's Meeting, the Council has determined to adhere to the resolution of last year—not to take these responsibilities on itself on the present occasion.

The special attention of the General Warwick Committee has been directed to the subject of the supply of refreshments for visitors, in the show-yard, during the exhibition; and such arrangements have already been made, and are still in progress, as, it is hoped, will secure to the public due accommodation in this respect, at a fixed tariff of charges.

Since the Society first prominently drew attention to the important subject of the application of steam-power to the cultivation of the soil, by offering a special prize of large amount, several inventions and improvements have been brought before the public; and the advancement made was such as to lead the Council to award the prize of £500 at the Chester Meeting, last year. As, no doubt, further improvements have since been made, it may be confidently expected that the trials to be carried on at Warwick, under the direction of the Society's Judges, will prove an interesting feature in the meeting, by affording agriculturists an opportunity of personally inspecting the different inventions that will then be brought together in competition.

The Council has decided that the Country Meeting of next year, for the South-eastern district (comprising the counties of Kent and Surrey), shall be held at the City of Canterbury. The accommodation offered and guaranteed by the authorities promises to be unusually convenient and complete.

The Council has the satisfaction of recording that the

great gratification to him in the retrospect of his past life (cheers). He thought the year which was opening upon them was full of promise. The place which the Council had selected for the next annual show was one which was calculated to excite a very large amount of interest, and to afford accommodation to a very large number of persons; and as regarded the selection of Canterbury for next year, if the blessings of peace were preserved to this country, as he trusted in God's mercy they would be, there would no doubt be a considerable number of foreigners attracted by conve-

nience of situation to the show, to witness the progress which was being made by English agriculture. He believed that Canterbury was almost unanimously selected by the Council, and he was confident that the result would be satisfactory. He congratulated the meeting that the gentleman who was to succeed him in the office of President possessed an advantage which he (the Duke of Marlborough) did not, in his practical acquaintance with agriculture, and he was sure no more fitting selection could possibly have been made.

The meeting then separated.

CALENDAR OF AGRICULTURE.

Sow turnips during the whole month, as the land is got ready. Swedish turnips are finished by the 10th. The drop-drill sows all auxiliary manures on the ridglets formed by the common plough: a light roll covers the work, and protects the surface from drought. Plough pared and burned lands with a light furrow; harrow the surface into a fine tilth; and sow the seeds towards the end of the month. On clay lands, sow on the finely-harrowed surface of one ploughing; if the soil be loamy, reduce the land and drill it, which will well mix the ashes with the soil. Sow rape and coleseed for winter food. Plough lands, after tares have been consumed on the ground; harrow the surface into a fine tilth; and sow the turnip-seeds in rows, by means of a machine with long coulter, to make ruts in the ground. Sow-in, broadcast, the headlands of the turnip-fields, and use short dung, as it is easily covered.

Horse and hand-harrow beetroot, carrots, and parsnips; and allow not one single weed to be seen.

If the potato drills were not rolled after being planted, they may now be harrowed. Plough deeply the intervals of the drills; keep the scufflers and hand-hoes constantly going; break all clods; and pulverize the soil very deeply and freely. Fine earths are essential to all root-crops.

Continue the feeding, in the yards, of cows and

horses with clovers and vetches; feed amply; provide abundant littering; and convey the liquid to the tank.

Cut all tall weeds from among the grain crops. Allow not any weeds to perfect seeds on pastures, by fences, or on roadsides. Many seeds are winged, and are carried by the wind to a distance, and propagate very rapidly.

Finish the shearing of sheep this month. Examine the animals closely at this time in the month. Shape the quality of the wool, and in the general appearance. An inspection of the animals at this time, and making distinctive marks, will very much assist the sorting of the ewes for the tugging season in October.

Put mares to the stallions every fortnight. Wean lambs by placing them at once beyond the bleating of the ewes, and give them the best grass on the farm.

Hay-cutting will commence this month. Ted the swathes quickly behind the mowers; cock the grass; spread it abroad, and cock it again, and carry to the rick. Employ plenty of hands—about six to a mower. Turn over clovers in the swathe without tedding, as much shaking loses the leaves, which are the best part of the plant. Build it into large cocks, which may stand for a time. Damage by rain is much recovered by mixing salt in the ricks—30lbs. to a load.

CALENDAR OF GARDENING.

First week—Sow early peas, of sorts, with a few rows of "tall marrow." Peas late sown seldom escape mildew. Sow kidney beans and runners for succession. Plant cabbages, as Atkin's Matchless, to come in speedily. Sow Dutch turnips for autumn; carrots and onions, to draw young, or stand the winter.

Fourth week—Sow again turnips, salads, and lettuces.

Transplant Cape broccoli about the middle of the month; cauliflower for August, making the ground rich with compost; also transplant borecole, Scotch kale, Savoy, and Brussels sprouts.

Asparagus beds still yield, but should not be cut

beyond the 10th. Beds and rows are mangled by too close cutting. A shoot must always remain untouched to each crown. Scatter rich earth, with droppings, over the beds, but avoid salt, which, falling on wet leaves, decomposes the tissue, and the plant dies. Mix the salt with compost, and thus wash it into the ground.

Plant young thyme, savory, sweet marjoram, basil, slips of lavender, rosemary, rue, and other hardy sweet-herbs, in cool, shady beds, for subsequent transplantation.

Cut the aromatic herbs for drying, when the flowers begin to appear.

Thin out onions by degrees for use, leaving the bulbing stock from four to six inches asunder. In very dry weather frequent light hoeings prevent the cracking of the surface, attract moisture, and bring on the plants—a practice that has been fully proved in the benefit.

Apple and pear espalier trees will have produced many young shoots, of which the ill-placed must be removed from the bottom: a total removal is better than shortening. Strawberry rows should be strung on each side, with the twine fastened to short sticks, so as to support the entire rank of trusses.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR MAY.

Although the weather during the greater portion of this month has not been to say very vegetative, the advices from nearly the whole of our large grain districts are to the effect that the wheats have progressed steadily, that the plants are strong and healthy, and, further, that there is every prospect of a good average crop. Most spring corn has perhaps shown greater progress than wheat; indeed, the general appearance of barley, oats, beans, and peas is most promising, even on what may be termed the worse cultivated soils.

The commencement of hostilities in Piedmont, and the sudden change in the corn laws in France—in other words the re-implication of the old sliding scale upon imports and exports of produce, thereby adding materially to the duties—have been productive of considerable excitement in the grain trade. Under the impression that the war would reduce the available amount of food for shipment to this country, wheat, at one time during the month, rapidly advanced in price; but since then the demand has fallen off, the quotations have given way, and the markets have shown greater calmness. There is one thing quite clear to our minds, that the return to “protection” in France must continue to exercise more or less influence upon price in this country; and we may observe also that there is every prospect of the aggregate importations of produce during the present year being on what may be termed a very moderate scale when compared with some former seasons, more particularly with 1858. When we bear in mind, however, that a very large quantity of wheat is still in stack here, we are not prepared to say that the assumed deficiency in our importations will lead to further excitement, or that we shall have what is termed “war” prices; nevertheless, the low period for wheat has unquestionably passed away, and we may look forward to greater steadiness, and a better range in value than we have had to report for many months past. The advices from New York still show a deficiency of food in the interior of the country. That deficiency—we mean the *exporting power* of the United States—will of course tend to check shipments to England, as well as to all other quarters; hence there will be very little competition in our markets on the part of the French and American millers. In the event, however, of the supplies of wheat in France being on a liberal scale, and of the exports of flour being equal to most former periods, we may look forward to the consumptive demand being easily met, but not to very high rates. Much, however,

will depend upon the future policy of the Emperor of the French, both commercially and politically, and the part which eventually England may be called upon to take in continental politics. A sudden closing of the French ports, as regards exports of flour, would have a great effect upon price here; but at present we see no reason to anticipate such a change as we have here alluded to, for the all-important reason that the supplies of grain on hand in the whole of the Departments of France are represented as still large for the time of year, notwithstanding that shipments of both wheat and flour during the present year have been on a liberal scale.

Barley, oats, beans, and peas, have sold at what may be termed fair quotations, and their present range of value in our markets will, we apprehend, lead to steady arrivals from our usual sources of supply. The extent of the shipments of oats from Russia is estimated at 960,000 quarters; but our impression is that the quantity will exceed that estimate. The stocks in the United Kingdom are now much reduced, but we doubt whether they are so small as they were at the same time in 1858.

The war in Piedmont, together with the sudden advance in the value of money at the Bank of England and elsewhere of 2 per cent., has had a depressing influence upon the wool trade. At the public sales of colonial, now in progress, very few continental buyers have made their appearance, and the biddings, though somewhat steady on the part of home dealers, have resulted in a decline in the quotations of from 1½d. to 3d. per lb. The private market has continued in a depressed state, and English wool has fallen quite 2d. per lb. on the average. The war may, it is true, have led to the decline; still we see nothing in the state of trade in the manufacturing districts to justify the heavy fall in price. However, buyers have to some extent been influenced by increased importations in the aggregate. In the first four months of the present year the total receipts into England amounted to 130,990 bales, against 122,382 bales in the same time in 1858. Since then, over 40,000 bales of colonial have arrived in London alone; so that the stock has continued to accumulate upon a lower range in prices. The latest accounts from Sydney state that the wool trade was heavy, at from 0½d. to 1½d. per lb. less money. Inferior clips were selling at from 1s. 9d. to 2s. 0½d.; fair to good, 1s. 6d. to 1s. 9d.; low to middling, 1s. 4d. to 1s. 7d.; grease, 3d. to 11½d.; locks, pieces, and broken, 8d.

to 1s. 2d.; handwashed, 1s. 3d. to 1s. 9d.; and scoured 1s. 10d. to 2s. 6d. per lb.

The backward state of the bine, and the appearance of fly in most plantations, have produced some excitement in the demand for hops, and a steady improvement in the quotations. The show of samples has been only moderate, and fine East Kent pockets have sold at 160s. per cwt. Scarcely any foreign hops have reached us; but we apprehend that the present advanced rates will induce steady shipments to this country.

Owing to a great falling off in the supplies, potatoes have been in somewhat active request, and an important advance has taken place in prices, 180s. to 200s. per ton having been paid for very fine samples. Considering the extent of the consumption during the past winter, and the enormous arrivals, it is quite clear that last year's crop was a very large one as to quantity. The quality of the growth has turned out good. The live stock trade has continued steady, though somewhat less active than in the previous month. Prices, almost generally, have ruled tolerably high.

In Scotland the grain trade, influenced by the state of the demand at Mark-lane, has been tolerably active, and prices have steadily improved. The stocks of produce in the hands of the growers are fully equal to most former seasons, and good shipments have been made to the south.

Throughout Ireland there has been less activity in the demand for wheat and other kinds of corn than in England. However, the quotations have improved, and the markets have been in what may be termed a healthy state.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

The increased stringency of the Customs' authorities in reference to the admission of live stock into this country—in other words, the severe inspection of the stock, to ascertain whether it has brought disease with it—has resulted in a considerable falling off in the arrival of beasts from the Continent; but the importations of sheep have been on an extensive scale. The latter arrivals, however, have been principally composed of stock from Germany, shipped by way of Hamburg. These sheep are of poor quality, and seldom worth more than from 21s. to 27s. each; consequently very little addition has been made to the actual supply of food from abroad. Our letters from Holland state that both beasts and sheep are in anything but a healthy state. Disease in the hoof is very common amongst the beasts, and rot has made its appearance amongst the sheep. We therefore anticipate only moderate importations from that portion of the Continent during the present year, more especially as the Customs will not allow stock to pass for consumption in any way affected with disease. A great outcry has been raised in certain quarters against the new system; but surely it is the duty of those placed in responsible positions to prevent the introduction of disease into the country. We have enough of it already here; indeed, at least one-third of the beasts exhibited in the metropolitan cattle market during the month have been suffering more or less from disease, either in the chest or hoofs. However, it is satisfactory to learn that very few fatal cases have presented themselves for some time past. The supply of winter food is now nearly exhausted, and an increased supply of grass in the pastures is now much required by our graziers. As yet, however, it has been small; but since the late fine showers of rain have fallen, there is an improved prospect of a full average hay crop. The demand for both beasts and sheep in our leading cattle markets has been less active than in the previous month and, in some instances, prices have ruled a shade lower.

However, the trade, generally, may be considered in a healthy state, and the consumption of meat appears to be quite equal to most previous seasons.

The annexed return shows the total imports of foreign stock into London during the month:

Beasts	856 head.
Sheep	8,919 "
Lambs	278 "
Calves	630 "
Pigs	26 "
Total	10,718 "
Same time in 1858	6,708 head.
" 1857	7,243 "
" 1856	3,556 "
" 1855	7,103 "
" 1854	4,703 "
" 1853	13,007 "
" 1852	8,506 "

The total supplies of home and foreign stock exhibited in the Metropolitan Market have been as under:—

Beasts	17,980 head.
Cows	482 "
Sheep and lambs	113,512 "
Calves	1,012 "
Pigs	2,260 "

COMPARISON OF SUPPLIES.

May.	Beasts.	Cows.	Sheep & Lambs.	Calves.	Pigs.
1858...	18,741	480	115,886	1,671	2,760
1857...	18,722	450	104,990	1,415	2,530
1856...	18,995	495	119,640	1,260	2,545
1855...	19,847	410	113,600	2,470	2,590
1854...	20,831	576	124,824	2,146	2,435

Last month, 11,300 Scots, shorthorns, and crosses arrived from Norfolk, Suffolk, Essex, and Cambridgeshire; 1,720 of various breeds from other parts of England; 2,000 Scots and crosses from Scotland; and 464 oxen and heifers from Ireland.

Beef has sold at from 3s. 4d. to 4s. 10d.; mutton, 3s. 6d. to 5s.; lamb, 5s. 4d. to 6s. 4d.; veal, 4s. to 5s. 6d.; pork, 3s. 2d. to 4s. 2d. per 8lbs. to sink the offal.

COMPARISON OF PRICES.

	May, 1856.			May, 1857.			May, 1858.		
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	
Beef .. from 3	0 to 4	10 .. 3	0 to 5	0 .. 3	0 to 4	6			
Mutton ..	3	6 — 5	4 .. 3	4 — 5	4 .. 3	2 — 4	6		
Lamb	3	4 — 6	6 .. 5	6 — 7	6 .. 5	8 — 7	0		
Veal	3	10 — 5	6 .. 3	8 — 6	0 .. 4	0 — 5	4		
Pork	3	4 — 4	8 .. 3	3 — 5	0 .. 3	2 — 4	4		

Up to Newgate and Leadenhall Markets, the arrivals of Scotch and country-killed meat have been on a full average scale for the time of year. On the whole, a steady business has been transacted, as follows: Beef, from 3s. 2d. to 4s. 4d.; mutton, 3s. 4d. to 4s. 6d.; lamb, 4s. 4d. to 4s. 6d.; veal, 4s. to 4s. 8d.; pork, 3s. 2d. to 4s. 2d. per 8lbs. by the carcase.

WEST GLOUCESTERSHIRE.

Since writing the last communication numerous changes in the weather have taken place, and to such an extent as to claim especial notice; the more so, because it has occurred at a season of the year when their results are watched with intense interest. Immediately preceding the time when it was written (April 14th), a temperature unusually warm, succeeded by a considerable quantity of rain, caused all the productions of the vegetable world to assume a promising appearance, indicative of early maturity. A great change, however, followed; on the 16th, and on the four following days, hail storms, with sleet, northerly winds, and other wintery aspects, accompanied by frosty nights, very materially checked the progress of vegetation, causing the wheat in many places to change colour, and the vigorous appearance which had previously existed waned away with ominous forewarnings, enough so to create alarm in over-sensitive minds. The early spring sown crops of barley, oats, and beans suffered in appearance from the same causes as the wheat. But as relates to the latter, it was a

saintry check to precocious and over-luxuriant growth. At this crisis, nevertheless, the unsettled state of affairs on the Continent, and the possibility of our being plunged in war created extraordinary excitement in the corn trade; thus the condition of the future crop became more than usually a subject of observation. Towards the close of the month we experienced rough winds with rain, accompanied by a somewhat cool temperature, which, without being forcing, was sufficiently favourable to vegetation, when improvements became manifest. Dry and cold weather inaugurated the present month, whereby the anticipated progress usual at that period was not realized, premising, however, that no unfavourable symptoms appeared among the growing crops. On the evening of the 17th there were some light showers, and on the following afternoon there was a copious fall of mild rain, which came very acceptably, though we have to-day a cool drying wind from the north-east. The changes which have taken place from time to time in the appearance of the crops, subservient in all cases to the changes of the weather, are thus explained. The remarks are the more necessary, from the fact of these communications being commonly introduced in the columns of provincial journals which are not published till the Saturday after they appear in this paper, consequently they are not read till nine or ten days have elapsed, during which period many important changes often take place. Having thus disposed of the past, we will proceed with the present aspect of affairs. Premising that the wheat plant on cold soils and in exposed situations had assumed a yellow cast, the rains which fell during some of the latter days in April, and especially on the 7th of May, have in most cases restored it, so that the general aspects are quite satisfactory and encouraging. With a succession of fine weather there is good reason to hope that the produce will equal, if it does not exceed, the abundance of last year's harvest. Barley, oats, and beans look flourishing. The pasture lands have not made that rapid progress they at one time gave promise to do, from the causes already named, though there is no cause for complaint. After the rain that fell on Wednesday the grass cannot fail to be very abundant. We have been much gratified by the result of an experiment made to test the value of crushed bones on grass land, in juxtaposition with guano, over which the former present an immense superiority. In this district the bone as a manure has only recently been introduced; but in the cheese-producing county of Chester, this valuable agent has for a length of time been used with great advantage, and equally beneficial results are in store for the dairy farmers in the no less celebrated vale of Berkeley. With such excellent opportunities as the seasons have presented, he must be a sluggish farmer who has neglected the opportunities to get his work in a forward state. A considerable breadth of mangold has been planted, much of it, as we think, too soon, as that which is put into the ground very early, when a forcing summer succeeds, is apt to run up a seed

stem very prejudicial to the quality of the bulb. The sowing of swedes is progressing. In some of the orchards the promise of fruit has been annihilated by the frosts; in others there may be a fair crop, but we cannot at present speak in favourable terms with any confidence. The combined fair and monthly market, held at Berkeley on the 16th, was well attended, and a satisfactory amount of business transacted.—May 19.

ISLE OF ELY.

It is now raining hard after a week of brilliant sunshine, and strong searching east and north-east winds. The nights have been uniformly cold and slightly frosty, and vegetation has progressed very tardily; and until we have a change of wind, and get some genial and life-giving breezes from the south-west, we can scarcely expect luxuriant vegetation. The time of year has now come, however, when we may reasonably expect the advent of spring weather. The wheat plant maintains its vigour, and perhaps has been benefited rather than otherwise by the severity of the weather. A few weeks ago it was growing too rapidly, and was getting full of coarse flag, and consequently was beginning to fall about in all directions, and looked weak and unpromising; but the cold dry winds of the last fortnight have stiffened and strengthened it considerably, and it is now as magnificent in its appearance as we could well desire to see it. Some of the thinly planted crops on our weakest and poorest fen soils are improving, and with seasonable weather may yet produce a fair crop. The oat crop has suffered most from the cold dry winds and frosty nights, and where infested with wire-worm has lost plant considerably. Unless we get a speedy change, we must inevitably have a very patchy and broken crop, which generally produces a very poor yield. Beans are beginning to run, and are thickly planted, but have in thousands of instances, in consequence of the frost, lost the eye, and must make a fresh lead before they can run. How far this may affect the crop, we venture not thus early in the season to predict. Most of our Fen farmers have sown their mangolds, and those first planted are just beginning to show themselves, and look unusually strong and healthy. This is an invaluable crop, and is becoming much more extensively cultivated. Grass keeping has become more scarce than it was a month ago, and where stocked at all heavily has wasted fast. It now wants a thoroughly good rain with warm nights. The clovers for mowing are very little forwarder than they were six weeks ago. The price of both lean and fat stock has been lower, and sales have been very slowly effected. The corn trade has manifested great unsteadiness, advancing 10s. per qr. one week, receding from 6s. to 8s. the next, and again advancing 3s. to 4s. the next. We can scarcely expect steady prices again, so long as the war in Europe is continued.—May 17.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

BUNGAY FAIR exhibited a very large show of store beasts, comprising shorthorns, Scotch, Irish, and Dutch, but the trade was very dull, and a large proportion was unsold. Of fat beasts there was also a very superior show, both in quantity and quality; at the earlier part of the day the trade was very flat, being without doubt affected by the dullness of the London market on the Friday, but as the day advanced, trade became brisker, and a fair amount of business was transacted at from 7s. to 7s. 6d. per stone, very superior 8s., good store pigs 25s. to 30s. per head, fat pork 6s. to 6s. 3d. per stone. There were a few good horses, but prices being high, but little business was done.

ELGIN MARKET.—There was a very large attendance, chiefly of grazing animals. Prices were rather stiff, but, notwithstanding, a great number changed hands at rates rather under those of last market. The following are a few of the sales, viz.: Mr. Mitchell, Wester Alves, sold a lot of polled three-year-olds at £20, Mr. Leslie, Hillockhead, Rothes, sold a pure shorthorn cow, four-years-old, with a calf at her foot, £24; Mr. Eddie, Bilbohall, sold a two-year-old stot, superior,

at £21; Mr. Grant, Whitereath, sold a lot of two-year-olds at £15 5s.; Mr. Eddie sold a lot of three-year-old queys at £17 5s., and a lot of two-year-old stots at £13; Mr. Muil, Clackmarras, sold a lot of polled at £10 10s.; Mr. Milne, Pittensair, sold a lot of two-year-olds, same class, at £2; Mr. Brander, Pittendriech, sold a lot of crosses, two-year-olds, at £15 10s.; Mr. Grant, dealer, Glenlivet, sold a lot of three-year-old crosses at £16; Mr. Cruickshanks, Rosehaugh, sold a lot of crosses, two-year-olds, at £13 10s.; the grievie of Altyre sold a lot of two-year-old crosses at £19 10s.; Mr. Stephen, Inchbroom, sold a lot of crosses, three-year-olds, at £21 15s.; Mr. Leitch, Inchstellie, sold a lot of two-year-old crosses at £18.—*Elgin Courant.*

FORRES MARKET.—A very limited show of beasts, and these were mostly grazing, and for which the demand was very good by farmers and local graziers. The young cattle especially were fetching high prices. One-year-olds, of but middling quality, £7, two-year-olds £10 to £16.

GRANTOWN TRYST.—A fair attendance, and the greater part of both sheep and cattle were sold. The prices

obtained, in general, would be a shade under the last market, which might be owing to the excessive dryness of the weather. Had there been a few refreshing showers previous to the market day, no doubt but prices would be fully equal to last yrst. The buyers chiefly consisted of parties buying in for the grass.

HAVEFORDWEST FAIR was unusually well supplied with stock of all descriptions, but there was scarcely any demand, and prices slightly decreased. Stores were not at all sought after. Cows and calves were somewhat in requisition, and sheep did not share the downward tendency of price. On the whole, however, it was a very dull fair. The demand for pigs was slack, and prices stationary, or perhaps slightly depressed.

HAY FAIR.—There was a tolerable supply of all sorts of stock, &c., but the shortness of keep made the market dull, except for fat stock, which still commands a good price.

HEREFORD FAIR.—The late drought had excited the fears of buyers and sellers of live stock, and the consequence was a dull demand for every description; values had not much receded, but although there was but a little depreciation, stock sold very sluggishly. Fat beasts were in most request; lean stock moved off slowly; had there been twenty-four hours' rain immediately preceding the fair, stores would have realized fully 10 per cent. more than they did, and the sales would have been as quick as they were slow. There were many useful cows with calves on offer, which were mostly sold. Fat wethers realized, shorn 7d. per lb., unshorn 8d. per lb. There was a large number of store pigs and sows with litters, for all of which there was a lively demand. In the horse fair there was the usual variety, though there is a remarkable falling off in the supply of first-class saddle and harness horses, which are consequently sought after eagerly, and realize great prices. Of moderate hacks there was a large number, and a great portion of them changed hands. Cart horses still maintain their value, though yearlings and two-year-olds have gone back in price.

HIGH BICKINGTON FAIR.—A good supply of cattle, and it was remarked that the animals generally were in prime condition. Cows and calves, £11 10s. to £17; barreners and young steers were worth from 10s. to 20s. a head more than they were three weeks since, and a good many changed hands. A dull sale for sheep, but a tolerable demand for lambs for the upper markets, and they sold freely at 7½d. per lb.; good fat hoggers were worth 6½d. per lb.; couples, 37s. to 46s.

LEDBURY FAIR.—The supply of fat cattle was very good; of sheep, the number penned was larger than at last fair; pigs, a moderate supply; horses were scarce, and but few changed hands; prices not quite so high. Buyers very numerous. Fat cows from 6½d. to 7d., ditto sheep, in the wool, 8½d. to 9d., shorn 6½d. to 7d. per lb.; pigs, 23s. to 35s. each for stores.

MAIDSTONE FAIR.—A good supply of horses, and a fair supply of stock, sheep, and pigs. Lean beasts sold at £5 to £12, Kent tegs fetched from 26s. to 37s. 6d., and Down tegs from 30s. to 35s. This was a reduction from the prices of last month of from £1 to £1 10s. per head in lean beasts, and 3s. per head in sheep. Notwithstanding the lowness of prices, business was unusually dull, the sales effected being remarkably few.

NEWARK FAIR.—The stock fair was supplied with a fair show, but buyers were very scarce, and only a little business was done. Good steers made £11 to £14; good drapes £11 to £12, inferiors could be had for less money; fat beasts made from 7s. 6d. to 8s. per stone. Many sheep were offered, but few sales were effected. Hoggs made 4s. or 5s. less money, in consequence of the low price of wool at present; ewes and lambs can scarcely be said to have had any price, for next to none were sold. The horse fair was larger than usual; many were shown, and buyers being plentiful, good prices were obtained.

NEWTON-STEWART FAIR.—The market was extremely dull. Prices, however, were high for those sold, three-year-olds selling from £13 10s. to £15, two-year-olds selling from £8 10s. to £12, stirks and six-quarters from 50s. to £6 10s. Of pigs there were three carts, selling from 11s. to 14s. each.

RENFREW FAIR.—There was a large display of milch cows, and a numerous attendance of buyers. Prices ranged high for good animals, and sales were effected freely for this

class; but inferior qualities were not easily disposed of at the rates asked, and a large number remained unsold. First-class cows ranged from £15 to £19, and inferior lots at proportionate prices. Fodder cattle, of which there was a good stock shown, did not sell well, and the greater portion of them were in comparatively poor condition. The prices for them ranged from £6 to £9, according to quality.

RIPON MAY FAIR.—A plentiful supply of beasts, but the quality was only middling, and to effect sales lower prices had to be taken. A few fat beasts sold at 6s. 9d. to 7s. 6d. per stone. The show of sheep was below the average, and little business done in them. Mutton, in wool 7d. to 7½d., clipped 6d. to 6½d. per lb.; well bred hogs 40s. to 48s., half-bred do. 23s. to 28s. per head.

RUGBY FAIR.—There were few fat beasts brought. Sheep were plentiful. Beef sold at 7d. per lb. Mutton (shorn), 6½d. to 7d. Tegs were dull of sale. There was a large quantity of store beasts, which, owing to the want of keep, were offered at low prices.

STOW-ON-THE-WOLD FAIR.—The horse fair was particularly good, there being no less than 1,200 horses on sale: a good business was done at prices varying from £250 downwards. A great falling off in the cattle fair. There was an average supply of sheep, and quick sales were effected. Pigs were scarce. Beef made 6½d. per lb., and mutton the same.

STURMINSTER NEWTON FAIR.—The supply of stock was somewhat below the average, both as regards quantity and quality. There was a considerable amount of business done, though purchasers for the most part were shy and cautious. Fat beef 11s. 6d. to 12s. per score.

WHITSUNBANK FAIR.—A good attendance of buyers, and the whole were disposed of at high prices. Bred hoggs ranged in prices from 37s. to 47s., half-bred from 24s. to 38s. There was a small show of short-horned grazing cattle, and few sales effected. A few lots of two-year-olds sold at from £11 to £13 10s. A few lots of stirks were shown, and met with a good demand at from £7 to £9. A good many Irish cattle were in the market, but there was little or no demand for them. A large show of cows, for which there was a good demand. A good show of horses, in which a fair business was done at all prices according to description.

IRISH FAIRS.—At **DUNDALK** the beef department was well supplied, and anything good was bought up, the top figure being 60s. per cwt. The description of milk cows offered was very indifferent. There was a large show of springers, but not many first-class animals, and prices ranged from £11 to £16 per head. In the cattle trade everything had a downward tendency, and the buying on the whole was very languid. There was a large supply of lambs, but buying was very slow. The pig fair was very extensively supplied, but bacon was very slowly bought up, and prices were down. At **BECTIVE BRIDGE** there was an average supply of store cattle. Beef was scarce, and varied in price from 55s. to 60s. per cwt., according to quality. Store cattle sold quicker and better than at late fairs, but yet a number were unsold. The supply of springers and milch cows was good, prices ranging from £13 to £16 and £18. Hoggets brought fair prices. Bacon lower in value. At **STROKES TOWN** there was a good supply of sheep and cattle, and a good attendance of buyers. There was a fair demand at much the same prices as those obtained at the late fair at Ballinasloe. Hoggets sold from 35s. to 48s. each; two-year-old sheep from 42s. to 52s. each; three-year-old heifers from £10 to £17; bullocks from £12 10s. to £17 each. At **CASTLEBRIDGE** business was dull in all descriptions, except in bacon pigs and prime sheep, which maintained their late prices, the former averaging 43s. to 46s. per cwt.

GLASGOW CHEESE MARKET, (Wednesday last.)—Seven tons passed the weigh-house scales, and there were two carts in the bazaar. Trade quiet, but prices firm. Prime early-made 65s., late-made 56s. to 60s., skim 24s. to 26s.

CARMARTHEN, (Saturday last.)—Fair supply of Butter; market steady and without change, prices varying from 90s. to 100s. according to quality. We have great complaints on the part of the farmers of the prevailing drought, no rain of consequence having fallen since the last month. With the exception of the Wheat plant all vegetation suffers seriously from the absence of that genial rain which appears to be such an obstacle to military operations in Sardinia, where it is in excess.

REVIEW OF THE CORN TRADE DURING THE PAST MONTH.

The general character of the past month was far from genial, nearly three-fourths of it being passed under a piercing east wind, with night frosts, which have made sad havoc with the early fruit, but no injury appears to have been sustained by the corn crops, though the expectation of an early harvest has ceased. The fine rains which fell at the month's close have produced very beneficial effects, and vegetation has vigorously resumed its growth, the fear of drought being greatly diminished, though the ponds in many localities are still deficient of water. While for a long period the markets presented so monotonous an aspect that it was becoming wearisome to observe or report them, the past month has witnessed extraordinary fluctuations every week, as the consequence of the sudden outbreak of war between Austria and France, with some apprehension that Russia would interfere, and all Europe be finally involved. The probability only of this event produced a steady rise in the value of wheat, in April the gain being about 5s.; but though the first Monday of May noted the extraordinary advance of 10s. to 12s. per qr., since the assurance that Russia will take no part in the strife, and that our own Government intends to preserve a strict neutrality, the summary of the four weeks' history scarcely shows more improvement than 4s. to 5s. per qr. in addition. The course of the averages exhibits a total gain of 12s. 7d. per qr. from the lowest point, viz., the first week in last January, when they were only 39s. 10d. per qr.; the next lowest being 40s. at the beginning of April; and the last average reaching 52s. 5d.; so that in less than two months we find a general advance of 12s. 5d. After all, we are only brought to the moderate range which we obtained in November, 1857, or eighteen months ago, when the averages were 52s. 6d.; and as the average of November, 1855, was as high as 80s. 10d. per qr., there is still ample room for a further advance, should our own country be involved in the European conflict. And who can vouch for the quiet of Germany? or the contentment of Napoleon should victory favour his armies?

Complaints already come from Northern Italy that the promising crops are in danger of not being gathered, and the waste that may be produced by the movements of immense hostile armies is incalculable. All the world too, excepting France

and this country, is less provided with stocks than usual, and upon the next gathering everything depends. There is, therefore, more probability of a speculative spirit than when the rates were unusually depressed, without the least likelihood of a return to the dead lock and low rates that lately ruled. The weather here, with advices from Europe and the seat of war, must influence markets, and we look for frequent fluctuations, the ultimate chance being more in favour of a farther advance than otherwise. Reports as to the growing crop in Europe are generally favourable, but there have been complaints of drought in Spain and Sicily, and the absence of snow in America has seriously thinned the wheat in many localities. In North Africa the corn looks fine, barley harvest being on the eve of commencement, and wheat was expected to be ready in June. Prices abroad have been more steady than expected, the near ports and Baltic having only fluctuated moderately, according to the tenor of advices from this country. The resumption of the sliding scale in France has arisen from the sudden termination of the discussions on the corn trade, occasioned by the outbreak of the war; and as the export duties are moderate, and the import duties are high, when prices are low, as at present, we should not be at all surprised to see this law again suspended should there be large exports to this country. The following statement shows the last foreign quotations.

At Paris the best wheat was worth about 42s. per qr.; at Amiens, 43s. 6d. per qr. At Antwerp French wheat was worth 46s., and native 50s. 6d. per qr. Red quality at Groningen 47s., white 48s. per qr. The price at Louvain was 47s. for 64lb. wheat. The top quotation at Rotterdam was 49s. 6d. per qr. 61lb. to 62lb. wheat at Hambro' was 53s. 6d. per qr.; white mixed Polish 54s. 6d. per qr. The best high-mixed at Danzig was worth about 58s. per qr. At Konigsberg and Berlin the value was about 49s. per qr. At Genoa, notwithstanding the presence of the armies, the price was only quoted 44s. per qr. After a previous dullness at Odessa, there had been extensive transactions, prices ranging from about 31s. to 40s. per qr. At Azoff the quotation was 38s. per qr. The French colonies in Africa were very short in stock, Algiers and Oran quoting 57s. to 58s. per qr. for hard wheat. Flour at Santander was worth about 42s. per sack. At New York, after some dullness occa-

sioned by the reopening of canal navigation, the wants of several places in the interior have revived prices, white Kentucky wheat being worth 1 dol. 93 c. per bushel (66s. per qr.), and winter red 1 dol. 55 c. per bushel (51s. 8d. per qr. of 480lbs.).

The first Monday in London opened on fair supplies, though there was but a small show of samples from Essex and Kent. This day had more excitement in it than experienced for years, hostilities having commenced between Austria and Sardinia, with the astounding report that Russia had formed a special treaty with France. This had already produced a great rise in the country, and holders in town scarcely knew how to ask enough, and the previous Friday in London being about 6s. to 7s. per qr. higher, a further advance was insisted on, some quoting the total rise from Monday as much as 10s. to 12s. per qr.; foreign was also raised 8s. to 10s. per qr., at which much business was done, there being a large attendance from all parts of the country. As the advance on the London market was more a response to that in the provinces than an example, so we found very differing accounts in different places. The markets held early in the week were all 10s. to 12s. per qr. higher, several, as Hull, Spalding, Gainsborough, Newmarket, and others, noting a still further improvement; but as the week wore, an important reaction commenced, as Russia had distinctly disclaimed a treaty with France, and prices lost all certainty. Liverpool, on Tuesday, after advancing 2s. to 2s. 6d. per cental on wheat, found no buyers on Friday without lower prices, and this was precisely the state of things in London on that day.

The second Monday, with a large foreign supply and a moderate English one, opened with a perfectly changed appearance, though there was very little showing from the near counties. For a considerable time there was quite a pause; English factors finally, in order to tempt millers, offered their runs at 5s. per qr. abatement on the previous Monday's rates; but this was of no avail, as a fall of 8s. was required to make sales: about this reduction was finally accepted by some Kentish factors, but generally the bulk was held over. The trade in foreign was almost equally paralyzed.

At such an unsettled time it was not to be expected country advices would be reliable, a panic generally prevailing. Leeds noted a decline of 6s. to 8s. per qr., so did Boston, St. Ives, Spalding, Bristol, and Gloucester. Louth and Lynn made the reduction 8s. to 10s., but the average was about 6s., and at the close of the week there was a partial recovery varying from 1s. to 4s. per qr., Liverpool on Tuesday was 1s. 3d. to 1s. 6d. per cental cheaper. Friday's trade being of a retail character improved 6d. to 9d. per cental.

On the third Monday there was a considerable foreign arrival, but not much of home growth. Essex and Kent in the course of the morning sent but a moderate quantity. The speech of the Prince of Prussia being rather warlike, an attempt was then made to recover the lost ground of the previous Monday; but this failed, and millers would not pay beyond 3s. to 4s. per qr. advance on the nominal rates of that day, and foreign factors, with the plenty on board ship, were content to accept 2s. per qr. over the then quotations. The unsteady character of the trade again appeared in the country reports, many places experiencing a renewed excitement. Sleaford, Market Rasen, and Bristol were about 5s. per qr. dearer; but Birmingham was slow, as well as Wolverhampton, only quoting a rise of about 1s., the London rise being about the average. Liverpool, after gaining 6d. to 9d. per cental on Tuesday, lost 3d. of it again on Friday.

On the fourth Monday there was something like a repeat of the second, with a large foreign arrival, and but a moderate show of English. Business was again at a perfect stand-still: some factors offered their samples at 2s. less; others were content to merge last Monday's advance, but at this reduction, which was 3s. to 4s. per qr., a few sales only were made, some millers requiring a fall of 8s. per qr., against which factors were firm. The country markets were baffled by the town advices: all were more or less affected, the range of the decline being from 1s. to 4s. per qr.; but Birmingham, Bristol, and Spalding did not lower prices more than 2s., and there appeared generally a good deal of resistance to a further reduction at such a period of fluctuation, some holders withdrawing their samples altogether.

The imports into London during the first four weeks of May were, 23,640 qrs. English, 87,194 qrs. foreign: against 20,154 qrs. English, 48,763 qrs. foreign, in the first four weeks of May 1858, showing a large increase in foreign as the consequence of the turn in the markets. The total imports into the United Kingdom for April were, 300,955 qrs. wheat, 288,702 cwts. flour.

The four weeks' exports from London were in wheat nil, in flour only 250 cwts.

The flour trade during the four weeks, as might be expected, has closely followed the wheat markets, though without equal fluctuations. The first Monday noted the important rise of 10s. per sack on Norfolks and other country sorts, and 11s. on the top price of town quality, the former being quoted 41s. and the latter 54s., but Norfolks though little altered on the second and third Mondays, settled to 38s. per sack on the 4th market, while in Town-made there was no change from the

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.
April 16, 1859	41	2	33	6	23	7	31	6	11	5	39	4
April 23, 1859	41	4	32	8	22	7	32	2	41	4	38	11
April 30, 1859	42	6	32	8	23	4	30	3	41	8	38	6
May 7, 1859	44	10	32	5	24	2	32	8	42	8	39	11
May 14, 1859	52	5	32	10	25	4	33	4	45	1	42	0
May 21, 1859	54	4	33	7	26	3	35	3	47	2	45	5
Aggregate average	46	1	32	11	24	2	32	6	43	3	40	8
Same time last year	44	4	35	9	25	4	31	9	40	4	42	0

PRICES OF SEEDS.

BRITISH SEEDS.

TREFOIL, New	.....	—s. to —s.
TARES, winter, new, per bushel	.....	—s. to —s.
MUSTARDSEED, per bush., now 12s. to 17s., brown 10s. to 12s.	.....	—s. to —s.
CORIANDBER, per cwt.	.....	14s. to 16s.
CANARY, per qr.	.....	64s. to 66s.
LINSEED, per qr., sowing —s. to 64s., crushing 54s. to 58s.	.....	—s. to —s.
LINSEED CAKES, per ton	.....	£9 10s. to £10 10s.
RAPESEED, per qr.	.....	76s. to 78s.
RAPE CAKE, per ton	.....	£5 10s. to £6 0s.

FOREIGN SEEDS, &c.

CLOVERSEED, red —s. to —s.	.....	white —s. to —s.
TREFOIL, .....	.....	—s. to —s.
HEMPSEED, small, 33s. per qr.	.....	Dutch —s. to 38s.
CORIANDBER, per cwt.	.....	16s. to 18s.
CABBAGE, .....	.....	36s. to —s.
LINSEED, per qr., Baltic 52s. to 56s.	.....	Bombay 58s. to 50s.
LINSEED CAKE, per ton	.....	£9 10s. to £11 0s.
RAPESEED, Dutch	.....	62s. to 66s.
RAPE CAKE, per ton	.....	£5 0s. to £6 0s.

HOP MARKET.

BOROUGH, MONDAY, May 23.—The unhealthy appearance of the bine, and the report of fly in various districts of the plantation, have created considerable excitement in our market, and prices have advanced from 12s. to 15s. per cwt. for the last growth, and a large business has been effected at the improved rates. Yearlings and Hops of earlier date have been in strong request, at higher prices.

Mid and East Kents	....	90s. to 112s.	choice	160s.
Weald of Kents	....	86s.	98s.	100s.
Sussex	....	86s.	92s.	100s.

POTATO MARKETS.

SOUTHWARK WATERSIDE, MONDAY, May 23. During the last eight days the arrivals by sea and rail have been considerable, as our market had been well cleared of old stocks. In consequence of the continued severe weather the trade has been active, at the following quotations:

York Regents	.....	per ton	50s. to 140s.
Ditto Flukes	.....	.....	140s. to 180s.
Lincolnshire Regents	.....	.....	90s. to 100s.
Dunbar Reds	.....	.....	90s. to 100s.
Perth, Forfar, & Fifeshire Regents	.....	.....	70s. to 90s.
Ditto Reda	.....	.....	60s. to 75s.
Ditto Rocks	.....	.....	75s. to 80s.
Foreign Whites	.....	.....	60s. to 90s.

BOROUGH AND SPITALFIELDS, MONDAY, May 23.

Since Monday last, only limited supplies of potatoes have come to hand coastwise and by land carriage, but their general quality is good. The imports have amounted to 224 bags from Rotterdam, and 100 tons from Duunkirk. Generally speaking, the trade rules firm, as follows:—

York Regents	....	100s. to 140s.	per ton.
Do. Flukey	....	160s. to 200s.	.....
Lincoln	....	90s. to 100s.	.....
Scotch	....	70s. to 100s.	.....
New potatoes	....	18s. to 24s.	per cwt.

ENGLISH BUTTER MARKET.

LONDON, MONDAY, May 23.—Our trade opens so badly for Butter this day, that it is difficult to make quotations for price, although sellers would readily submit to a reduction of 10s. per cwt. from the price of this day week.

Dorset, prime	....	per cwt.	98s. to 100s.
Ditto middling	....	.....	84s. to 94s.
Fresh	....	per doz. lbs.	9s. to 12s.

WOOL MARKETS.

ENGLISH WOOL MARKET.

LONDON, MONDAY, May 23.—Our market still continues in a very depressed state, notwithstanding that the supply of wool on offer is very moderate. For export to the Continent scarcely any business is doing, and, to force sales, further depressed rates must be submitted to by the holders.

Per pack of 240lbs.

Fleeces—Southdown Hogs	.....	£17	0to	£17	10
Do. Half-bred Hogs	.....	16	0	16	10
Do. Kent	.....	15	0	16	0
Do. Southdown Ewes and Wethers	.....	15	0	16	10
Do. Leicester do.	.....	15	0	16	0
Sorts—Clothing, picklock	.....	18	0	19	0
Do. Prime and picklock	.....	17	0	18	0
Do. Choice	.....	16	0	17	0
Do. Super	.....	14	0	15	0
Do. Combing—Wether matching	.....	18	0	19	0
Do. Picklock	.....	15	0	16	0
Do. Common	.....	13	0	14	0
Do. Hog matching	.....	21	0	22	0
Do. Picklock matching	.....	16	0	17	0
Do. Super do.	.....	14	0	15	0

LEEDS (ENGLISH AND FOREIGN) WOOL MARKET, May 20.—There is no improvement in the demand for combing, but for short wool there is a fair demand at steady prices. Both the demand and price of the former are regulated by the immediate necessities of the manufacturer. In colonial wool the trade is quiet, and it is so for low wool, in consequence of the wool sales at Liverpool, which have shown a somewhat improving tendency.

LIVERPOOL WOOL MARKET, MAY 21.

SCOTCH.—There is a fair demand with the trade only for immediate wants, for all kinds of Scotch wool, without any material change in the price, which, however, will be in favour of the buyers.

Laid Highland Wool per 24lbs.	....	s.	d.	s.	d.
White Highland do.	....	11	6	to	13
Laid Crossed do., unwashed	....	14	0	16	6
Do. do., washed	....	15	0	16	6
Laid Cheviot do., unwashed	....	15	6	17	6
Do. do., washed	....	18	6	22	6
White Cheviot do., washed	....	32	6	40	0

MANURES.

PRICES CURRENT OF GUNG, &c.

PERUVIAN GUANO, (per ton, for 36 tons)	.....	£12	0	to	£ 0	0	0
Do. Do. (under 30 tons)	.....	12	12	0	13	5	0
KOORIA MOORIA GUANO, (66 per cent. Phosphate and 1 percent. Ammonia)	.....	5	5	0	5	15	0

ARTIFICIAL MANURES, &c.

Nitrate Soda	£16 15 0 to £17 10 0	Sulph. of Copper	£ s d	£ s d
(per ton)	.....	or Roman Vi-	35 0 0	to 37 0 0
Nitrate Potash	29 0 0	tritol, for Wheat	.....	.....
or Saltpetre	29 0 0	steep, 1st qual.	.....	.....
Sulph. Ammonia	14 0 0	Ditto, 2nd quality	24 0 0	28 0 0
Muriate ditto.	23 0 0	Salt	1 0 0	1 5 0
Superphosph.	5 10 0	Bones, Dust, per qr.	6 6	1 16
of Lime	.....	Do. 4-inch	0 15 6	1 0 0
Soda Ash, or	11 0 0	Oil Vitriol	.....	.....
Alkali	11 0 0	concentrated	0 0 1	0 0 0
Gypsum	1 10 0	per lb.	.....	.....
Coprolite	2 10 0	Do. Brown	0 0 0	0 0 0

OIL-CAKES.

Linseed-cakes, per ton	Marseilles	£9 10 0	to	£10 0 0
Thin American, bris	£10 10 0	English	10 10 0	0 0 0	
Ditto huge	10 5 0	Rape-cakes, per ton	6 0 0	6 10 0	
Thick do. round (none)	0 0 0	Cottonseed cakes	5 10 0	8 0 0	

JOHN KEEN, 35, Leadenhall-street, (Late Odams, Pickford, and Keen.)

Agricultural Chemical Works, Stowmarket, Suffolk.

Prentice's Cereal Manure for Corn Crops	.....	per ton	£8 10 0
Mangold Manure	.....	.....	8 0 0
Prentice's Turnip Manure	.....	.....	6 10 0
Prentice's Superphosphate of Lime	.....	.....	6 0 0

Manufactured by Hodgson & Simpson, Wakefield, and Matthews & Co., Driffield.

Nitro-Phosphate	.....	per ton	£7 10 0
Ammonia-Phosphate	.....	.....	8 0 0

Vitriol, Bone, and Manure Works, Howden Dyke, Howden.

Ammonia Phosphate	.....	per ton	£8 10 0
Anderton's Turnip Manure	.....	.....	8 0 0
Super-Phosphate of Lime	.....	.....	7 0 0

END OF VOLUME L.

IMPORTANT TO FLOCKMASTERS.

THOMAS BIGG,

AGRICULTURAL AND VETERINARY CHEMIST,

BY APPOINTMENT, TO H. R. H. THE PRINCE CONSORT, K. G., &c.

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Begs to call the attention of Farmers and Graziers to his valuable SHEEP- and LAMB DIPPING COMPOSITION, which requires no Boiling, and may be used with Warm or Cold Water, for effectually destroying the Ticks, Lice, and all other insects injurious to the Flock, preventing the alarming attacks of Fly and Shab, and cleansing and purifying the Skin, thereby greatly improving the Wool, both in quantity and quality, and highly contributing to the general health of the animal.

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4 lb. for 20 sheep, price, jar included	£0	2	0
6 lb. 30 "	"	"	0	3
8 lb. 40 "	"	"	0	4
10 lb. 50 "	"	"	0	5
20 lb. 100 "	"	(cask and measure	0	10
30 lb. 150 "	"	included)	0	15
40 lb. 200 "	"	"	1	0
50 lb. 250 "	"	"	1	3
60 lb. 300 "	"	"	1	7
80 lb. 400 "	"	"	1	17
100 lb. 500 "	"	"	2	5

Should any Flockmaster prefer boiling the Composition, it will be equally effective.

He would also especially call attention to his SPECIFIC, or LOTION, for SCAB, or SHAB, which will be found a certain remedy for eradicating that loathsome and ruinous disorder in Sheep, and which may be safely used in all climates, and at all seasons of the year, and to all descriptions of sheep, even ewes in lamb. Price 5s. per gallon—sufficient on an average for thirty Sheep (according to the virulence of the disease); also in wine quart bottles, 1s. 3d. each.

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"Scoutton, near Hingham, Norfolk, April 16th, 1855.

"Dear Sir,—In answer to yours of the 4th inst, which would have been replied to before this had I been at home, I have much pleasure in bearing testimony to the efficacy of your in-

valuable 'Specific for the cure of Scab in Sheep.' The 600 Sheep were all dressed in August last with 84 gallons of the 'Non-Poisonous Specific,' that was so highly recommended at the Lincoln Show, and by their own dresser, the best attention being paid to the flock by my shepherd after dressing according to instructions left; but notwithstanding the Scab continues getting worse. In December I informed the 'Agent for the above Specific,' that the flock was not cured, and that it requires their immediate attention. The Agent informed me they should be at once seen to, but did not do so until five weeks afterwards, and in the mean time the Scab spread over the whole flock, that I never saw such a disgraceful sight in my life; and when the Dresser was sent over to inspect the Flock, he decided on not dressing them again, as one-third of the Sheep had lost half their wool. I then agreed with an experienced dresser in Norfolk to dress the flock, and when he saw the sheep he declined doing them, as they were so very bad, and the time of lambing so near. Being determined to have the Scab cured if possible, I wrote to you for a supply of your Specific, which I received the following day; and although the weather was most severe in February during the dressing, your Specific proved itself an invaluable remedy, for in three weeks the Sheep were quite cured; and I am happy to say the young lambs are doing remarkably well at present. In conclusion, I believe it to be the safest and best remedy now in use.

"I remain, dear Sir, your obedient servant,

"For JOHN TINGEY, Esq.,

"To Mr. Thomas Bigg."

"R. RENNY."

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