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R. M. Jacques

THE FARMER'S MAGAZINE.

MAGAZINE
LONDON
1856

VOLUME THE THIRTEENTH.

(SECOND SERIES.)

JANUARY TO JUNE, MDCCCXLVI.

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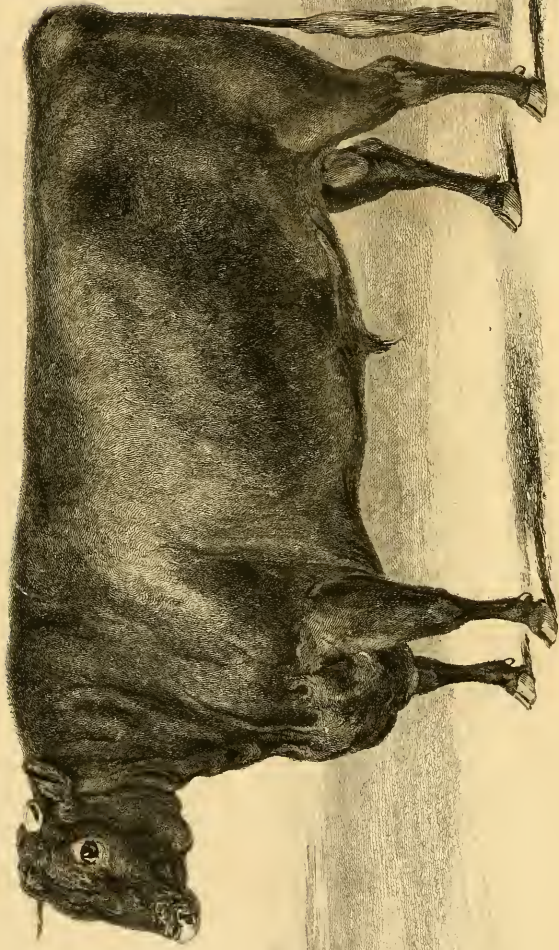
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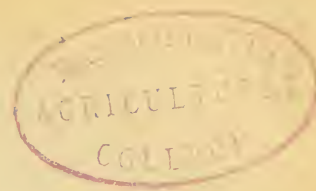
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Champion Chapter

*The above is a Bull of the City of New York, Sup. of the month of June which live first Prize
at the Fair of the City of New York, in the year 1846. It was owned by Mr. J. B. Smith.*



THE FARMER'S MAGAZINE.

JANUARY, 1846.

No. 1.—Vol. XIII.]

[SECOND SERIES.

PLATE I.

PORTRAIT OF R. M. JAQUES, ESQ.

ENGRAVED BY H. BECKWITH, FROM A PAINTING BY T. PHILLIPS, R.A.

PLATE II.

YEARLING BULL, CAPTAIN SHAFTOE.

ENGRAVED BY HACKER FROM A PAINTING BY DAVIES.

Yearling Bull, Captain Shaftoe, red, calved August 19, 1842, bred by Mr. Thomas Lax, of Ravensworth, near Richmond, Yorkshire; now the property of Mr. Unthank, of Netherscales, near Penrith; got by Magician, dam (Miss Shaftoe) by Mr. Mason's Miracle (2320), g. d. by Richard (1376), gr. g. d. by Fitz Remus (2025), gr. gr. g. d. by Whitworth (695), gr. gr. gr. g. d. by Charles (127).

At Richmond, Captain Shaftoe beat Cramer, the prize bull at Shrewsbury. Magician's pedigree is not yet given in the Herd Book; but he has been recently purchased for Sir C. Tempest, from Mr. Lax, who is an old breeder of some celebrity, and who purchased the bull Sir Dimple, at Mr. C. Colling's sale in 1810. Mr. Lax's celebrated twin bulls Bob and Shaftoe are also from the Captain's dam, a very fine cow which he bought from Mr. Shaftoe, of Whitworth Park, Durham, who was the breeder of Cassandra, dam of Clementi, Collard, and Cramer, each sold for 200 guineas, under one year old; which cow was by the same bull Miracle.

R. M. JAQUES, ESQ.

OF EASBY ABBEY, RICHMOND, YORKSHIRE.

It very rarely happens for a man to achieve any great eminence in a pursuit where natural taste is not one of the chief reasons for engaging in it. The heartiness with which he sets about and continues his endeavours, goes very far of itself, in this country, to ensure a favourable opinion with the public, if not absolute success in the experiment. There are few stronger or better examples of this than that afforded in the life of a man whose fortune and position rank him as an English country gentleman—a character which, however enviable in the abstract, has to mainly depend on the habits and disposition of its representative for the respect and good properties so generally attached to it. If the squire of the parish has unhappily no enjoyment in rural life, or the society of those with whom it is connected—if he goes through the common customs, and fulfils the certain duties of

his station, merely because he feels, or perhaps rather is told, he ought to pay attention to them, or that so much has invariably been expected from the family at the Hall—if there is little beyond these forms and ceremonies to actuate him, his name and countenance to the middle, his kindness and generosity to the lower classes will, depend upon it, be received with very much of that same want of innate sympathy and cordiality with which it is given. On the other hand, if the true country gentleman has the health, heart, and spirit to enter boldly into the well-doing of those around him—if he can really feel an interest and a pleasure not only in watching their progress, but in entering on the same employment of time and capital himself—if he has ability sufficient to stand amongst the first in suggesting improvement, and determination enough to figure as forward in carrying it out—if to the simple weight of his name he can add the counsel of experience and the zeal of participation, he will command an affectionate regard and a proud popularity, that no false pretences or forced motives, let them be ever so well contrived and concealed, could either excite or retain.

On these favourable terms have we to introduce Mr. Jaques as an English gentleman, while at the same time the very fact of his portrait appearing in this work guarantees him as an English farmer—a union that never yet failed in further increasing the advantages and recommendations of both characters. To the latter, indeed, of the two so interested, Mr. Jaques has in every way been more than a usually sincere and serviceable friend; his doings and successes as an agriculturist bearing rather on what has been effected for a whole body of farmers than any particular individual honour or object devised or accomplished for himself alone. Very many men, we are aware it may be said, have attempted this wholesale system of advancing a cause it is their desire to see improve; but none possessing equal fortune, and consequently equal temptation to do things by deputy, have studied or worked harder for the genuine good of the farmer than the subject of our present notice. Power of purse, to be sure, is a very fine starting point; but when we can join with it absolutely hard labour in furthering its beneficial influence—when we can witness such labour, well directed and long continued, gratefully acknowledged by those for whom it was employed, and triumphantly defeating those difficulties it had encountered, we must give, as in the present instance, the well-earned laurels to the *able* man rather than to the *rich* one.

Our opinion of the benefit arising from the establishment of farmers' clubs and local agricultural meetings has been too often repeated to require

farther consideration here; but were we requested to name any one whose object, management, and success would afford a good model for a new society of the same description about to be founded, we should unhesitatingly point to the Richmondshire Agricultural Association, or the Richmondshire Farmers' Club. And again, were we pressed to give some reason for the admirable system of either or both these institutions, we would impress upon our inquirer the manifest advantages of a good practical *working* patron, and furnish him with the name and address of R. M. Jaques, Esq., the late president of one, and chairman and acting secretary of the other; through whose indefatigable exertions and well-applied liberality they have chiefly reached that high position they now enjoy. Indeed, Mr. Jaques's efforts, suggestions, and improvements in agriculture have been so intimately connected with the transactions of these two societies, that it will be necessary for us to take something like a brief review of their rise and progress in enumerating the leading features in the career of their worthy "guide, philosopher, and friend."

The Richmondshire Agricultural Association held its first annual meeting in 1836; Mr. Jaques becoming president on the retirement of the Earl of Zetland, about the fourth year from its commencement. The Farmers' Club dates its origin some years after the Association, the rules and original list of members not being published before the July of 1841, in which we find Mr. Jaques leading off with the offices he yet fills of chairman and secretary. The Agricultural Association, although from the first gradually increasing in strength, did not reach any great or general importance until the fifth meeting, in October, 1840, when, amongst other additions to its funds and attractions, Mr. Jaques gave a judicious help in the following offer:—Two premiums at the next meeting, for stock the property of tenants at less than 500 pounds a-year rent; five pounds for the best cow, and five pounds for the best two-year-old heifer. The increase of the usual premiums at this agricultural show was afterwards, at the suggestion of Mr. Jaques, still further carried out by the formation of an additional class for that purpose; which was subsequently adopted by the Northallerton, Stockton, and other local shows in the neighbourhood at their formation. The good policy of confining certain premiums to such a class of agriculturists can scarcely be too greatly extolled: if any men need encouragement in their vocations, the small tenant farmer is surely one of the first who should have it. At the majority of these shows, however, we confess, the competition in almost everything being left entirely open, the farmer who is fighting his way up has disadvantages to contend with that often render it next to

impossible for him to exhibit his stock on fair terms, or with any reasonable hope of success; the great wealth alone of many of his opponents giving them a pull in all that relates to breeding and rearing stock, which the mere industry and experience of the man who farms for bread could scarcely be expected even for a moment to stand up against. To remedy this, and give every person, from the highest to the lowest interested in agriculture, a chance in attending and a pleasure in supporting such meetings, let every show have a stake formed on the principle of that Mr. Jaques started at the Richmond Association in 1840, and then shall we have Farmer Jones showing as much delight and pride in beating his neighbour Brown, as his Royal Highness Prince Albert or His Grace the Duke of Richmond, in beating all the world.

The next suggestion we have to notice, as proposed by Mr. Jaques, and afterwards acted upon mainly through his instrumentality, is equally worthy of attention and adoption, as far as it well can be, by managers of other societies of this character. Up to this very day, perhaps the most objectionable, as decidedly least satisfactory, department in the usual order of agricultural associations is that in which the implements are exhibited. With manufacturers who have a really good article, and purchasers who wish to have one, the short time and opportunity allowed for trial can scarcely ever be conducive of any lasting benefit to either. The one may almost as well spare himself that *pro forma* trouble, by putting just as much recommendation as he pleases into his circular; and the other rest contented with reading it. Mr. Jaques, with his usual judgment and spirit, was the first both to acknowledge and counteract the effect of this growing evil. At the Bristol meeting of the Royal Agricultural Society, in his capacity as president of the Richmond Association, he purchased one hundred pounds' worth of the best implements exhibited, and then and there invited their inventors and makers to a week's trial of them on a farm of his, called Broken Brea. This challenge was readily taken up, in the same straightforward tone it was given, by Messrs. Ransome, Clyburn, Crosskill, and other leading machinists; and a week passed in testing the merits of the different inventions, that every farmer may refer to with advantage, and that many a manufacturer has to thank for establishing the name and fame of his productions. The latter gentlemen, as a body, were loud in their approval of the course determined on by Mr. Jaques; and Mr. Ransome, in returning thanks on their behalf, paid a well-merited compliment to the chairman and his project, which we cannot, from its *à-propos* character, do better than

repeat: "He" (Mr. Ransome) "was perfectly satisfied with the manner in which the trial of implements had been conducted. If any advantage was to be derived from the use of good and perfect implements, that advantage would be increased in a tenfold degree could they bring them forth under circumstances of fair competition. At agricultural meetings, the time appointed for carrying into operation the awarding of premiums to implements was so short, that it was in the power of any one who chose to compete for the prize, and beguile the judgment of the judges by a machine which for a short time would perform its work, but if subjected to a fair test would be found to be, on the whole, incompetent to that for which it was intended. The prize, under such circumstances, however valuable it was for puffing the exhibitor of the implement into notoriety, instead of tending to supply the farmer with good implements, often induced him to purchase such as turned out ultimately to be worthless. To such an extent had this been the case, that he (Mr. Ransome) had determined in future not to place his implements in competition with those of others; but upon hearing of the proposition of Mr. Jaques, he made up his mind to attend if it were possible for him to do so. A too exclusive dwelling upon their own perfections often blinded individuals to the merits of others; but from the present trial, both him and his competitors would reap an amount of advantage which would tend to induce them to *introduce better implements* than any of them had done before. He congratulated the society on having so respectable, enterprising, and spirited a man as Mr. Jaques at its head."

The kind of "thorough investigation" thus auspiciously opened on has, we believe, been to a certain extent since continued by the Richmondshire Agricultural Association.* In proof of this we may mention, amongst many other proposals for establishing such an annual week's work, an offer made at this same meeting to Mr. Ransome, by the chairman, Mr. Jaques, viz., that if Mr. Ransome would attend, with implements from his manufactory, any similar trials at Richmond, Mr. Jaques would, in the event of his being awarded the first prize, pay all his visitors' expenses; if only a second prize, pay half his expenses; and if entirely unsuccessful, Mr. Ransome to pay his own. The following year Mr. Ransome availed himself of this offer, by sending down one of his ploughs, a pair of

* A considerable portion of the implements purchased having afterwards been distributed as prizes, instead of, and far preferable (as we think), to "money down," the expenses of the association were but little increased by this experiment.

Suffolk horses, and a managing man; and being thus entirely furnished with his own work and workmen, carried off the first prize in a field of twenty-seven competing ploughs. The liberality of this invitation is scarcely superior to the well defined terms on which it was given, as it naturally stands to reason that no one, without great confidence in the actual utility of what he purposed exhibiting, would avail himself of it. It is not, however, with the implements alone that Mr. Jaques has been so energetic in ascertaining their real virtues for the benefit of those with whom he is connected, he having two or three years previous to this set apart a certain portion on one of his farms for trying every new variety of wheat procurable. These samples, moreover, were *dibbled* at different distances (a mode of planting not very generally adopted with this seed), while the crop was always open for the inspection of any members of the association.

With the Farmers' Club matters are equally well managed; in the chief features of which, right worthy of attention from its contemporaries, are a register office for farm servants, started under the patronage of the club, and the custom of bringing forward and discussing on appointed occasions all sorts of subjects in any way bearing on the interests of farming and farmers. In these home-made arguments, so calculated to draw out and encourage men even of the most moderate pretensions, it is hardly necessary to add that the chairman and secretary take a very prominent and able part; as indeed he does in everything connected with that science—if we may thus designate it—to which he has so continually and successfully devoted his energies. In selecting and breeding his cattle we find the same determination to have the best, a statement that the stock sales at St. Trinians (Mr. Jaques's residence previous to the decease of his father), show ample evidence in support of, that might be yet further increased by the fact of Mr. Jaques's short-horns not only almost invariably gaining premiums at the Richmondshire, Northalerton, and Yorkshire Meetings, held at Doncaster, Hull, and York, but also in their having, at the Cambridge Meeting of the Royal Agricultural Society of England in 1840, taken two prizes, when their owner had sent but those two to be exhibited. These were a yearling heifer, Mermaid, and a bull called Clementi, portraits of both of which have appeared in this work. Also at the Bristol meeting, in 1842, a yearling heifer, Golden Drop, obtained the premium.

The sale of short-horns at St. Trinians, in Oc-

tober, 1841, and September, 1844, when Mr. Jaques, we trust for a time only, gave up breeding, we insert here as the "confirmation strong" of the talent displayed by comparatively so young a hand.

Name.	Sold for.	Purchased by.
Melody	173 gs.	Lord Hill
Mermaid	165	Mr. Booth, of Killerby
Golden Drop	160	Lord Hill
Lady Anne	135	Mr. Parkinson, of Ley-fields
Young Rachael	100	Mr. Brown
Concertina	87	Lord Hill
Dahlia	70	Mr. Harrison
Celia	67	Mr. Baker
Victoria	61	Mr. Brown
Warren Rose	61	Mr. Wetherell
Epaulet	60	Mr. Brown
Rosa	50	Mr. Hincks
Wild Rose	45	Mr. Knowles
Romp	42	Mr. Foster
Violet	40	Mr. Maynard
Etta	40	Mr. Drury
Rosebud	40	Mr. Mauleverer
HEIFER CALVES.		
Hippodamia	60	Mr. Lewis
Purity	51	Mr. Lewis
Caradori	41	Mr. Baker
Catilani	23	Mr. Baker
BULLS.		
Clementi	150	Mr. Rutson
Dulcimer, a bull calf	105	Mr. Booth, of Killerby
Magistrate, a yearling bull	40	Mr. Harrison

The very excellent painting *and* portrait from which our engraving is taken occupied a distinguished place in the exhibition of pictures at the Royal Academy the year before last, with a line or two of particulars in the catalogue that proclaim Mr. Jaques's worth far more concisely and decisively, perhaps, than all we have said in our endeavours to do justice to it. The heading runs and reads thus:—

“PORTRAIT OF R. M. JAUQUES, ESQ. Painted for the Farmers' Club, Richmond, and presented by the Members to Mr. Jaques.”

This is as it should be, and in recording the very high and appropriate mark of respect the members of the Richmond Farmers' Club have paid to their Chairman, in this portrait of an Eminent British Farmer, we cannot but congratulate them, in the words of Mr. Ransome, “on having so respectable, enterprising, and spirited a man as Mr. Jaques at their head.”

GEOLOGY AS APPLIED TO AGRICULTURE.

MONTHLY MEETING OF THE FARMERS' CLUB, DECEMBER 8.

The subject which stood for this evening was Geology as applied to Agriculture, and at six o'clock Mr. BAKER rose to open the question. He said it had been arranged that their discussions should commence at six o'clock in the summer, and at five in the winter; but he supposed it was almost as difficult to say when summer ended and winter began, as it was in some cases to draw the line between sanity and insanity. He had on a former occasion addressed some remarks to the members of the club, at one of their monthly meetings; and they had entered into the subject with so much interest that he was induced to make a second attempt of the same kind, treating the subject as applicable to the purposes of agriculture. Now it was doubtless rather a difficult task to treat the subject in this way, for he had never directed his attention to it as particularly applicable to agriculture, although he had profited by his geology to some extent as far as the knowledge of soils went. The most important matter perhaps known to geologists, in an agricultural point of view, was the substance called chalk, which appeared to be designed for the use of the agriculturist. No doubt all things were designed for our use; but it was impossible to regard the important uses of this substance so abundant in nature without adopting the view taken in the Bridgwater Treatise, and regarding its existence as an evidence of design on the part of the great Creator which led us to trace it up to its first source. In the primitive rocks no carbonate of lime was found; but these masses of chalk appeared to be formed of very minute insects or corals, so minute indeed as well to deserve to be termed animalcules, a thousand of which occupied only the square inch, but which by their continued efforts formed islands of vast extent. Thus in the course of time the little coral insects formed in masses until they got to the surface of the water, and these masses became little islands, forming another and another, until, joining together, they at length became almost continents, as in the south seas. Thus we had the key to carbonate of lime. By an examination of chalk with the microscope, it was found to consist of innumerable animal deposits; by inference, therefore, we were led to suppose that chalk was formed in the same manner and under the same circumstances as coral rocks. How these large masses of chalk were formed it was difficult to imagine, except by supposing that they were formed beneath the surface of the sea; they could not otherwise be so perfectly formed as they were. They were found sometimes to contain various shells, teeth of sharks, and other substances, which plainly demonstrate that they must have once formed part

of a vast inland or marine sea. The greater part of this kingdom is a large basin of chalk, which crops out in all directions towards Dover, Cambridgeshire, and Huntingdon, of which London is supposed to be the centre. This immense basin of chalk is supposed to be the bottom of some inland sea, formed by an invasion of the waters, as a succession of both fresh water and marine animals has been found therein. The London clay would appear to have been the deposit formed in this great basin of chalk, for on examination it appears to be immediately in this basin. In this mud have been found vast varieties of the remains of animals, and the chalk is seen cropping out in all directions. The chalk is not a level surface, having been apparently acted upon by volcanic action, or by some other power from below. This is the case under London, and the surrounding counties; and therefore it is that, in boring for water, we sometimes find the chalk much nearer, and at other times much deeper, from a given point, than we expect. One of the principal uses to which this knowledge of the relative position of the London clay and chalk had been applied was that of boring for water. An opinion had formerly existed that Essex was a very unhealthy county; all that portion of it lying south-east of Chelmsford was formerly very subject to agues, and was doubtless a very unhealthy district. A great deal of miasma was generated, and labourers going to get in the harvest in that part of the country used frequently to be attacked with ague. This arose from the great quantities of stagnant water which were necessarily kept for domestic purposes; but, after the modern plan of boring through the chalk had been adopted, and fine springs of water had been obtained, sufficient for the cattle and every domestic purpose, this had not been the case. Springs thus obtained were frequently called Artesian wells (from the fact of the plan having been brought to this country from the province of Artois, in France); but in Essex they were generally termed "bored water," simply. Mr. Baker here exhibited several diagrams, in explanation of the geology of the portions of Essex in the vicinity of Saffron Walden and Chelmsford, and showed how the chalk and the clay had, by the action of the water, in some places become mixed. He had first brought this under the notice of the London geologists, showing that it was not a distinct and separate formation, but only two substances united. It was in the case of some of the Artesian wells that the water did not rise to the surface at one time, and that it would at another: this phenomenon appeared to depend upon the tides; for, al-

though the water in the instances mentioned would not come to the surface when the tide was down, it would rise when the tide was up. It was therefore evident that, at some point or other, this water did find its way out into the sea; that was clearly ascertained, and showed that there was a connection between the chalk and many parts of the ocean. By other diagrams he exhibited the alluvial deposits which were to be found embedded in the clay in parts of Essex, and stated that it was from the nature of the Essex soil that they were enabled, by the use of wood or even straw, to make drains at a very small cost, which would last for ten or twenty years. Mr. Smith, of Deanston, had expressed his surprise that they did not make permanent drains, as they did in Scotland; but, as the drains to which he had alluded, from the particular local circumstances, answered so well, it was not to be expected that they should construct permanent drains at a cost of four-and-thirty shillings an acre. It was very different, however, when they came into the middle portions of the country, where they had what they called "squally" land, or land consisting of alternate successions. The ordinary mode of draining would not do there; and it was necessary to resort to pipe, or tile, or stone, according to Mr. Smith's plan. As long as the water met gravel only, it would flow from the high lands to the low freely enough; but, as soon as it came in contact with clay, an accumulation of water took place, until it broke forth in what was termed a common spring. All the lands termed "squally" were affected in the same way; and, if not drained, the bottom water did great injury to the crops. The value of geological knowledge, in the pursuit of agriculture, must be evident from the fact that a good geologist must know far more of what was passing beneath than he who was only acquainted with the surface. He (Mr. Baker) had, on several occasions, opportunities of making useful suggestions to those who were conducting operations in ignorance of the science of geology—namely, digging for water in the London clay. He told them that they were only spending time and money in so doing, as no water was to be found until they got through the chalk; and as it was probable they would not reach the necessary depth under many hundred feet, it would be better to resort to the process of boring. It turned out as he said, and one gentleman had got water at a depth of 463 feet, and another at about 500. In this clay were found remains of large shells of the oyster kind, sharks' teeth, gourds, seeds, and plants of a singular character. He had mentioned this fact to show that a knowledge of geology might frequently prove of great advantage, and that it might moreover not only save a useless expenditure of money, but also

spare us from the ridicule of those about us. It was of no matter to what depth a person bored, if he got into a wrong series; and hence a knowledge of geology was of great importance in this respect. The geologist, as soon as you showed him the sub-soil, knew what to expect beneath it. The London clay of Essex, Kent, and the surrounding counties, formed one of the least productive soils of any, but, when combined with chalk, became one of the most productive, and grew the best wheat perhaps of any soil (*hear*). In many such soils, where chalking was resorted to, no other manure was necessary; but it was remarkable that, fertilizing as the first application was, the second application did not take at all, so that there was some chemical action at work, which was not clearly understood. He had tried it upon farms at Writtle; and although he did it at great expense, having to bring the chalk from some distance, he had always found it answer. He had found, in the case of lands which were covered with the May-weed, hemlock, and a sort of wild marygold, that, after the application of forty, fifty, or sixty loads per acre, these weeds were no more seen (*hear*). From the irregularity of the position of the London clay, in many cases, it would appear to have been forced upwards by some considerable power; the same was occasionally observed with respect to coal. In one part of Essex the London clay was observed to be forced up exactly as if it had been built up into a kind of wall. These "faults" of clay appeared to be designed by the Almighty power for the purpose of giving us water in every part of the earth; for, without them, the water would drain off from the high lands to the low, leaving the former altogether without. When there was too much water flowing through the land, the practical farmer cut his drain, and turned it off much in the same way as a surgeon in an aneurism takes up the artery. Mr. Baker here exhibited several diagrams for the purpose of showing that the stratification ran in a particular direction—namely, from north-west to north, and also that the series were alternating. The same geological observations which applied to one county would not apply to another: in one direction we found Bath or Portland stone; in another Oxford clay; then the oolitic series, and so on until we came to coal. Where they found stone, it was useless to dig for chalk, because it was always found lying higher than stone. It was only by a thorough knowledge of this science that we could tell which was the higher and which was the lower series. By the application of this knowledge, large portions of the county of Norfolk, which formerly only produced a few rabbits, had been converted into one of the finest corn-growing districts of the country. The

whole of Lincolnshire was formerly nothing but a bog, upon which there was partial vegetation, forming peat; now, by digging through the peat until they arrived at the clay, and spreading that clay upon the surface, they had produced land which grew as fine corn as any in the kingdom. It was to a knowledge of geology and chemistry that was to be attributed the superior knowledge of the farmer of the present day as compared with the farmer of 200 years ago (*hear, hear*). With some encouragement, with a proper application of their talents and capital, and with some certainty as to the fate which awaited them—for nothing was so mischievous as uncertainty (*hear*)—the position of the farmer might be greatly improved (*hear*). There were many other points of this delightful science to which he might draw their attention, said the hon. gentleman, and proceeded to allude to the remains of fish of a rude form and character, which were often found in pieces of slate. These fish appear to have been fortified with means of self-defence far beyond those of our age. Other remains showed that the vegetable world of the period to which these specimens belonged differed widely from the vegetable world of the present age. For it was common to find ferns 30 or 40 feet in height—as many feet, in fact, as they now were inches. Other plants of an enormous size were found embedded in clay, which must have been deposited there long after the coal formation took place. Vast amounts of vegetable matter, which had grown upon the surface of the earth, indeed, appeared to have been forced down either by some hurricane or tempest, and thus to have formed the immense beds of coal-like peat which were sometimes discovered. In a similar manner the deposit from which coal was formed had doubtless taken place; and although at first sight there did not appear anything like design in all this, yet now that in these latter ages of the world we were reaping the benefit of it, we could not but attribute it to one of the great designs of Providence for our benefit. In no one instance had any remains of vertebrated animals been found in the limestone series. But in the later formations we began to find organised remains, and a gradual succession of animals, apparently following each other in the habitation of the world—such as, first, fish of a very rude form; then vegetables; then animals adapted to living on the earth or in the water, having fin-like feet; and so on, until at last the earth became a fit habitation for man. All this was the work, not of ages merely, but of millions of ages. Of all the different kinds of animal and vegetable remains which had been found at different times and under different circumstances, every one had, doubtlessly, at some time or other been on the

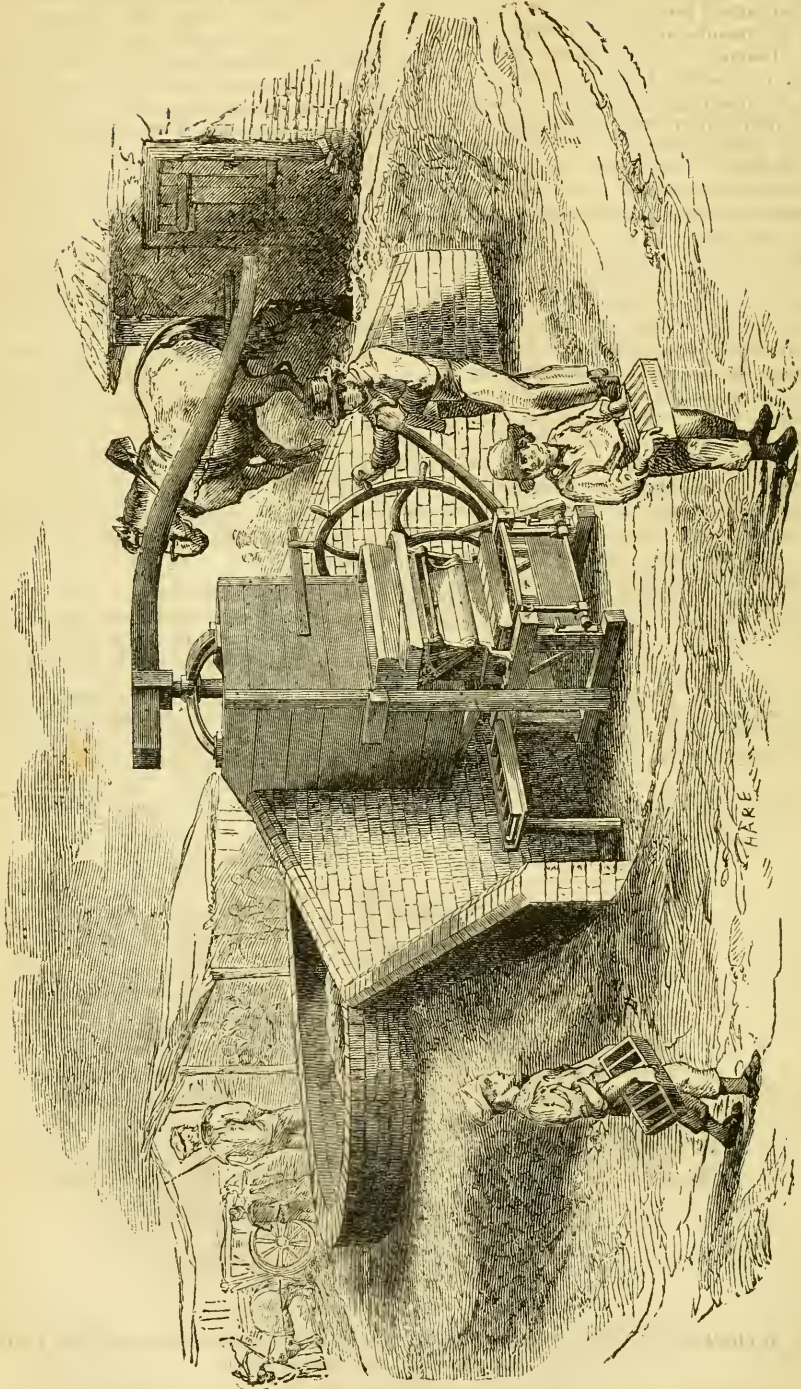
surface of the earth. They must have existed there before they were deposited where they were found; they were justified in arguing, therefore, that the earth had been gradually progressing for many ages, until it arrived at its present state of existence. There had been a good deal of difference of opinion upon this point at first, but Dr. Buckland had explained many of the difficulties. It was now well known that when Moses spoke of the earth's having been created in the space of seven days, he did not mean seven periods of twenty-four hours each. In the Hebrew, the word "day" was variously applied, and had several different and distinct significations; sometimes it meant the ordinary day of 24 hours, at others the measure of man's life, and others much longer periods. With this understanding of the term, the books of Moses were found to agree perfectly well with the calculations of philosophers of the present day; but however deeply they might investigate, there was still something which the finite mind of man could not reach, because he had the works of an infinite mind to contemplate (*hear, hear*). After some further remarks, Mr. Baker resumed his seat amid the applause of the meeting.

Mr. HUMBY then rose to move a vote of thanks to Mr. Baker for the lecture he had delivered. He had heard his observations with much delight, and he was sure the club owed him a greater debt of gratitude for the part he always took in their discussions, and the handsome manner in which he at all times endeavoured to advance the interests of the tenant farmers of England, than it could ever repay (*cheers*). He concluded by moving a vote of thanks to Mr. Baker.

Mr. BROWN said he quite concurred in the sentiments expressed by Mr. Humby, and with great pleasure seconded the motion, which was carried unanimously.

Mr. BAKER returned thanks. He said he did not feel that he had done anything to boast of, but he was very much obliged to them for the kind expressions to which they had given utterance. He had always been identified with those who, like himself, were connected with agriculture. They were a very intelligent class of men, and he had found by experience that they only wanted to be brought out (*hear*). There was much good to be done, as Sir Robert Peel had said, by a number of men meeting and rubbing their minds together; if twenty men met, and communicated to each other what they knew, the chances were that each of the twenty would go away benefited by what each had individually stated (*hear, hear*). It was the duty of all to contribute to the general good, and, by so doing, we were only filling that place in the human family which Providence had designed.—Adjourned,

HALL'S PATENT BRICK MACHINE.



MANUFACTURED BY FREDERICK RANSOME, IPSEWICH

HALL'S PATENT BRICK MACHINE.

Strongly as we advocate the most rigid economy in every mechanical process employed either in agricultural or manufacturing operations, still it is not mere cheapness that we would recommend; for, unless the quality of the operation, or article produced by machinery, be equal or superior to that which results from manual labour, we should not think it would be wise to allow the former to displace the latter; but where it can be shown that by the aid of machinery any given process can be conducted, through a less expensive channel, to a more uniformly perfect standard of excellence than can be achieved by mere manual dexterity, in such a case, we should feel no difficulty in advising the use of mechanical auxiliaries; and in stating this, we believe we are advocating the *real* interests of the labouring classes. The manufacture of pipes and tiles for draining purposes, suggests a case in point: within the last five or six years, upwards of forty new machines, varying in merit, have been brought into activity, many of them with remarkable success; and the result is, that the price of draining and some other tiles has been brought down nearly 70 per cent., whilst the demand has increased—say, for the purpose of argument, 300 per cent.; and we have the same number of men and boys receiving the same wages, in full employment, and manufacturing by the aid of machinery three times the quantity, and of a better quality, than could be made by hand.

On the subject of increased demand, although we cannot quote from positive statistical authority, we have conversed with many eminent agricultural engineers and tile-makers, who are of opinion that it is nearer 3000 per cent. than 300; and that, con-

sequently, ten men and boys are now in full work with the machines, where only one could obtain employment as a tile-maker previous to their introduction. Now taking this statement as only an approximation towards the fact, it is enough to show that tile-machines at least must stand acquitted of having deprived the "labourer of his hire." The same observations will, we hope and believe, apply to the general introduction of machines for the manufacture of bricks. We this month present our readers with a beautiful wood-cut of one that is considered to be the most effective yet introduced to public notice; and that there is ample room for improvement in this (at present) rude art, will be readily admitted by any one who has ever looked upon the miserable misshapen things that are manufactured in the vicinity of the metropolis, and called bricks.

This machine is the invention of Mr. Hall, an American brick-maker, and is in general operation throughout the United States. It is so simple and efficient in its construction and performance, that it seems destined here also to take the lead. It consists of a pug mill upon an improved principle, to which the moulding apparatus is so attached, that the clay, after passing through the pug mill, is forced immediately into a series of moulds prepared to receive it.

The bricks made by this machine are much sounder and better than those made by hand; and with the power of one horse and two men, from 8,000 to 10,000 bricks can be produced per day.

One of these machines can at any time be seen in full operation, by applying to Mr. FREDERICK RANSOME, at Flint Wharf, Ipswich, sole proprietors of the English patent.



MESSRS. BARRETT, EXALL, AND ANDREWES' (OF READING) HAND THRASHING MACHINE AT WORK.

These machines have now been before the agricultural world nearly three years; and the many hundreds in use afford the best testimony to their value, and the highest prize that can be awarded to the very respectable firm who invented it. An important improvement has lately been introduced in

the construction of the concave or breasting, which is made to expand or contract, so as to maintain a uniform space between it and the drum, thus adapt-

ing it to all kinds of grain or seed. The adjusting screw is fitted with a pointer, which shows on the index how to set it for any particular grain.

THE COMPOSITION OF ORGANIC MANURES.

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

Their Gases.—Nitrogen.

In this paper I propose to investigate the composition of those portions of the organic fertilizers which are composed of only gaseous substances, or are absorbed by the plant in the state of gas. That vegetables contain these in very large proportions, we are well assured; and it is only in case this assertion should be doubted by the younger portion of my readers that I insert, as an introduction to the subsequent observations, the analysis of a few of the farmers' commonly cultivated crops;

	Hay from		Clover- seed.	Aftermath		Wheat.	Hay.	Potatoes.
	Young	Oats.		Hay.	Peas.			
Carbon . . .	507	507	494	471	465	455	458	441
Hydrogen . .	66	64	58	56	61	57	50	58
Oxygen . . .	389	367	350	349	401	431	387	439
Nitrogen . .	38	22	70	24	42	34	15	12
Ashes . . .	—	40	28	100	31	23	90	50

The composition of plants, and the sources from whence they derived their constituents, long since engaged the chemical philosopher's attention. The history of the research—how, step by step, the chemist's repeated and laborious experiments added to the farmer's knowledge, one fact after another, constitutes one of the most valuable pages in the history of chemistry. It is needless in this paper to examine this interesting progress of knowledge; the conclusion to which these researches lead appear to be pretty well established—that plants absorb all their purely organic constituents in the gaseous state, and that of these only a portion of the carbon and the oxygen are derived from the atmosphere in which the plants are placed, but that their nitrogen and their hydrogen are chiefly absorbed from the decomposing organic substances of the soil.

Experiments made as long since as the days of M. Saussure seem to have proved that plants do not absorb the nitrogen, but that they do absorb the carbonic acid gas which is contained in the atmosphere in which they are placed. Amongst other trials (*Thomson's Chem. v. iv., p. 345*) he caused some plants of the *Vinca minor* (lesser periwinkle) to vegetate in a confined portion of air. The following table gives the composition in

and this I take from page 36 of the valuable Lectures on Agricultural Chemistry and Geology, by Professor J. F. Johnston, merely requesting the student to remember that the first substance on the list, carbon (charcoal), is absorbed by the growing plant only in the state of gas, when—as, for instance, united with oxygen—it forms the carbonic acid gas (or fixed air) of the chemist. The following table, then, gives the composition of 1000 parts of eight different substances:—

square inches of that air *previous* to the introduction of the plants, and *after* the periwinkles had vegetated in it for six days :

	When put in.	When taken out.
Nitrogen . .	211.92	218.95
Oxygen . . .	56.33	71.05
Carbonic acid gas	21.75	0.00

The cultivator will notice in this table, that although the plants absorbed all the carbonic acid gas, yet that the nitrogen of the air was rather increased. It then became a question of considerable interest, from whence is the nitrogen of vegetable substances obtained. All later researches seem to show that this portion of their food enters into the plant in combination with other substances, as in ammonia (composed entirely of nitrogen and hydrogen) or nitric acid (nitrogen and oxygen). And these conclusions of the chemist are entirely supported by the observations of the practical farmer. To give an instance: if it be true that nitrogen is absorbed by the roots of plants in combination with other substances, then it would be apparently reasonable to conclude that those crops manured with fertilizers the most abounding in nitrogen should yield, upon examination, a larger proportion of that gas than those not so treated. Now, from the results of careful exami-

nations, the chemist quite agrees in the correctness of this assumption. Take, for instance, the wheat plant, and examine the composition of the flour it produces (composed chiefly of starch and gluten) as raised by being dressed with various manures, and it will be found that the proportion of gluten (which contains 7.8 per cent. of nitrogen) is invariably increased by the increased proportion of the nitrogen in the manure. M. Hermstadt's experiments on this question are very important; he sowed equal quantities of the same wheat on the same ground, and manured them with equal weights of different manures: from 100 parts of each sample of grain produced he obtained starch and gluten in the following proportions (*Johnston's Lec. on Ag. and Geo.*, p. 103):

	Gluten.	Starch.	Produce.
Soil, simple	9.2	66.7	3 fold
Potato haulm	9.6	65.94	5
Cow dung	12.0	62.3	7
Pigeons' dung	12.2	63.2	9
Horse dung	13.7	61.64	10
Goats' dung	32.9	42.4	12
Sheep's dung	32.9	42.8	12
Dried nightsoil	33.14	41.44	14
Dried ox-blood	34.24	41.3	14
Dried human urine	35.1	39.3	12

The farmer will notice how steadily the proportion of the gluten (starch does not contain nitrogen) is increased with the increased proportion of nitrogen (or *richness*) in the manure. Mr. J. Hayward has given the proportion of nitrogen contained in one ton of various commonly-employed manures (*Far. Mag.*, v. xx., p. 138):

	lb.	oz.
Farm-yard manure	11	0
Night-soil	39	8
Fresh bones	120	0
Rape dust	70	0
Dry blood	366	0
Guano	182	8
Shoddy	270	0
Sulphate of ammonia	470	0
Soot	41	6
Nitrate of potash	299	0
Pearl ashes	—	—
Nitrate of soda	364	0
Common salt	—	—
Gypsum	—	—
Urine, per 100 gallons	15	8
Gas liquor, do.	18	0

Indeed, as Professor Johnstone remarks (*Ag. Chem.*, p. 170), the amount of nitrogen present in each of the organic manures affords one of the readiest and most simple tests by which their relative agricultural values, compared with those of vegetable matters and with each other, can be pretty nearly estimated. In reference to their relative quantities of nitrogen, therefore, they have been

arranged in the following order, the number opposite to each representing the weight in lbs. which is equivalent to or would produce the same sensible effect upon the soil as 100lbs. of farm-yard manure:—

Farm-yard manure	100	lbs.
Flemish liquid manure	200	
Solid excrements of the cow	125	
" " " " of the horse	73	
" " " " of the cow	91	
" " " " of the horse	16	
Mixed ditto of the cow	98	
" " " " " of the horse	54	
" " " " " of the sheep	36	
" " " " " of the pig	64	
Liquid blood	15	
Dry blood	4	
Dry flesh	3	
Pigeon dung	5	
Feathers	3	
Cow hair	3	
Bone shavings	3	
Dry woollen rags	2½	

The fertilizing properties, however, of these vary very considerably, according to their state of decomposition. Liquid manure, for instance, is well known to the farmer to be more powerful after it has undergone the putrefactive fermentation, that is when its proportion of ammonia is increased; that such is the case may be seen from the following important analysis, by Sprengel, of 100 parts of the urine of the cow in three different states (*Ag. Gaz.* vol. i., p. 342); the first specimen being in its fresh state, the second when putrefied by itself, the third putrefied with its own bulk of water:—

	Fresh.	Putrid.	Watered.
Urea	4000	1000	600
Albumen	10	—	—
Mucus	190	40	30
Benzoic acid	90	250	120
Lactic acid	516	500	500
Carbonic acid	256	165	1533
Ammonia	200	487	1622
Potash	664	664	664
Soda	554	554	554
Silica	36	5	8
Alumina	2	—	—
Oxide of iron	4	1	—
Oxide of manganese	1	—	30
Magnesia	30	22	—
Chlorine	272	272	272
Sulphuric acid	405	338	332
Phosphoric acid	70	26	46
Acetic acid	—	1	20
Sulphuretted hydrogen	—	1	30
Earthy phosphates and carbonates	—	180	150
Water	92624	95442	95481*

* "During the putrefaction of dead animal bodies," remarks Professor Johnstone (*Elements of Agri.*

“Such great differences,” observes Professor Liebig (*Organic Chem.* p. 81), “must be owing to some cause; and this we find in the different methods of cultivation. An increase of animal manure give rise not only to an increase in the number of seeds, but also to a most remarkable difference in the proportion of the gluten which they contain. Animal manure acts only by the formation of ammonia: one hundred parts of wheat grown on a soil manured with cow-dung (a manure containing the smallest quantity of nitrogen) afforded only 11·95 parts of gluten, and 64·34 parts of starch; while the same quantity, grown on a soil manured with human urine, yielded the maximum of gluten, namely 35·1 per cent. Putrefied urine contains nitrogen in the forms of carbonate, phosphate, and lactate of ammonia; and in no other form than that of ammoniacal salts.” “All animal manure,” he adds in another place (p. 85), “emit carbonic acid and ammonia as long as nitrogen exists in them. In every stage of their putrefaction, an escape of ammonia from them may be induced by moistening them with a potash ley; the ammonia being apparent to the senses by a peculiar smell, and by the dense white vapour which arises when a solid body, moistened with an acid, is brought near to it.”*

It is worthy of notice, as I have elsewhere had

Chem. and Geol. p. 22), “ammonia is invariably given off. From the animal substances of the farm-yard, it is evolved during their decay or putrefaction, as well as from all solid and liquid manures of animal origin. Ammonia is naturally formed also during the decay of vegetable substances in the soil. This happens either, as in animal bodies, by the direct union of their nitrogen with a portion of the hydrogen of which they consist, or by the combination of a portion of their hydrogen with the nitrogen of the air; or when they decompose in contact with air and water at the same time by their taking the oxygen of a quantity of the water, and disposing its hydrogen at the moment of liberation, to combine with the nitrogen of the air, and form ammonia. In the two latter modes ammonia is formed most abundantly when the oxygen of the air does not gain the readiest access. Hence in open subsoils, in which vegetable matter abounds, it is most likely to be produced. And thus one of the benefits which follow from thorough-draining and subsoil ploughing is, that the roots penetrate, and fill the soil with vegetable matter, which, by its decay in the confined atmosphere of the subsoil, gives rise to this production of ammonia.”

* It must be carefully borne in mind by the student, that it is to the gaseous matters of which ammonia is composed that the salts of which it forms a portion owe their fertilizing properties; ammonia, as I have before stated, being composed of

occasion to remark, that those vegetable substances in which gluten exists in the largest proportions are precisely those which are the most nutritious (and in animal substances nitrogen abounds).* Thus Davy found in 1000 parts of Middlesex wheat 190 parts of gluten; and in the same quantity of spring wheat, 240 parts; but in blighted wheat only 32 parts; in mildewed wheat, however, 130 parts; in Polish wheat 200 parts, in two varieties of Sicilian wheat 230 and 239 parts, in barley 60 parts, oats 87, rye 109, common bean 103, peas 35, potatoes from 30 to 40, linseed cake 17, Swedish turnips 2, and common turnips only 1 part. M. Vogel detected in the wheat of Bavaria 240 parts; and Boussingault found in the wheat grown in the Jardin des Plantes 270 parts, but in winter wheat only 33 parts.

The farmer must not conclude that nitrogen is found only in peculiar plants. In the examinations of M. Boussingault (*Jour. Ag. Soc.*, vol. iii., p. 150) 100,000 parts, by weight, of

	Parts.
Wheat, contained of nitrogen.	238
Wheat straw	30
Barley	202
Barley straw	26
Beans	513
Peas	408
Lucern, when green	30
Do., when dry	166
Red clover, when green	176
Do., when dry	277
Beet roots, dried	270
Do., fresh gathered	26
Cabbage or rape plants, dried	550
Oats	222
Oat straw	36
Rye	229
Rye straw	20
Potatoes	180
Turnips, fresh gathered	17
Do., when dry	220
Carrot roots, dried in the air.	240
Do., when fresh gathered	30
Buckwheat seeds	240
Meadow catstail, green	106
Rye grass	106

nitrogen 24 parts, and hydrogen 76 parts. The following is the composition of its chief salts:—

	Acid.	Ammonia.	Water.
Sulphate	54·66	14·24	31·10
Carbonate	45	43	12
Muriate	49·55	31·95	18·50

* “The quantity of food,” says Liebig, “which animals take for their nourishment, diminishes or increases in the same proportion, as it contains more or less of the substances containing nitrogen. A horse may be kept alive by feeding it with potatoes which contain a very small quantity of nitrogen; but life thus supported, is a gradual starvation: the animal increases in neither size nor

Mr. Robert Rigg (*Philos. Trans.* 1838, p. 395) detected in 100 parts of the

	Parts of Nitrogen.
Flour of wheat, not nearly ripe	2.9
Flour of the same kind, nearly ripe	2.3
Leaves of the wheat, not nearly ripe	3.3
Leaves of the wheat, nearly ripe	2.1
Stems of wheat, not nearly ripe	3.5
" " nearly ripe	1.3
Chaff of wheat, not nearly ripe	1.8
" " when nearly ripe	1.3
Common grass, not growing freely	4.4
" " growing very freely	5.6
Turnip, when attacked by the fly	8.0
Cabbage leaf not eaten	8.1
" " part eaten by insects	5.7
The insects themselves	14.0
Green part of a cabbage leaf	6.5
White part of the same	8.0
Tendrils of the same	5.4
Very centre part of the cabbage	4.1
Root of the same plant	5.5
Red clover stems	2.5
Leaf	4.2
Flower	3.6
Potato itself	2.9
" stem	3.1
" leaves	8.5
" apple	3.9
" corolla	3.9
" pistils	4.6
Young carrot $\frac{1}{4}$ inch in diameter	2.9
" " leaves	2.7
" " stems	1.7

(To be continued.)

It is also noticeable that Mr. Rigg found that when barley was made to vegetate in the shade, the increase in the quantity of its nitrogen was found to be nearly 50 per cent.; but when vegetating, exposed to the direct rays of the sun, that then the increase was only 30 per cent.; and he also made the observation that the more rapidly the plants vegetate, the more nitrogen they are found to contain. It is also well known to the cultivator, that plants growing in the shade have usually a deep green colour, vegetating with much luxuriance; and that certain animal manures applied to plants produce similar results, such as gelatine, oils, urine, blood, fish, &c. Now, it is noticeable that these fertilizers abound in nitrogen, which gas must be slowly evolved during their decomposition in the soil; gelatine containing 16.998, albumen 15.705, the fibrin of blood 19.934, urea 46.66 per cent. (*Farmers' Encyclopaedia*).

From these few facts, the farmer will readily perceive how important are the uses of nitrogen in the fertilizers he applies to his lands, a very valuable knowledge acquired only from the laborious experiments of the chemist. It is needless to examine nitrogen in its other combinations, such as with oxygen in the atmospheric gases, and with the same gas in nitric acid; for those in which it exists in the plants he cultivates and the manures he employs, are facts far more than sufficient to excite with the farmer's thirst for scientific information, his curiosity, and his gratitude.

LITERARY INSTRUCTION AND RURAL LABOUR.

TO THE EDITOR.

SIR,—In your number of last October you inserted for me a letter, in which I endeavoured to develop some of the advantages that would arise to society from establishing schools in which were carried on literary instruction and rural labour. Since, I have been turning the scheme in my mind; and it certainly does not acquire less importance from investigation. I will repeat that by spade-husbandry persons have been able to live

strength, and sinks under every exertion. The quantity of rice which an Indian eats astonishes the European; but the fact that rice contains less nitrogen than any other kind of grain at once explains the circumstance." (*Organic Chemistry*, p. 83.)

and thrive on small takings of land, as it seems they do in Flanders. Then there can be no question that a schoolmaster might find the advantage of giving literary instruction for a given portion of the day to his scholars, on his receiving their labour for the remainder; for the labour of thirty or forty boys, with good tools, and judiciously directed, were it merely for one hour daily, would be of no trifling amount of value during the year. This position as to its great importance may not be clear to all persons; I beg therefore to refer them to the "Farmers' Almanac" for 1845, where it is shown that one master maintains six persons on three acres of land, another seven persons on five acres, another nine persons on five acres, and pay-

ing rent, but receiving only the nominal money of one penny from each scholar, and their labour for a given time; that surely the British Government could not do better, for the general instruction of the country portion of the people, than to convert some of the schools into joint literary instruction and rural labour schools, which might include gardening and other branches of rural economy. And besides, the plan would enable them to do with less expenditure of public money for the new schools that might be wanted; for it appears that they might be nearly, if not entirely, self-supporting institutions. And such schools would be the means of teaching the way small takings of land should be farmed so that the greatest advantage might be derived from them, and which method, it seems, requires that the farmer should have a comfortable dwelling for himself, and good houses for his stock, with tanks to hold liquid manure and water, and other necessary appendages of civilized life that would require the aid of the carpenter and mason. Then he would have to raise on his small taking many of the varied green and white crops which a large farmer does; and of course he would have to partake of some of them, instead of living on one production, and that one which must be consumed within the year, which, it is to be regretted, is too much the case in Ireland, so that the development of the plan is particularly called for in that country. I do not know whether the new Inclosure Act extends to that country; but it might be well if some member of Parliament would see that there was a power obtained to appropriate portions of the waste land in the parishes where they may lie for joint rural labour and literary instruction schools. Then, could the school-rooms of such institutions be applied for transacting the business of the country benefit clubs, the saving to their funds would be very great. The charge which each member of a club in this neighbourhood is at is two-pence monthly, to be consumed for ale for the benefit of the publican, and a dinner that costs two shillings or more, which makes the annual expense full four shillings; but were three-pence saved monthly for five hundred thousand members, which are only half the number in the kingdom, their funds would be annually improved by the great sum of seventy-five thousand pounds, besides escaping the acknowledged evil of meeting in public-houses, so that it might be well that public attention were called to the subject.

We hear nothing of an experimental farm and agricultural museum being established in the neighbourhood of London. The Zoological Garden, which attracts such numbers, is, I believe, a joint-stock concern; and why could not an experimental farm and museum be set on foot in the

same way? Or could not a spirited farmer, who held three or four hundred acres of land in the neighbourhood of London, convert it into an exhibition farm, and render it profitable to himself and beneficial to the country. Some of the means he would have to render it attractive and useful to the country would be to have a museum there; then a dairy with its appurtenances, built on the best principles, would have great attractions among the Londoners. Then the farmer might allow the Royal Agricultural Society of England to carry out any experiments there, or to place there any production or machinery they might think worth exhibiting; and it is likely the makers of agricultural implements would avail themselves of such an opportunity of bringing their implements before the public, and where they might be tried. Had we such a farm, what opportunities it might have afforded of communicating to the public what occurred respecting the potato malady, and to show practically what was thought the best manner of treating them; and we might have lectures as well. By the bye, there seems to me that much food is wasted if persons throw away generally the damaged potatoes, as I have seen done. Now, as the frost probably will not act upon them as on the good potatoes, and as they will be found on fields and gardens for some time, would it not be well if some of our great societies could devise a means to purchase the damaged potatoes at a low price all over the country, and have them converted into starch, or render them fit for stock. I lately stove-dried potatoes that would have been thrown away. They certainly would be good for stock, and, in case of urgent necessity, for human food; and I beg to remark, I do not consider that method of rendering the damaged potato available for food sufficiently tried and attended to, to do it justice. The boiling them in two waters may be an useful method of treating them, as has been stated.

Perhaps it may not be out of place here to suggest that an official, as a conservator of the public health, is much wanted in parishes, having power to notice and remove nuisances. Of course he would have to look to lanes, courts, and gutters, as well as that the public roads were not covered with puddle, which must interfere much with the comfort, if not the health, of small towns, and is a reflection on our civilization. Then it may be observed that society would be benefited by such an official in more ways than one; for the manure would go a great way to pay the men that did the work, and it would enable the farmers to increase the agricultural produce of the country.

I am, sir, your obedient servant,

CADOGAN WILLIAMS,

Bridgend, Dec., 1845.

CULTURE OF INDIAN CORN.

ZEA MAYS—OF THE NATURAL ORDER OF GRASSES.

BY J. TOWERS.

It is also called maize and Turkey corn. The male and female flowers are apart on the same plant (hence, are *monœcious*). The male blossoms are produced in elegant, loose, wavy spikes, at the summits of the stems; some cream colour, in other varieties with a tint of red; the stamens are three in number; the calyx is a two flowered glume or husk, without horn, as is also the corolla. The fertile flowers are produced from a compound sheath arising from the bosoms of the leaves, deep-set in their axils; they are two, three, or more in number on each plant. The germens are closely arranged in upright or spiral ranks, firmly embedded in a rather conic pyramidal receptacle, which is termed the *cob*.

Thus much is required to convey some idea of the botanical character of this truly interesting and beautiful plant; and as it as lately been again spoken of, and noticed as worthy of attention, I am impelled to take up a subject with which I am familiar, in consequence of cultivating the plant extensively during several consecutive years, and having also written two practical articles upon it, one for each edition of the "Domestic Gardener's Manual."

When the late Mr. Cobbett first announced *that small variety*, which assumed the name of "Cobbett's Corn," multitudes purchased his packets in the hope of being able to acclimatize it upon the farm. In nine instances out of ten such persons failed. I was perfectly aware that poultry preferred this grain, and threw most rapidly upon it; and therefore introduced it to the garden, where it prospered summer after summer, and so improved by culture that, whereas the poor little spikes first purchased contained barely one-hundred seeds, my specimens, three or four of which were often borne by one plant, frequently comprised ten ranks, with from twenty to thirty seeds in each. Dwarf Indian corn, therefore, could, and can be, improved by culture.

As the question, after a lapse of twelve years, has been again started, and the season of the year is somewhat favourable to the setting apart and preparation of an experimental plot; as also we cannot err in bringing every appliance to bear, at a period of solicitude, I think it advisable to adduce so much of my own experience as may enable those who are interested in the attempt, to make trial of a method which cannot mislead.

But where is the variety to be *now* procured? For though, as my "Diary" instructs—"In very hot summers, like those of 1825-26, the variety known as the 'early yellow' might be made to ripen." Yet "I am satisfied that in wet seasons, the dwarf (Cobbett's dwarf) is the only one which will bring one single ear to perfection."

In Jersey, Guernsey, the Isle of Wight, and on the south coast, to Cornwall inclusive, the success would be more complete; but beyond the 52nd parallel, the crop would be very frequently in peril.

I acquired my early experience on the borders of Wiltshire, between Warminster and Frome, during the wet and windy summer of 1829. Subsequently, the dwarf corn alone was cultivated for five years in succession on my present property, and invariably with success. There are sub-varieties of the hardy dwarf, some with deep brown seeds. I hybridized three of these, and produced ears of very superior quality, and therefore I can confidently recommend the following mode of treatment.

1. Select the best and softest loam of the garden, that will, if chemically analyzed, respond to all the tests required to show the presence, in fair proportions, of the four staple earths, *i. e.*, fine *silex* (not harsh gravel-grit), *aluminous earth*, *chalk*, and *per oxide of iron*, with portions of phosphate of lime, saline compounds of potass, and soda, a little *humus*, and organic acids. Such a soil—and it is very common—is always fertile if duly tilled and enriched according to the crop; and to none is it more propitious than to maize, particularly if the site be open, and fully exposed to the sun.

At any favourable period of the rising year, make trenches three or four feet asunder, as for celery, taking out six inches of the earth, digging into the trench a good three-inch layer of rotten manure. Let the trenches point south and north, or nearly so as possible, and leave the work to settle till the last week of April, or the beginning of May; being guided herein by the warm and dry state of the weather, because a cold rainy season would be just as inimical to Indian corn as to kidney beans.

Presuming that the 1st of May will be the period, at that time fill the trenches with fine soil to within three inches of the previous level. Strain the garden-line, and dot in three seeds in a triangle, five or six inches apart, at every foot throughout the length of the rows. Cover them with an inch of earth, and pat it firmly on the

seeds. If the weather become very dry, it will be advisable to soak the soil with water two or three times, till the plants germinate, and to cover the trenches with mats or boards during the heat of the sun.

Most of the seeds will rise, but they are liable to accidents, and are often devoured; and as every foot should contain one plant at least, the precaution should be taken to sow some dozens of single seeds in small pots, keeping these under glass, so that a blank may always be filled up when it has become evident that the seeds sown are gone.

When growth shall appear to be fully established, and the plants stand at regular distances, a light hoeing must be made along the trenches; and at the same time the practice of the Peruvians may be safely imitated, particularly in dry seasons, by forming a small ring or basin round the stem of each, sprinkling a very little pure guano in the cavity, so as not to touch the stem, *flooding the ground about it with water.*

2. After a time, as the plants attain a foot in height, three inches of the earth removed first from the trenches should be returned into them, so as nearly to level the ground. In a short time, the remaining earth should be brought against the stems, to support them from the force of high wind.

3. When the male spikes shall be formed at the summits, it will be beneficial to cover the surface between the rows with an inch of manure, or to sprinkle a little more guano on the ground, always remembering that one shovel-full of that wonderful substance, *if really good*, contains more than the equivalent of a large barrow-load of common manure, in phosphates, ammoniacal, and alkaline salts, besides the uric and azotized organic substances which are almost peculiar to it.

Whatever be the dress, it should be pointed in with the fork, being careful not to injure the roots and stems. This manuring will supply nutriment, and cause the foliage to assume a dark, rich verdure, which it will retain during the hottest and driest season.

Cobbett taught the necessity and efficacy of digging and forking. He was a great admirer of Tull, and, like him, believed that tillage and pulverization would go far to obviate the need of manuring. That tillage will induce chemical action between inorganic and organic decomposable matters in the ground, the agricultural chemist is well assured; but he is equally sure that appropriate manures must be, from time to time, introduced otherwise a fodder or corn-plant, be it what it may, cannot thrive in luxuriance.

When the farina from the male spikes shall cease to be discharged, the plants can safely be cut

back to within two leaves of the upper ear, and the corn will equally advance to maturity.

Our experience of five years proves that, as an average, October is the harvest month. The plants begin to ripen by losing colour, assuming a pale brown tint, and then the seeds acquire their perfect glossy yellow cream-colour, or pale brown. Birds are voraciously fond of the seed, and will penetrate or turn aside the complicated husks till they reach the cob: therefore, it is desirable to pull off every one as it becomes ripe.

Whether or not Indian corn can ever be profitably introduced to the farm, is somewhat questionable. The chief objection arises from the lateness of the ripening season, which prevents the simultaneous ripening of the ears. The farmer will find in the above directions wherewithal to undertake an experiment in some open plot either of field or garden; and it is well to try all things. At all events, the grain is truly valuable, is an excellent pabulum for turkeys and barn-door fowls, and forms good bread with wheat-flour. Even if imported in quantity, it might be found a cheap and wholesome adjunct to the farm establishment.

We are rejoiced to be enabled to state that the subject of "tenant rights" is not only exciting much interest, but has already obtained the approval of a gentleman whose opinions in favour of the system will go far to promote its successful establishment. At the Smithfield Club dinner—

"Mr. Pusey, M.P., urged the importance of a good understanding between landlord and tenant, the perfect equity of making reasonable compensation to all outgoing tenants for the improvements which they might have made, and the justice of supplying the farmer, if not with money, at least with entire security against loss. He was at present engaged with a surveyor in preparing a new plan of agreement, which he intended to submit to his tenantry, and by which he expected very much to promote their advantage, which in the long run would be supporting his own. The chairman also strenuously recommended the practice of making leases and of granting compensation to outgoing tenants."

COATES'S HERD BOOK.—The breeders and admirers of Short-Horned Cattle will be pleased to hear that, for meeting the repeatedly urged desire for a new edition of the above work, Mr. H. Stafford (the owner of the copyright) has now in the press, and nearly ready for publication, a revised edition of the Herd Book. Gentlemen having lists of pedigrees which have not yet been entered would materially assist the compiler in his labours, as well as benefit themselves and the public, by furnishing such information to him as early as possible, for a continuation of this useful work. We refer our readers to the advertisement in another column for further particulars.

ON THE IMPORTANCE OF SYSTEM
AND METHODICAL ARRANGEMENT IN FARMING.

BY J. SPROULE.

The prevailing want of methodical arrangement either in the succession of crops or in the operations of the farm, as well as the slovenly manner in which the latter are generally executed, is apparent to every observer. Talk to the great mass of farmers of the importance of system and neatness in their operations, and they will generally assent to the propriety of your observations; though perhaps in each individual case there are so many drawbacks and difficulties to be surmounted, that he is not able to manage things as he would wish, when, in fact, no exertions are made to effect such very desirable results. Part of this apathy may proceed from not turning the attention to such *trifling objects*; but if from the perusal of this paper some of the class of persons for whom these remarks are intended can be influenced with a proper idea of their importance, the object of the writer will be accomplished.

It has been truly remarked that no other portion of the community are so much averse to the introduction of anything new as the cultivators of the soil: but in nothing are they more deficient than in the habit of accurate observation, which is of the utmost importance in every department of industry. It is no uncommon thing for a person to see a thing done a dozen of times, and not be able to do it again, though it may be even some of the common operations of the farm, requiring neither much skill to plan nor dexterous manipulation to execute; and all this proceeding from inattention, by which an indistinct impression is left on the mind.

The proper arrangement of the crops of the season is of the first importance to the farmer, though in general the crop which is to occupy any particular field is not decided on until perhaps the period nearly arrives for putting it in the ground. A person unacquainted with rural affairs could scarcely suppose that this could be the case; the farmer, however, knowing the character of his different fields, should have his arrangement of crops for the ensuing season made out while the preceding crop is still growing, and he will thus have the advantage of a whole season to test the propriety of his arrangement. Should he, from further observation, see cause to change any part of his plan, it will be maturely done, and at a time when the change will not be productive of any in-

convenience, instead of thinking of it when too late. In arranging his crops, the principles of a rotation of cropping, now so well understood, should be kept steadily in view, observing to make the different kinds of crops alternate with each other. Where a variety of crops is cultivated, there is in general sufficient time to attend properly to all; but when the produce of the farm is chiefly spring corn, or any other crop, all is bustle and confusion at the period of the sowing of the crop in such a case, the process being often delayed until the proper time for performing it has passed, while there is almost nothing to do at other periods of the season. For this reason, therefore, crops which are to be sown in the autumn are deserving of attention, and should be combined with spring crops, as thereby more regularly apportioning the farm labour throughout the different periods of the year.

An important object in the arrangement of labour is to perform such operations as are not dependant on season, at a time when the other operations of the farm are at a stand. Thus, during the frosts of winter, manure is advantageously conveyed to the fields, and there formed into heaps, in which it is to remain until it is to be applied to the land. The roads through the farm will at this time be little injured by traffic on them; and when the season of active labour arrives in the spring, this arrangement will be found to facilitate the putting down of the crops in a material degree. In like manner the land intended for green crops should be ploughed early in the winter, that not being a period of active labour; and the land is, besides, materially benefited by exposure to the atmosphere through the winter, as may be observed in spring when it is to be harrowed, that ploughed early in the season being much more easily pulverized, and as a consequence more easily cleared of root-weeds. The necessary preparations for the harvesting of the grain should also not be deferred until the necessary hurry of the harvest has arrived. Stacks for stacks may require repairs, and this should be done before hand, so that no interruption may take place when the grain is ready to be carried in. The harvest carts and waggons, too, should undergo inspection for a similar purpose before the time arrives when they will be required.

The thrashing and winnowing of the grain are

important operations to the farmer, no matter on what extent of land; and it is proper that in their execution they should interfere as little as possible with the other operations of the farm. For this purpose it may be proper, especially on the smaller sized farms, to put a quantity of unthrashed grain into the barn so soon as the last thrashing is disposed of; and in the event of wet weather setting in, which would prevent the usual out-door operations, thrashing can go on; thus affording constant employment for the men and horses, and preventing the thrashing of the corn from interfering with other farm work. When thrashing machinery is driven by water, the same precaution may be necessary, so that advantage may be taken of the increased supply obtained in wet weather. Similar remarks are applicable regarding the making of mats, baskets, and brooms, or such of these as are made on the farm. These latter, indeed, it might appear superfluous to notice, were it not the fact that they are so generally neglected. It is not at all uncommon to see these minor though useful articles to be provided just when they are wanted; and, whatever may be the urgency of the occasion, affairs must remain at a stand until they are obtained. It may be here remarked that the manufacture of such small matters might often be carried on in the farm where they are at present provided from extraneous sources. Some of the farm labourers would be much better employed in making baskets, or similar articles, on wet days than be discharged by the farmer, and spend their time in the ale-house. No doubt can, in fact, be entertained that a little additional attention to what may be termed the minor details of farm management would not fail to be the means of procuring an increased quantity of profitable employment to the labouring classes, which in many districts of the country is so very important an object.

In the arrangement of the operations of the farm-yard during the winter, when the store cattle are confined to their yards, the utmost attention to the regularity of their performance is essential. The animals of the different kinds are to be supplied with their food at fixed intervals of time. Perfect quietude is known to be one of the conditions necessary to facilitate the accumulation of flesh, and there is no more effectual way of securing this than by feeding at stated hours; the animals, from habit, soon become accustomed to the hour of feeding, and become uneasy when not supplied with their food when it arrives. The effect of such irregularity not being at the time apparent, its importance is the less felt, but it is not on that account less inimical to the growth of the animals. This is pre-eminently one of the departments of rural economy in which attention to small matters

is of most importance, and in which it is perhaps least regarded. If the farmer for a moment considered the care which a merchant will exercise to prevent any depreciation in the value of the stock, whatever it may be, which he has on hand, he would surely not be so careless in the maintenance of his. Whenever, through mismanagement of any kind, a due return is not made for the food consumed, it must be recollected that a direct loss is sustained; growing or fattening animals should never be a day stationary, as in such a case the food which is thus consumed may be regarded as so much thrown away. A further advantage is secured by performing the operations at a fixed time, as intervals will then frequently occur between the different meals, during which the attendants will have leisure to do sundry other matters in the farm-yard essential to neatness and cleanliness; while under different management they are always in a hurry with their work, and never done. This remark indeed applies to work of every description; those who do not practise habits of order and regularity being proverbially in a bustle, everything they do being done out of season, as well as imperfectly performed. When workmen of any kind are aware that they must have their operations performed at a fixed hour, on penalty of being discharged for their neglect, they usually make previous preparations to effect that purpose.

A very common cause of irregularity and loss of time is usually occasioned by neglecting to have broken implements repaired, and such additional ones procured as the case may require, until they are actually required for use. A labourer is frequently working under the disadvantage of using a mattock or crowbar, the point of which is worn off by use; or a ploughman working with plough-irons which require sharpening. In either case a direct loss is to a greater or less extent sustained, inasmuch as the workman in the one case, and the horses in the other, are subjected to an unnecessary amount of exertion in the performance of their work; whereas with a little attention the evil is easily remedied. It should indeed be observed as a rule to be invariably practised, that, in any case, a broken implement should not be laid aside without having it repaired, even should there be no further call for it during the season. When everything is kept in proper order, no loss of time is sustained in commencing an operation, or in changing from one thing to another. Both in seed time and harvest it is frequently necessary, in taking advantage of any change of weather, to go from one kind of work to another several times during the day, which, as usually managed, is often a fruitful source of annoyance and loss of time. In the spring, especially on the smaller class of farms on which

the different kinds of work cannot be carried simultaneously forward, it is necessary to change men and horses from the ploughs to the harrows, and *vice versa*; and in the autumn a still greater diversity of labour is often to be performed in a short time. In each of these cases, however, little time may be lost if the necessary articles are always at hand, and in proper order. Generally speaking, the plan for the entire day's proceedings should be made out and attentively considered in the morning, and such additional implements taken to the fields, before commencing work, as are likely to be required during the day, instead of sending for each as it may be required.

Circumstances may indeed occur during the day which it was impossible to have foreseen; but the loss of time occasioned by such means is trifling, compared with that proceeding from general inattention.

Some of the preceding remarks may seem to relate to circumstances too trivial in their nature to demand so much attention; but it is to be remembered that it is by attention to minutiae in farming, as in everything else, that success is to be expected. When small matters are properly attended to, it may be regarded as certain that the more important affairs are not likely to be neglected.

DR. BUCKLAND ON SUBSTITUTES FOR POTATOES.

The following extract from a paper "On the Origin and Extent of the Prevailing Potato Disease, and on its effects and Remedies," read by Dr. Buckland, a few days ago, before the members of the Ashmolean Society, Oxford, cannot fail to be interesting to a large portion of our readers:—

"Liebig has shown, in his *Organic Chemistry*, that it is one function of the vegetable kingdom to prepare the elements of flesh and blood for the use of the animals. That carbon or charcoal, which is indispensable to the act of breathing, but contributes little to muscle or bone, abounds in potatoes, rice, sago, and sugar, brandy and beer; while the cereal grains of wheat, barley, rye, and oats, and seeds of leguminous plants, especially peas and beans, are loaded with the constituents of muscle and bone, ready prepared to form and maintain the muscular fibre of the body of animals, *e. g.* gluten, phosphorus, lime, magnesia, sulphur, &c. Hence the rapid restoration of the shrunk muscle of the exhausted post-horse by a good feed of oats and beans. Hence the sturdy growth of the Scotch children on oat-cake and porridge, and of broth made of the meal of parched or kiln-dried peas: on this a man can live, and do good work, for 1½ d. a day; while the children of the rich, who are pampered on the finest wheat flour (without the pollard or bran), and on sago, rice, butter, and sugar, become fat and sleek, and would often die, as sometimes they do, from such non-nutritious food, but for the mixture of milk and eggs they eat in cakes and puddings. The best biscuits for children have an admixture of burnt bones, and the flour of bones is often mixed by bakers with that of wheat in bread, and (bating the fraud) the bread is better and more strengthening than if made entirely of wheat. Potatoes contain but little nutriment in proportion to their bulk: they are chiefly made of water and charcoal. Thus an Irishman, living exclusively on potatoes, and eating daily eight pounds, would get more nourishment and strength from two pounds of wheat brown bread (not white), or

two pounds of oatmeal, and from less than two pounds of peas or beans; and as about six potatoes of middling size go to a pound, an Irishman will eat daily 48 potatoes, and a family of seven 336 potatoes.

"Before potatoes were known, the food of the poorest English peasantry and of soldiers was barley-bread and peas. Sir W. Bethham has found in Dublin, records of a vessel that was wrecked in the 15th century near Liverpool, loaded with peas from Ireland for the army in England. In Hollinshed's *Chronicle* we read this passage:—'A large mouth in mine opinion, and not to eat peasen with ladies of my time.' Peas were then the food of ladies, and also of monasteries. Friar Tuck laid before his prince, as his first dish, parched peas. An old labourer at Axbridge complained to his master, Mr. Symons (who died in 1844), that labourers feeding now on potatoes could not do so good a day's work now as when he was young, and when they fed on peas. 'Peas, Sir,' said he, 'stick to the ribs.' He uttered the very truths of organic chemistry.

"In beans we have vegetable 'caseine,' or the peculiar element of cheese. What is more restorative or more grateful to man, when fatigued by labour or a long walk? As we heat or toast it, it melts, and, ere it reaches our mouth, is drawn into strings of almost ready-made fibre; and who has ever dined so fully as not to have room left for a little bit of cheese?

"Economic farmers should feed their growing, but not their fattening hogs, on beans, and finish them with barley-meal; their flesh is hard, and the fat not solid, and dissolves in boiling, if fed to the last on beans.

"What is so restorative as beans to the jaded hack or the exhausted race-horse? Sepoys on long voyages live exclusively on peas. The working and healthy man and beast want muscle, and want not fat; fat encumbers and impedes activity, and every excess of it is disease. We seldom see a fat labourer or a fat soldier, except

among the sergeants, who sometimes eat or drink too much.

“Charcoal, which, next to water, forms the chief ingredient in potatoes, is subsidiary to life, though not to strength. The same is true of the charcoal, which is the main ingredient of rice, sago, sugar, butter, and fat. The woman at Tutbury, who pretended to fast for many days and weeks, sustained life by secretly sucking handkerchiefs charged with sugar or starch. During the manufacturers' distress in Lancashire, five years ago, many of the poor remained in bed covered with blankets, where warmth and the absence of exercise lessened materially the need of food. When Sir John Franklin and his polar party travelled on snow nearly a fortnight without food, they felt no pain of hunger after the second day: they became lean and weak by severe exercise and cold, but sustained life by drinking warm water, and sleeping in blankets with their feet round a fire; alas, a knowledge of such facts may become needful and useful in the approaching winter.

“I will now consider the best substitutes for at least one-third of the potato crop, which has already perished all over Europe, and this in Ireland is the loss of the only winter food of 2,000,000 of the people. In times of scarcity, man must take unusual trouble and adopt unusual expedients. Happily this year the crop of turnips is large and good, and already in Hampshire farmers are selling turnips to the poor at a moderate price. This, if done generally, will form one kind of substitute for the lost potatoes. Field carrots and parsnips and mangel-wurzel, which have been grown for sheep and cattle, may be also reserved for boiling, and if sold at the usual price of potatoes, will supply more nourishment than an equal weight thereof. I shall not plead in vain to the farmers of England for this boon and benefit to their poor neighbours, who may otherwise be distressed for food and suffer hunger. Oil-cake will do as well or better for the sheep, and may be bought with the price of the above roots.

“It has been already stated that the most nutritious of all vegetable food is the flour of peas, which was the staple food in Europe before potatoes. The flour of kiln-dried peas stirred in hot water makes a strong and pleasant Scotch brose, on which alone a man may do good work. Barrels of peas brose flour may be brought from Scotland, or prepared in England wherever there is a malt-kiln.

“In England, pea-soup and peas-pudding are still a common and most nourishing food. Our forefathers and their children we know from nursery rhymes, ate

‘Peas pudding hot, peas pudding cold,

‘Peas pudding in the pot, and nine days old.’

“Let us for a part of this and next year once live as they lived 300 years ago. Boiled or fried slices of peas-

pudding are not unsavoury food; and what boy would not prefer parched peas to nuts?

“Let every labourer who can get them lay up a sack or two of peas, and he will be safe. Where peas cannot be had, let him lay in a sack or two of beans; their flour is as nutritious as that of peas, and has no bad taste; bakers mix it with bread, and we taste it not; mixed with meal of wheat, barley, or oats, it makes good cakes and puddings, and strong soup or broth. All over the world, excepting England, both the rich and poor rarely dine without a dish of beans, sometimes their only dish. Let resident proprietors and chief farmers in each village lay in a stock of peas and beans, and sell them to the poor three or four months hence, at their present cost. Let them also reserve for their labourers, at present prices, some good barley and good oats, to be ground into meal next spring, when food will be most scarce.

“Barley bread or cakes alone are not good for working men—they are too heating; but mixed with other flour, or eaten with other kinds of food, barley is very nourishing.

“Oat cake is the bread of all Scotland, and of much of Ireland, and of the North of England; and oatmeal made into broth and porridge is the universal and almost the only food of Highland children. Let those who have quailed under the charge of a Highland regiment tell the results.

“Bread made of rye is the chief food of farmers and labourers in Germany and the north of Europe; it is of a dark colour, and little used with us, but it is very nourishing, and in a time of scarcity is a good substitute for wheat.

“Indian corn or maize is the food of man over a large part of the world, and makes bread and cakes; not very palatable to us, but better than nothing in times of scarcity.

“Rice and sago eaten alone may suffice for persons who take little exercise, for women and children, but not for working men. These and potato flour may be added to give bulk to the more nutritious kinds of meal above mentioned.

“Lastly, let every poor man get his garden vegetables as forward as possible next spring. Let him plant his potatoes early, and when the ground is dry; let the sets be entire, or if cut, let the pieces be shaken in a sieve of quick-lime before planting. Before to-morrow's sun has set let every man bestir himself, and take a little extra trouble in the next week, that he and his children may not suffer hunger in the next year. Let no man shut his eyes and fold his arms, and say there is no danger; but let one and all arise to-morrow, and put their shoulders to the wheel. The blessing of Providence will help, and rest on those who may help themselves. ‘Up and be doing, and God will prosper.’”

STATE OF THE HARVEST, AND ESPECIALLY THE POTATO CROP.

SIR,—As a very considerable anxiety has for some time prevailed throughout the country regarding the state of the crops generally, and of the potato crop in particular, and having had very considerable experience as a practical farmer, and having been for many years used to go through the various parts of the country to enable me to form an opinion on the state of the crops, I hope I may be permitted to give my opinion to the public, in the hope that I shall be able in some degree to moderate the panic which is now so unnecessarily raging.

Towards the middle of September I went down the Tweed from Peebles, which I followed to Berwick, diverging occasionally to the right and left, and found harvest just commencing—barley uniformly ripe, potato oats within a week of being ripe, but wheat backward; potatoes a very moderate crop; early turnips, where the land was well drained, a splendid crop; the pasture grass overflowing, and the hay a great crop, although not well made. The same remarks apply to Berwickshire; and I do not know if, of the very frequent times that I have travelled that road, I ever saw the country looking so rich. The oats and barley were superb, and the wheat seemed a full average. I returned home through East Lothian, by Dunbar and Haddington, and there the crops were everything that the most fastidious farmer could desire. I may, however, add, that the potato crop generally never showed vigour almost anywhere. Shortly after, on the 27th September, I went up to London, where I remained a week, and returned home through the centre of England, where I found the crops all ripe, but very little north of Birmingham harvested; the crops seemed as good as usual. I have travelled that road very frequently during a period of forty years, and I regret to say that I perceive little or no improvement. I afterwards went through Ayrshire, Lanarkshire, Peebleshire, and Dumfries-shire, and West and Mid-Lothian, and the conclusion which I came to was that, taking all the crops together, including potatoes, there is a very full average crop in the country.

It is true that the long tract of wet weather which has prevailed has injured the colour and caused the grain to weigh less, but not to any extent to do harm, the weather being cold prevented sprouting.

I shall now proceed to lay before you the produce of my own farm, so far as I have thrashed. In autumn last I sowed a field of 20 Scotch acres of wheat, after beans; it was all mown. I have only thrashed a part of it, but have accurately measured the part I thrashed: I find the produce to be 52 bushels per acre, weighing 61lbs. per bushel; the rest of the field I consider will be a good deal better.

About the end of September I thrashed a considerable quantity of potato oats. They were a very great bulk, and no one could expect that the produce would correspond with the bulk; but upon measuring the ground I found the yield to be 11 2-8th quarters, or 90 bushels

per acre, weighing 42lbs. per bushel, and with a very large and valuable produce of straw. I have not thrashed any barley yet, but I have a very bulky crop. My peas and beans are a very great crop. I have still 15 acres in the field, which are ready to be taken in as soon as they are dry.

In order to confirm my own opinion, I applied to a very intelligent farmer in my own immediate neighbourhood, and he writes me that he has thrashed out the whole of a 14-acre field of oats, excepting one stack, which he has kept for seed, and he finds the produce a little above 15 bolls per Scotch acre, or 90 bushels. "Of wheat I have thrashed so little, that I can say nothing as to the yield; but the quality is good. I have thrashed no barley. As to potatoes, I lifted and sold a six-acre field early; the produce was only twenty-seven bolls per acre, without the small; but," he adds, "the rest of my potatoes are better, but by no means a great crop; however, I am happy to say they are of excellent quality, and keeping well." Such is the opinion of a most intelligent agriculturist; and, indeed, every farmer whom I have conversed with is nearly of the same opinion. As to my own potatoes, I have already lifted upwards of 600 bolls of 4 cwt. each; the quality is much superior to the average of years. They are not yet all lifted, but my overseer calculates that they will be 50 bolls per Scotch acre of 4 cwt. each. I have numerous correspondents both in England and Scotland, but not one has talked either of scarcity or famine. One which I received yesterday, an annual circular from Mr. Benjamin Dowson, Great Yarmouth, a very eminent and extensive shipper of corn of long standing, sums up the account of the crops:—"Of wheat the yield I expect will be over an average, though the weight will be 2lbs. deficient. As to barley, the yield, I expect, will be over an average. Maple and white peas, great crops; and beans promise an abundant crop, and if they are well secured, no doubt they will be much over an average growth."

I do not mean to say that there is not a disease among the potatoes, but, in truth, very little of it has come under my observation, and all the farmers in this neighbourhood maintain that they have not any, or next to none; but supposing there really was an extensive disease, although in many districts there is scarcely any, I will venture to say, there is no field where the disease extends to one-fourth; and although we have read in the papers that the tainted potatoes have killed "pigs and Irishmen," which I do not believe, yet at least half the potato may be made available for feeding; and as there are always a great many more planted than required for human food, I see no reason to fear that there will be any want of this valuable root. A very few years ago I was getting 12s. and 14s. per boll for my potatoes: this year I have difficulty in getting 12s.

But the great produce and fine quality of crop '44 have made us expect too much, and it is not fair to compare

this crop with the last; but comparing it with an average crop, this will not be found wanting. Let any one who takes an interest in these subjects compare the produces above stated, and I am sure they must confess they are very far beyond an average. If they have still doubts, if they will come to me, I will give them such proofs as must convince them.

There is a peculiarity in the corn panic which now seems raging. The citizens generally have been accustomed to call the farmers discontented and grumblers, but this year I have never heard a complaint from them. They have allowed the towns to do the work for them, by running up the prices very unnecessarily; but the citizens would make us believe that we are to be starved. My belief is, that the Corn-law-League is at the bottom of it, and there will be soon a corn panic as disastrous as the railway panic.

I beg you will excuse this long letter, and that you will give me a corner of your paper on Saturday. I shall send you a statement of the produce of various sorts of wheat which I have experimented on this last season, and which may be useful at this time. I am, &c.,

WILLIAM AITCHISON.

Drummore, October 29.

My overseer notices this season that the buff potatoes are producing a much greater crop than the dons.—*Courant.*

MALTING.

Much excitement has prevailed among persons concerned in the malting business, in consequence of officers of excise having lately used extra vigilance in seeking for penalties, especially in the counties of Wilts, Somerset, and Dorset. At Weyhill fair a memorial to the Board of Excise was signed by a large number of maltsters, and a deputation was appointed to seek an interview with the Commissioners, which was granted last week. The deputation were kindly received, and due attention was paid to their observations at a long conference. In addition to the memorial, a statement, bearing the signatures of Messrs. Abraham Crowley, of Alton; William Morgan and John Warren, Warminster; William Snellgrove, Heytesbury, Wilts; Joseph Oxley, Frome; G. Butler, Kennet, Wilts; and William Devenish, Weymouth, was presented to the Board, being the result of the deliberations of the deputation at a previous meeting in London, setting forth that the said laws are in some respects, both in principle and practice, repugnant to the feelings, and calculated to destroy the character of an honest trader, and, moreover, not necessary for the protection of the revenue.

As to the principle—1st. They consider it to be at variance with sound principles of justice that men of respectable character, in conducting their business, should be subjected to grievous penalties, upon the evidence of an officer of excise, who receives half the amount in case of conviction, such evidence being unsupported by any disinterested witness. 2nd. That the

character of honest men is in jeopardy, in fact, placed entirely at the mercy of labouring maltsters, whom they employ, inasmuch as they have no means of preventing them from filling a couch improperly, either from carelessness or with a design to injure their employers, or even at the instigation of a needy officer of excise. 3rd. That it appears high time to review the state of the law when magistrates, who are appointed to administer it, have in various instances felt reluctant to fine a trader even the smallest amount, viz., one-fourth part of the penalty, and have even expressed their regret that it was out of their power to remit the whole, being satisfied that no moral guilt attached to him. 4th. That to receive the sympathy of a magistrate is but a cruel satisfaction to honest men, who may be placed far above the temptation to commit fraud, and the infliction of a penalty for no moral crime is very unequal in its operation. It is a circumstance which may be exaggerated, affording an opportunity for malicious detraction of character by envious competitors in trade, so that many honest men would rather lose 1,000*l.* than be fined 25*l.*

As to the practice—1st. It is indisputable that experienced officers of excise differ in their gauging, and this difference may operate in the two gauges, so as to render the allowance of five per cent. in favour of the trader unavailable. 2nd. That even if this difference of gauging did not so operate, there are various other circumstances which, if they happen to combine, may render the said allowance of five per cent. an uncertain protection to an honest trader, viz., mild temperature, light condition of the grain after having been many hours in the couch, the delicate manner in which officers may re-couch the grain, far beyond what can be expected from young hands, or even experienced maltsters, in their usual and proper course of proceeding; and, in addition to all these, the officer returns the grain from a level instead of over the cistern wall, by which he is enabled to lay it lighter.

In order to remedy these defects, and duly to protect the revenue, it is most respectfully suggested—1st. That the duty be charged on a drained cistern gauge, and that the barley remain in the cistern for such period as may be considered by the Honourable Commissioners necessary for the protection of the revenue, not exceeding the whole period which it is now allowed to remain in cistern and couch together. 2nd. That any regulations or extra charges which may be necessary for the protection of the revenue be established by law. 3rd. That the barley in the cistern be under the lock of the excise for such period as they may deem proper. 4th. That the officer may continue to charge duty whenever he can find highest gauge as at present, but that a trader be liable for penalties, only when detected in the fact, and not for any assumed infringement of the law.

Full persuasion is expressed that these suggestions are reasonable, and that the fraudulent trader will have no more facility for evading the duty than at present; at the same time, any restrictions or impositions will be cheerfully submitted to, which can be clearly shown to be indispensable for the protection of the revenue; but

as it is possible that the Honourable Commissioners of Excise may not be prepared at present to unite in all the sentiments above expressed, yet it is most respectfully urged that what common justice clearly requires may be immediately granted, viz.—That no officer be permitted to have any interest in the penalties, but that they be appropriated to some charitable fund, or in aid of the poor rates, or to some other suitable purpose. That the trader be allowed some disinterested test of

the officer's gauge. That the officer be compelled to empty the couch into the cistern instead of on to the floor, in order to place him upon equal terms with the workman who filled it. That the magistrates have power to remit the whole or any part of the penalty, according to their discretion, so that they may thereby become judges as to the moral as well as the legal guilt of a trader.

LETTER FROM E. S. CAYLEY, ESQ., M.P., TO LORD JOHN RUSSELL, ON THE CORN LAWS.

DEAR LORD JOHN,—I have just read your letter to your London constituents, on the subject of the corn laws. From the interest I have so long taken in this question, I am sure you will forgive me if I venture to make some observations upon it, by way of reply. Obloquy may attach to those who still adhere to their views on this matter, but from a member of the house of Russell I can never learn the miserable lesson of yielding to clamour what cannot be conceded by conviction, or of deserting opinions long conscientiously maintained, because they support what for the moment may appear to be a falling cause.

Believing the corn-laws to have been founded on a comprehensive principle of public advantage, I should belie the faith that is in me, and be a coward to what I deem the truth, could I shrink from the avowal of it at a time especially when so many are girt for its attack, and so few for its defence. I may be wrong in my view of this great subject. If I am I hope to be corrected, and that truth will prevail. I am not so presumptuous even as to suppose that I can be entirely right in my estimation of all the bearings of so large a question. What human being ever was absolutely and perfectly right in his judgment of any one subject? I have tried to steer clear of error as far as my feeble light will permit, and if I have erred, I have erred with an honest intention. But doubting the infallibility of human powers in judging of the future, and having already seen too many instances in which, as legislators (to the subsequent cost and injury of thousands), our anticipations have been lamentably disappointed, I would, in matters where small mistakes may breed great wrongs, argue for being guided by the practical cautious lessons of history, rather than by the visions however ingenious, by the conjectures however specious, of speculation and the closet.

I repeat my belief that the corn laws are founded on public principle—that they are essentially for the public good, for the welfare, the permanent welfare, not of the few, but of the many. On no other ground could they have stood so long; on no other can they stand; on no other ground ought they to stand for a moment longer, unless with a view of gradually breaking the violence of the shock to the property embarked in the land, which so sudden a change would confiscate. And I start with

this broad affirmation, because if the landlords and farmers of England had believed the corn-laws to be injurious to the majority of their countrymen—if they had believed them to be, as some assert, laws for the starvation of the people, and not laws constituted for the lasting support of the people, and for the continuous cultivation of the land, they would never have supported them.

It is because the landlords and farmers of England—a body of men, you well know, as amenable to the charities of life, as interested in the welfare of those around them, as anxious to do their utmost to alleviate the pangs of suffering and distress they may witness, as ready to submit to personal privation when the claims of religion, humanity, or their country call for the sacrifice, as ready—to say the least—as any other body of men;—it is only because the landlords and farmers of England, as a body, are convinced that the corn laws are for the public benefit, that those laws have always received and still continue to receive their unabated support. If they had thought them injurious to the permanent welfare of the people, I cannot doubt that they would have been as ready to repeal them as yourself.

Your letter naturally divides itself into two parts: the first relating to your apprehensions of present scarcity, and to your views as to the proper legislation consequent upon such apprehension; the second part referring to your objections to the corn laws generally. I will take each part in its order.

You state that “Parliament should have been called together three weeks ago, and that no party in Parliament would have made itself responsible for the obstruction of a measure so urgent and so beneficial” as the suspension of the import duties on corn. To this it may be replied, that if no one could have opposed such a measure, an order in council would, without delay, or risk to the government, have much more speedily, and therefore much more efficiently, responded to the public wants. But what would have been the effect of the immediate suspension of the import duties? Either we could have obtained an immediate supply, or we could not. If we could not, it would have been mischievous to have opened the ports, since the importation of a large additional supply would have so lowered the price of corn, and

have led to such an increased consumption, as might have trenched injuriously on the means of supply before the next harvest.

If we could have obtained an immediate supply, an equally mischievous result might have followed; it would have equally led to immediate increase of consumption, and might equally have trenched on the ultimate means of supply; since it is notorious that, with perhaps the exception of Canada and the United States, and possibly Spain and Italy, there is as great a deficiency of wheat in the rest of the world as in England, if not a greater deficiency; and this does not appear to be a casual occurrence. Mr. Lowe, in his "State of Agriculture" (published, I think, in 1818), from a careful survey and comparison of the seasons for a number of years back, states, "that it appears that the corn-growing countries of Europe lie between 45 and 55 degrees of latitude, and are subject, in a great degree, to similar winds, rains, droughts, and frosts. There are," he says, "some remarkable instances of this. In 1794 the spring was prematurely warm on the continent, as well as in England. The summer of 1798 was dry, and that of 1790 wet, in both places. Again in 1811, the harvest was deficient throughout the north-west of Europe generally, and from the same cause—blight; while that of 1816 was still more generally deficient, from rain and want of warmth. From a coincidence of prices in the seventeenth and eighteenth centuries, it is also highly probable that similar seasons prevailed here and on the Continent, especially in 1708, 1709, and in several seasons between 1764 and 1773. When, therefore, it is proposed to leave England dependent on foreign supplies, it should be recollected that the same causes which occasion a bad harvest in England would very probably produce them in other corn countries."

These were occasions when dearths appear to have been the most general. Instances have also doubtless occurred of more partial scarcities; instances, perhaps, like those when Prussia could supply our wants; but, when we took off the duty on importation, the King of Prussia put it on at his side of the water, thus filling his exchequer at the expense of ours, without the suspension of the duty being of the slightest benefit to the English consumer. When, however, the dearth is general, we cannot be surprised that other countries, and their rulers, should prevent the exportation of corn to their neighbours, at a time when famine stares them in the face at home; nor need it astonish any one, that France, Russia, and Naples, if I remember rightly (for I have the advantage of few or no documents to refer to), have all, on various occasions, taken the precaution of first supplying themselves in a time of scarcity—a precaution which the people of those, and I believe other countries, have on such occasions not unfrequently adopted in despite of their governments, and forcibly prevented the exportation of food.

Under the apprehension of contingencies such as these it was that the late Mr. Huskisson probably formed his celebrated conclusion that the main reliance of the people of this country for a sure and permanent

supply of food should be placed on that which is grown at home.

In arguing, therefore, for an immediate suspension of the import duties, you appear to involve yourself in a contradiction, for you very justly observe in another place that "the effect of a bad harvest is, in the first place, to diminish the supply in the market, and to raise the price. Hence diminished consumption and the privation of incipient scarcity, by which the whole stock is more equally distributed over the year, and the ultimate pressure is greatly mitigated." But an immediate suspension of the import duties would produce, in all probability, an immediate letting out of bond of a million quarters of wheat; besides, before winter, causing another million quarters to be poured into the market, and thus possibly at once exhaust the foreign supply, to the great aggravation, if there be a scarcity (and if there be no scarcity, then there is still less necessity for the measure), of the deficiency before next harvest.

But the contradiction in which you appear involved in this part of the subject is infinitely increased when reference is made to what you say in relation to potatoes. "But the fear of the breaking out of this unknown disease in the potato induces the holders to hurry into the market; and thus we have at one and the same time rapid consumption and impending deficiency, scarcity of the article and cheapness of price. The ultimate suffering must thereby be rendered far more severe than it otherwise would be." I could not, if I would, make use of stronger words and stronger arguments in support of my view that an immediate suspension of the import duties would (if there be the scarcity you apprehend) greatly aggravate the public distress in the spring and summer months. If a fear is entertained that a limited supply only can be obtained from abroad, would you, in defiance of your own rule, and in the face of scarcity, let it all in at once, to add a stimulus to the consumption you so prudently deprecate?

How much more wisely, in my opinion, and as I think facts have proved and will prove, have the corn-laws provided for the permanent supply of the people, under an apprehension of scarcity. Observe what in this law (or rather in the graduated scale) you will perhaps remember my warmly contending for, in the agricultural committees of 1833 and 1836, viz., the steadiness which it promotes in prices. Take any six weeks since harvest, when the reported scarcity (if no obstructive principle had been at work, would probably have produced a variation in prices from week to week, of 5s. or 10s. per quarter, as reports vacillated of the prospects of supply, and what do you see? scarcely a variation of 2d. a bushel; but, instead of it, a steady progression in price, approximating very gradually to that point where the duty virtually ceases, and free importation begins; that point near which popular clamour is so easily excited, but at which the duty vanishes, to the instant relief of the consumers, and the mortification of those who would profit by the clamour. With these parties, this safety-valve (which after reasonably protecting the grower, proceeds at once to the reasonable protection of the consumer) has

always been the most onnoxious part of the present corn-laws; because, just as they are clutching a plausible popular cry, it eludes their grasp.

Upon what grounds, however, do you anticipate such calamitous effects from one year's apprehended scarcity? Is it from the present corn-laws? If I do not mistake, we imported last year, or the year before about 800,000 quarters of wheat at a 11s. duty. How much more may we import when the duty falls to the vanishing point? Putting the present corn law for a moment aside, turn to the effects of four deficient harvests, under a more stringent corn-law—that of 1828, of which the present is only a modification with diminished duties; turn to the deficient harvests of 1828, 1829, 1830, 1831, and see whether the anticipations of an insufficient supply—fourfold more likely, under such repeated scarcity, to be fulfilled at that time than this—were then fulfilled! Rnmour, with her busy tongue—panic, with its prostrate imbecility—were as rife then as now. And what was the result? In no four years in any period of English history, before or since, had we such large importations; a supply so commensurate with our wants, that those only who took a political interest in the question appear now to remember them; except, indeed, those poor farmers who cultivated what were then emphatically designated the wheat soils of England!—full a third of whom, in spite of the protective price afforded by the corn-law, were so inadequately compensated for their deficient crops, that with this addition to the pressure of accumulated distress, from the great fall in prices subsequent to the Money Act of 1819, they sunk to the earth, to rise no more; and had it not been for the protection then afforded by those corn-laws, the stoutest of those cultivators of the wheat soils of England must have been swept away from the face of the land. Thank God! we had still resolution enough to abide by the experience of the past, instead of the infatuation to run headlong into an unknown abyss of a new-fangled philosophy. If the higher duties of the corn law of 1828 did not, during four successive deficient harvests, prevent our obtaining a sufficient foreign supply, why should we so much dread the effects of a corn-law, with lower duties, in preventing a foreign supply sufficient to meet the deficiency of only one year?

Had the corn-laws been abolished in 1828—throwing thousands upon thousands of labourers and acres out of employment and cultivation as the consequence—under the fallacious apprehension of the effects of scarcity, I should have, indeed, trembled for the supply of food for the people in the year 1846. Nothing but the firmest conviction of the truth of Mr. Huskisson's axiom, "that on British corn must our British people mainly rely, in war and in peace, for the food they eat," gives me the confidence I feel. With gratitude to Heaven I utter it (provided our legislative vacillations, while they paralyze the future efforts of the British farmer, do not at the same time clog the well-nigh omnipotent powers of the British merchant, and of British gold), that in England at least we shall experience none of the miseries of famine. To the eaters of potatoes in Ireland (whose forlorn dependence on that lowest species of food I commiserate,

especially under present adverse circumstances, as much as you can do)—to the Irish, open ports would not give the money to purchase corn.

But what is the real truth respecting the crops in England? As yet it may not be fully ascertained; but for the comfort of those who are more apprehensive than myself, I may state that an extensive inquiry is now making, and in part made, into the state of the crops in Yorkshire; and, as far as I have seen, the following are the almost invariable answers (with certain limitations) to the queries sent:—

1. That the wheat crop, though very deficient in yield, when considered relatively to the quantity of straw, is yet believed to be little below the average of the last few years, in consequence of the large proportion of land cropped with wheat, the unprecedentedly large bulk of straw, and the unusually productive crops in many of the backward and upland districts.

2. That the deficiency of yield chiefly arises from the number of light grains which are necessarily blown out in dressing the corn for market, leaving the whole of the marketable grain, with but few exceptions, sound and wholesome; whereas in years of real scarcity, such as 1800, 1816, &c., a large proportion of the wheat crop was sprouted and unfit for use.

3. That where proper care has been taken in sorting potatoes attacked with gangrene or murrain, and in storing them in dry, cool situations, little progress appears to have been made by the disease of late; and it may, therefore, be reasonably hoped that the full extent of the evil is already known.

4. That the deficiency caused by the potato failure will be, in some measure, compensated by the unusually arge crops of oats, barley, and beans.

I am very glad to be able to add to this account (contrary to your experience) that potatoes are not generally forced into the market, but that the labourers hereabouts are generally turning their worst potatoes into bacon, in the expectation of the best keeping till spring; and I am greatly in hopes that the extra pig which they are thus enabled to feed will go, as well as the others, to the comfortable support of their families; for the demand for labour is so good, that I rejoice to say I can scarcely find an extra hand, when I want one, at half-a-crown a day—the wages, more or less, ever since I can remember, of this district. May a free trade in corn never reduce them!

I find my observations on the first part of your letter drawn out to so much greater length than I had expected, that my intended comments on the second part I most unwillingly reserve for a second letter. I will not close this, however, although it might be said more properly to belong to the second part, without expressing my satisfaction at your not joining (which, indeed, it would have been the worst injustice to have suspected you of) in the exaggerated statements so common to the opponents of the corn-laws, that they *entirely* restrict the people to the consumption of British-grown corn; and that, with an increasing population, they limit us to the comparatively stationary amount of food which the British islands can produce. But can any one, with truth,

deny that if our population were tenfold what it now is, the present corn-law would admit as much corn as could possibly be imported, whenever the duty fell to that point at which it served the merchant's interest to enter it for consumption? When the period arrives that the corn-laws do practically prevent our importing foreign corn in sufficient quantities to meet the deficiencies of home growth, then will be the just time, and not till then, to complain of their effects under an apprehension of scarcity.

The corn-laws, then, do not prohibit the importation of foreign corn. They do but prevent its being entered for consumption at a price that would ruin the English grower, and disemploy the English labourer. After that risk is passed, importation is free; and surely you should not object to this principle, who hold that so much evil may accrue from having, at one and the same time, "scarcity of the article, and cheapness of price!"

Of this, indeed, as it appears to me, it may be truly stated of the corn-law, viz., that, as between the English grower and the English consumer (leaving foreign corn out of the question), it does not in the least affect the price of corn; but that the price, under the circumstances of this mere domestic interchange, is determined, and determined alone, by the supply and the demand—*i. e.*, by the plenty or deficiency of the article, as compared with the increase or decrease of the demand; or it is determined by the plenty or scarcity of that medium called money, in which the price is measured. It is an error, therefore, to imagine that, under these circumstances of mere domestic interchange (separate from a foreign importation), the corn-law does or can raise or fix the price of corn. Its real effect is to prevent foreign competition from throwing down the natural price struck out between the domestic producer and consumer.

The question, however, is totally changed when you introduce into the question the elements of foreign competition. Just as with any other commodity, so with corn; if you bring a larger quantity into the market, you as certainly diminish its price for the time being. But if, by this competition, you drive the parties employed in producing a commodity to give up producing it, with the view of relying upon a foreign supply; if that article be one of first necessity, like corn, and there comes a period of war, or of scarcity in the foreign country or countries on which you usually rely for your supply of such article, then it may turn out that this species of competition may prove a "penny wise and pound foolish economy"—one which has given you cheap corn when you do not want it—and very dear corn—or worse than that—none at all, when you do want it.

What the English farmer wants is not scarcity or dearth. Scarcity is a curse to man and beast; plenty a blessing to both. But he wants that degree of price which, under our most artificial state, with debts, taxes, embarrassments, and entanglements innumerable, and almost out of count, will enable him to compete with those who have no such burdens to bear, or incomparably fewer. Strip him, as his foreign competitors are stripped, of these heavy weights, and, if I know the British farmer, and I think I do, he would not be afraid to

run an equal race. But fettered as he now is, he requires for his existence as a cultivator, and the great body of consumers, as I think, require for the continuous cultivation of the land, protection against prices which are unequal to repay the cost of cultivation; and the farmer also requires, as other producers do, some compensation, in an increased price for a scarcity of his commodity from a dispensation of Providence. And he considers this compensation as indispensable to the permanence of his occupation, as it is to that of all others. That scarcity and increased price should go together, he both learns from you, and believes to be one of the wise regulations of nature. If, however, you at once admit foreign corn, the moment some deficiency is apprehended in his crops, you, at the same time, deprive him of that increase of price which he thinks the natural compensation for deficiency; and you rob him of what, under our artificial system, he believes, and not unreasonably believes, to be his due.

Nor does the farmer believe that the public (unexcited by specious declamation) would ever grudge him the benefit of a law which, under low prices (when the consumer's interest is not palpably involved) protects the grower; which, under scarcity, partially compensates him for a deficient crop, and which admits foreign corn to the consumer at a price (considering scarcity) not unreasonably high. The British farmer does not think this so unreasonable a demand, that the British public—always in the end pretty just in their conclusions—should, if left to the exercise of their own independent sense of fairness, in the long run refuse it to them.

My reply to your more general observations on the corn-laws I reserve, as I said before (providing the physical strength be left me), to a second letter.

'More! do the farmers want?' do you ask? May I answer you? Yes! They now, not improbably, want, as I do, to see Lord John Russell in his old place, as leader of the House of Commons; for then they would feel that they might safely repose under the protection and consistency of her Majesty's—Opposition.

Dear Lord John, Your's very truly,

Wydale, Nov. 23.

E. S. CAYLEY.

HONOURS OF GEOLOGY.—The *St. Petersburg Gazette* of Oct. 30, contains an extract from an ukase of the senate, of Sept. 22, by which the Emperor of Russia appoints Mr. Murchison an Effective Member of the Imperial Academy of Sciences (of which he was previously an honorary member, with all the rights, privileges, and rank attached to that office in the imperial service. On the recent presentation to the Emperor, by Mr. Murchison, of the large work (in which, in conjunction with M. E. de Verneuil and Count Keyserling, he has been for five years engaged) "On the Geographical Structure of Russia in Europe and the Ural Mountains," his Imperial Majesty was pleased to confer on him the order of St. Stanislaus of the first class, and on M. de Verneuil the order of St. Vladimir of the third class. It is gratifying to see such notice taken of the united exertions of English and French geologists in such distant regions; this is, indeed, the true *entente cordiale* among civilised nations.

ALL PLANTS DO NOT FOUL THE SOIL EQUALLY.

It is said that a plant fouls the soil, when it facilitates or permits the growth of weeds, which exhaust the earth, weary the plant, appropriate to themselves a part of its nourishment, and hasten its decay. All plants not provided with an extensive system of large and vigorous leaves, calculated to cover the ground, foul the soil.

The grains, from their slender stalks rising into the air, and their long, narrow leaves, easily admit into their intervals those weeds that grow upon the surface, which, being defended from heat and winds, grow by favour of the grain they injure.

Herbaceous plants, on the contrary, which cover the surface of the soil with their leaves, and raise their stalks to only a moderate height, stifle all that endeavours to grow at their roots, and the earth remains clean. It must be observed, however, that this last is not the case unless the soil be adapted to the plants, and contain a sufficient quantity of manure to support them in a state of healthy and vigorous vegetation: it is for want of these favourable circumstances that we often see these same plants languishing, and allowing the growth of less delicate herbs, which cause them to perish before their time. Vegetables sown and cultivated in furrows, as are the various roots and the greater part of the leguminous plants, allow room for a large number of weeds; but the soil can be easily kept free by a frequent use of the hoe or weeding fork; and by this means may be preserved rich enough for raising a second crop, especially if the first be not allowed to go to seed.

The seeds that are committed to the ground often contain those of weeds amongst them, and too much care cannot be taken to avoid this: it is more frequently the case, however, that these are brought by the winds, deposited by water, or sown with the manure of the farm-yard.

The carelessness of those agriculturists who allow thistles and other hurtful plants to remain in their fields cannot be too much censured; each year these plants produce new seeds, thus exhausting the land and increasing their own numbers, till it becomes almost impossible to free the soil from them. This negligence is carried by some to such an extent, that they will reap the grain all around the thistles, and leave them standing at liberty to complete their growth and fructification. How much better it would be to cut those hurtful plants before they flower, and to add them to the manure of the farm. From the principles which I have

just established, we may draw the following conclusions.

1st. That however well prepared a soil may be, it cannot nourish a long succession of crops without becoming exhausted.

2nd. Each harvest impoverishes the soil to a certain extent, depending upon the degree of nourishment which it restores to the earth.

3rd. The cultivation of spindle roots ought to succeed that of running and superficial roots.

4th. It is necessary to avoid returning too soon to the cultivation of the same or of analogous kinds of vegetables, in the same soil.*

5th. It is very unwise to allow two kinds of plants, which admit of the ready growth of weeds among them, to be raised in succession.

6th. Those plants that derive their principal support from the soil should not be sown, excepting when the soil is sufficiently provided with manure.

7th. When the soil exhibits symptoms of exhaustion from successive harvests, the cultivation of those plants that restore most to the soil must be resorted to.

These principles are confirmed by experience; they form the basis of a system of agriculture rich in its products, but more rich in its economy, by the diminution of the usual quantity of labour and manure. All cultivators ought to be governed by them; but their application must be modified by the nature of soils and climates, and the particular wants of each locality.

To prescribe a series of successive and various harvests, without paying any regard to the difference of soils, would be to commit a great error, and to condemn the system of cropping in the eyes of those agriculturists who are too little enlightened to think of introducing into their grounds the requisite changes.

* In addition to the reasons I have given why plants of the same or analogous kinds should not be cultivated in succession upon the same soil, there is another which I will here assign. M. Olivier, member of the French Institute, has described with much care all the insects which devour the neck of the roots of grain: these multiply infinitely, if the same or analogous kinds of plants be presented to the soil for several successive years; but perish for want of food, whenever plants not suited to be food for their larvæ are made to succeed the grains. These insects belong to the family of Tipulæ, or to that of flies.—(Sixteenth Vol. of the *Memoirs of the Royal and Central Agricultural Society of Paris.*)

Clover and sainfoin are placed amongst the vegetables that ought to enter into the system of cropping; but these plants require a deep and not too compact soil, in order that their roots may fix themselves firmly.

Flax, hemp, and corn require a good soil, and can be admitted as a crop only upon those lands that are fertile and well prepared.

Light and dry soils cannot bear the same kind of crop as those that are compact and moist.

Each kind of soil, then, requires a particular system of crops, and each farmer ought to establish his own upon a perfect knowledge of the character and properties of the land he cultivates.

As in each locality the soil presents shades of difference, more or less marked, according to the exposure, composition, depth of the soil, &c., the proprietor ought so to vary his crops as to give to each portion of the land the plants for which it is best adapted, and thus establish a particular rotation of crops upon the several divisions of his estate.

The wants of the neighbourhood, the facility with which the products may be disposed of, and the comparative value of the various kinds of crops, should all be taken into the calculation of the farmer, in forming his plan of proceedings.—Chaptal's Agricultural Chemistry.

ARTIFICIAL PRODUCTION OF THE POTATO DISEASE.

PHILOSOPHICAL SOCIETY OF GLASGOW.

At the meeting of the Philosophical Society on Wednesday last, Mr. Walter Crum, referring to a letter addressed to him by Professor Liebig on the subject of the potato, in which the disease of that root is attributed to the putrefactive quality of the sap, stated, that in consequence of that letter he had been induced to make a few experiments, the results of which he proposed to lay before the meeting. On grating down (he said) a healthy potato, the surface of the pulp, or the part of it immediately in contact with the air, soon acquires a flesh-red colour, which goes on increasing in depth to a mahogany brown. In a few hours this is changed into a sooty black colour, such as I have observed in certain stages of the potato disease; and at last, after five or six days, we have again a brown colour, similar to what appears in that stage of the disease when the part has lost its firmness. This is a well-known process of putrefaction. It occurs in the apple, where a part that has been bruised very soon becomes brown. And the cause is also well understood to be the rupture of the vessels or bags in which, while the fruit remains entire, the saccharine matter is contained, and kept apart from the nitrogenous or fermenting principle. The grape also, in which the solution of sugar is contained in cells distinct from the gluten, may be preserved for a long time unchanged; but as soon as it is bruised, and the contents of the various cells are thereby allowed to mix together, the gluten, by attracting oxygen from the atmosphere, becomes converted into yeast, and fermentation goes on. By the continued exposure of such mixture to the air, putrefaction ensues, and the conditions are fulfilled for

the development of fungi. Such is the case when the potato is broken up and exposed. Its sap, which contains albumen (similar in composition and properties to the white of egg), and occasionally also casein, is thus brought in contact with the other ingredients of the root, and with the air. The consequence is a commencement of putrefaction, and the production of a disease to all appearance similar to that which has occurred in nature during the present year. Examination by the microscope confirms their identity. In two or three days a mouldiness appears upon the surface of the blackened pulp, consisting of fungi with long stalk, and globular heads, which emit when compressed a profusion of small round bodies, called sporules the seeds of new fungi. These seeds are in no danger of being confounded with the granules of starch, most of which, in comparison with them, are several hundred times as large. Sporules are said by the Irish Commissioners to exist in abundance in the diseased potato. If I have not been able to assure myself of having seen them there, at least of so definite a form as those from the new fungus, it is probably because I have not lately had an opportunity of examining the disease in its earlier stages. Lastly, after an exposure of eight days (and my observations extend over no longer time), when the pulp has in a great measure lost its blackness, and taken the (I believe more permanent) brown colour, small, extremely white and fine tufts appear on its surface, of a totally different variety of fungus, having apparently no head like the earlier crop, and consisting of long slender stems, which, when pressed down between pieces of glass,

appear lined on both sides with multitudes of very small sporules. This fungus corresponds with the tufts which grow on the outside of the diseased part of the potato. Their appearance is the same; but any specimens of the tuft from the diseased potato I have at present at command are much older than the crop of which I speak, and perhaps for that reason show fewer sporules. That a rupture of the cellular tissue of the diseased potato has actually taken place during the present year, has been already made known by Professor Kutzig, a German physiologist, who describes the so-called dry rot of former seasons as a disease in which the starch granules are so altered as to exhibit minute brown fungi, previous to the destruction of the cellular tissue; whereas at present the cells become destroyed, while the starch granules remain entire. On account of this peculiarity he has given to the existing disease the name of cell rot. In the short time during which I have been occupied with this subject, I have not been able to verify under the microscope these observations on the structure of the cellular tissue, from the difficulty of obtaining thin enough perfect sections of the substance. Professor Kutzig attributes the effects he describes to the weakness of the parts, occasioned by the too rapid growth of the tubers, and the absorption of too much water, which render the formation of a strong and durable cellular membrane impossible. But, on making the experiment, I have not been able to find that the quantity of water contained in a perfectly healthy potato is less than in one liable to the disease. I rasped down very fine white potatoes, from a moderate crop, grown on poor land with but little manure; and, having put a pound of the pulp into a bag, and squeezed it firmly with the hand, I obtained from it 59 per cent. of juice. A red potato from the same field, and equally unaffected with the disease, yielded 58 per cent. Another red potato, itself sound, but from a field which had been well manured, and which was much affected with the disease, gave 58½. In another experiment, where the juice was pressed out and the solid part dried, the fine white potato left 21.4 per cent. of solid matter, and a portion of a diseased potato left 20.79 per cent. There is therefore no difference in the quantity of water.

I shall not trouble the Society with any speculations of my own as to the manner in which this rupture of the potato may have been effected. The subject is surrounded with difficulties, and much close investigation is wanted to learn the circumstances which attend it. If the statements now made are correct, we shall find that fungi are not the cause, but a consequence of the disease in question, and our attention will be directed to prevent the formation of a soil in which the fungus always

fructifies, rather than to the parasite itself, of whose existence we should be ignorant without it.

Acids generally, and the acetic as well as the mineral acids, when added to the potato pulp, prevent or, in very small quantities, retard its putrefaction. Small doses of lime or of carbonate of soda, on the contrary, accelerate the blackening of the surface. Alum acts like an acid. Such neutral salts as the sulphates of soda, magnesia, or lime, nitrate of potash, sal ammoniac, and common salt produce little effect, and even the salts of copper and mercury, if added in quantities too small to precipitate the albumen, do not entirely prevent discolouration.

The quantity of albumen in the sap of the potato is much greater than is usually supposed. By boiling, it coagulates, of a light grey colour, and is easily collected on a cloth. On being dried at a steam heat it becomes quite black, breaks with a vitreous fracture, and has the smell of roasted meat. One pound of clear juice, representing a pound and a quarter of potatoes, yielded 112 grains; and nearly the same quantity was obtained from all the three specimens of sound potato already named. An ordinary sized egg contains 144 grains of the same substance in the white and yolk together. Two pounds, therefore, of potatoes contain as much nourishment, independently of the starch, as one egg. The manufacturers of potato starch would seem in this manner to throw away much valuable food which they might easily preserve.

PROPOSED ASYLUM FOR DECAYED FARMERS AND AGED AGRICULTURAL LABOURERS.—Under the above title some hints have been embodied and circulated in this neighbourhood in the form of a small pamphlet. We have been requested to draw attention to this scheme, and we readily comply with the request—premising, however, that we do so rather to invite discussion than to give any formal opinion ourselves, because there are several points on which much difference of judgment may very properly exist. Still in many respects it is deserving notice, and if we cannot agree with all the writer advances, yet every one will allow that to secure a comfortable retirement in old age for those who have toiled hard for many years is worthy a large amount of approval. It appears this asylum is proposed for the reception of such decayed farmers as are reduced to the necessity of requiring parish aid and whose characters are unexceptionable, and also for the poor agricultural labourers who have brought up their families without parish aid, and have also received rewards as able workmen and for long servitude, from agricultural societies. This proposed asylum is to be established so as to provide for its own support after the lapse of such time as will bring its resident members into active operation for its various wants. The proposer of the plan strongly urges the argument that the hard-working labourer, whose honesty and industry has been conspicuous, should have some more appropriate place than the workhouse, which, although good and sufficient in its way, treats all alike, and where those who have been diligent meet

only the same reward as those whose lives have been spent in idleness and dissipation. The small farmer, it is urged, has hitherto had no opportunity of making such provisions as are enjoyed by merchants and tradesmen. The annual income would be raised from many different sources, such as payments from societies, from various unions, subscriptions from the charitable and also voluntary subscriptions, profits from spade husbandry, as well as others, for which we must refer to the pamphlet itself. We observe that the projector of the plan is anxious to obtain the opinions of agriculturists and gentlemen interested in rural affairs, and all such communications can be

sent for him to Mr. J. Bowring, of the St. Thomas Union. For our own parts we feel that the only way in which anything like a competent opinion can be formed is by a careful consideration of the whole matter, and a perusal of the document itself will doubtless give rise to many valuable suggestions, and thus the result may at last be the practical formation of a plan embodying in a great measure the wishes of the projector. Indeed, if we cannot coincide with the author in all his opinions, we cordially welcome the philanthropic feeling which prompts him to benefit the honest and industrious when they arrive at "the vale of declining years."—Exeter Flying Post.

ON THE ST. JOHN'S-DAY RYE.

BY PH. PUSEY, M.P.

The late Lord Leicester advised that no farming experiment should be published until it had been successfully tried for three years. But though I have not grown the St. John's-day rye as yet even for two complete years, its promising appearance, and the approval of neighbouring farmers, encourage me to lay a short account of this plant before the Society. It was in 1842 that Mr. Taunton of Ashley, near Stockbridge, first made it known to me in the following terms:—

"In your digest of the progress of agricultural knowledge, you say, of early rye, that 'some farmers do not approve of it; for while young it gives but little food, and it shoots up rapidly to a harsh stalk, which stock do not relish.' But this reproach does not apply to the variety of rye which is the best worth cultivating, and, as I think, the only one worth cultivating to any extent for the purpose of green meat—namely, the St. John's-day rye (*seigle de St. Jean*). This plant, if sown in proper time, and on a suitable soil, presents itself to the scythe in a state palatable to horses for full three weeks, or more. I would sow not more than one-fourth of the ground with common rye by the side of it, for the common rye is a very few days earlier, and by the time when that becomes harsh and woody the St. John's-day rye has attained its perfection. Of this latter I have had, on a suitable soil, to the extent of 11 London loads of straw per acre when left for seed; for it will grow from 6 to 7 feet high. The time to sow it is the 24th of June; at all events, get it in before July. The soil for rye ought to be a siliceous soil; it does not reject a considerable admixture of clay, but it ought to come under the description of a sandy loam. If you want such a burthen as I have described, of course the condition of the soil must not be poor, and such produce will pay for good land.

The soil, too, needs to be compressed after sowing, if the land be at all light, by rolling or sheep-treading; otherwise the rye-plant is peculiarly obnoxious to the wire-worm. The mass of foliage in October would induce you to feed it then; but I would recommend you to abstain: the leaf (unlike winter barley) is very little changed by the winter, and it so cherishes the young foliage, which shoots up in spring covered with this dense mantle, that it will repay your forbearance with ample interest. I have seen it in the end of February, or beginning of March, equal, if not superior, to the best water-meadow for ewes and lambs: for soiling in stable, the horses will eat it when the ear is fairly developed, and it may perhaps be 5 feet high (according to the soil); it will have tillered so much that the produce will be a very heavy one."

In June of the following year (1843) Mr. Taunton sent me another account of his further success in the growth of the St. John's-day rye:—

"I inclose to you a stalk of my St. John's-day rye, length 6 feet: it has not yet flowered. I began to soil eight cart-horses with it on the 13th of May, then 3 feet high, and four cows a week later. Both these kinds of stock still eat nearly the whole of it, with scarce any waste, so that it has now been twenty-two days in use, and I expect that they will eat it freely some days longer: thus, you see, extending its eatable state nearly to a month. If I had possessed a greater breadth of this crop in the present season, I should have begun a week earlier, not waiting till it had attained the height of 3 feet.

"The ground which bore this had a dressing of dung just before sowing. It succeeded wheat, cut green into stable; but your calcareous grit detritus is a far more favourable soil for rye than our chalk.

"This plant, and, I believe, this variety, proved fatal to hundreds of our brave men on the sandy plains of Belgium, two days before the battle of Waterloo. They marched through fields of it higher than their heads. The glittering points of their bayonets marked the track of their march to the enemy's artillery, which was on an eminence; while the rye being higher than their heads, they could see no enemy, and knew not whither to direct their fire."

Mr. Taunton having presented me with some seed of this rye, it was sown in the course of July, 1843, on some poor moory soil without manure, was fed off in the autumn, and again in the spring, yet produced on little more than a quarter of an acre, 13 bushels of seed. That seed was sown again last year in August as soon as harvested: it produced on a sandy loam very good feed in the autumn, and in this backward spring it realized Mr. Taunton's description, and established its character here by covering 4 or 5 acres with a thick coat of herbage, in which the lambs were browsing breast high, while there was little or no other feed in the neighbourhood. I find, too, in the late Mr. Rham's "Dictionary of the Farm," a yet more favourable account of it. Under the article Rye in that convenient little book, our lamented colleague observes: "There is a variety of rye mentioned by continental authors by the name of St. John's-day rye, because it grows so rapidly that if sown about St. John's day it will be fit to mow green by the middle of September; and in favourable seasons may be fed off again in November without preventing its giving ample feed in spring, and a good crop of grain at the next harvest. It might be advantageous to introduce this variety into England, if it be not already known." On the other hand, it is right to state that, when our seedsman, Mr. Gibbs, inquired respecting it in its native country, he was informed that its cultivation was not spreading in Belgium. But the reason assigned was its inferiority to the common rye in yield of seed; and this objection, though valid in countries where rye-bread is eaten, will not apply where, as in England, rye is intended principally for green fodder. Although then, as I said, my trial of the St. John's-day rye is incomplete, and though it has not been sown here as yet on its peculiar day, it has evidently two advantages over the common rye. It tillers so much as to produce double the quantity of herbage on the same space of ground. Indeed in one field where the two varieties were growing together, the common rye, after twice feeding off, became so thin that I ploughed it up; while this new rye covers the ground with its third crop as with its first. Besides tillering more, it is also sweeter than the

common rye when young. Where they grow together, the hares and rabbits, while we had any, ate it before the other. Its principal merit, however, is its superior sweetness in advanced growth, and the consequently longer time during which it remains fit for use as spring feed. Good farmers who have seen it agree with me, that this new rye should be tried upon such light hollow soils as we sometimes find on our southern chalk-hills. On such land, in dry seasons, farmers often lose their turnip crop after it is singled out; but rye is known to bear well such looseness of soil. If it were sown instead of turnips, or where the turnips had missed, on a part of the turnip-land, even one green crop in the autumn, to say nothing of two, and another in spring, might compensate for such a crop of roots as this land generally yields. If it stood for seed afterwards, it would then also take the place of the barley crop, the turnip's natural successor; and the rotation would remain undisturbed. I will only add one suggestion, or rather call attention to a statement of Mr. Taunton's—that if the St. John's-day rye be left uneaten in the autumn, it will afford feed for ewes and lambs equal to the best water-meadow, as early as the beginning of March or the end of February—an invaluable time for such feed. All that is hoped of a new plant is seldom realized in practice; but what I have myself seen of the St. John's-day rye, and the opinions of farmers who have also watched it make me sure that I should not be rash in advising occupiers of light lands to give it a trial, but that unfortunately, as I am informed, no seed is now to be procured abroad with a certainty of its genuine ness.—*Pusey, May 12, 1845.*—Journal of the Royal Agricultural Society.

ON A VARIETY OF RYE AS GREEN FODDER.

BY ROBERT BAKER.

TO PH. PUSEY, Esq., M.P.

SIR,—I read with much attention the communication made by you to the Committee of the Royal Agricultural Society "upon the growth of St. John's-day rye," and as I have cultivated rye for feeding purposes for several years with great advantage, I have much pleasure in communicating the results.

The difference in the varieties of rye I discovered accidentally some years since. Having obtained seed from two different seedsman, I found in the following spring that for the purposes of early feed

the produce from the one was a *fortnight earlier*, and *twice* as much in produce superior to the other. Since that time I have invariably grown my own seed, and rarely fail in obtaining a plant, whereas previously I hardly ever obtained one, from the circumstance of old rye being mixed with new by persons interested; and the *old* very rarely vegetating, my plants were thin, or failed altogether.

I have, from long experience and observation, brought my system of cultivation to such a degree of perfection, that I never fail succeeding in obtaining a plant; and by the application of the produce I am enabled to support all my horses and neat stock for two or three weeks before my neighbours commence. From the middle of April last I have thus been enabled to maintain upwards of forty horses and colts, and fifty head of neat stock: the former up to the present time, and the latter until the 14th of this month, almost without the assistance of hay. The chief difficulty I had to contend with was to remedy the great waste occasioned by the horses and stock in foddering; for as the rye advanced in stem, the stock would eat only the most tender portion, and if tares were sown in conjunction, would waste the greater part of the rye in the endeavour to extract them whilst feeding. To remedy this, I now cut the whole into chaff; and by the addition of a small quantity of hay, and about one-half sweet wheat or oat-straw (which I gradually diminish as the season advances) I succeed in obtaining a description of food of which, for early use, I know of nothing as an equivalent, whether in point of cheapness or utility, besides the advantage of gradually adopting the change from the dry to green food without risk or inconvenience to the animal. The number of acres consumed to the present time, of rye alone, and in conjunction with tares, does not exceed nine acres, and the land upon which it is grown is already in a forward state for turnips. I will now give a condensed statement of the process, and advert to those points necessary to be attended to in the cultivation as I proceed.

To succeed to perfection, a fine tilth must be obtained, and the land should be of a sandy or gravelly quality. The rye should be sown when the weather is *perfectly dry*, and the land harrowed previously, so that it may be covered as lightly as possible. If sown upon a whole furrow, or during wet weather, or if put in deep, it rarely succeeds. These are the three points that require particular attention in its cultivation. My plan is to plough a clean wheat eddish immediately after the wheat-crop is removed; and with two or three scarifyings or additional ploughings, reduce the soil to the finest possible degree of pulverization. After the last ploughing I harrow the land before depositing

the seed; and about the middle of September or early in October I sow three bushels of seed per acre, which is harrowed in lightly, and the land left without rolling, unless with a very light roller between the harrowings. If the rye is very forward (which, from having a mild autumn, is sometimes the case), it will, in the event of a heavy fall of snow succeeding, be sometimes greatly injured for spring use; but it must on no account be fed off with sheep, as it never comes well to the scythe afterwards. A portion should be manured for the first cutting, to enable its being used a week or ten days earlier. When ready for use, which in ordinary seasons takes place at the commencement of the month of April, it is carefully mown, and cut by a chaff-cutting machine, with the addition of a moiety of straw and hay, the proportion of the former being as four to one of the latter; and the cutting should so proceed that it may be adapted to the consumption of each day, using it as soon after being cut as possible. The chaff-boxes used by me are of the common sort, having an adjustment, invented by Dyball of North Walsham, for feeding without assistance of the person using them. The cost of cutting is from 14d. to 15d. per 60 bushels, and a man cuts from 100 to 120 bushels per diem. The horses are fed in the stable with oats in addition, and in the yards at night with cut chaff only. The cows and neat stock are fed with the addition of oilcake, broken fine or not, as may be requisite, and no portion whatever is allowed to be wasted; for by supplying it from time to time as required, every particle will be eaten. As the rye advances into ear, less straw and hay are then used; and of every 100 bushels added at the present time, 56lbs. of hay and 72lbs. of wheat-straw are the proportion, some tares being grown in conjunction with the rye.

I know of no other food for *early spring use*, as a substitute for hay, equal to this, nor of any other system whereby so large an amount of excellent food can be procured from a small quantity of land; and, in point of economy, those who have not adopted the system have not the slightest conception. During this spring in particular I have found it of most decided advantage; and at the high price of hay at the present moment I estimate that every acre of rye, thus produced, has been worth at least *8l.*; and when it is considered that it is obtained with scarcely any injury to the land whatever (turnips succeeding as well after it as it can be desired), I am induced to make this communication in the hope that, through your endeavours to promote the interests of the British agriculturist, it may become known and more generally adopted in other districts.

I shall be very glad to forward you a small quan-

tity of my seed when ripe, that you may be able to compare it with the St. John's-day rye you have referred to.

I have the honour to remain, sir,
Your obedient servant,
ROBERT BAKER.

Writtle, Essex, May 24, 1845.

P.S.—I have since weighed a square perch, and find the weight to be twelve stones, or 168lbs.; and on parts of the field it would have weighed at least 200lbs. Upon an experiment made, we found the

horses refused altogether to eat it if uncut; and I am so convinced of the economy of this mode of feeding, that I am still cutting that of which the larger portion is tares, and shall continue to do so until midsummer.

Note.—It appears to me that Mr. Baker's variety of rye, though equally or even more valuable, cannot be the same with the St. John's-day rye, because it is earlier than the common rye; whereas Mr. Taunton states that the St. John's-day rye, so far from being earlier, is a few days later.—*PH. PUSEY.*—Journal of the Royal Agri. Soc.

PROTECTION TO AGRICULTURE.

ANNUAL MEETING OF THE CENTRAL AGRICULTURAL PROTECTION SOCIETY.

The annual meeting of this national society took place on Tuesday, Dec. 9, in the rooms of the society in Old Bond-street. The position which the great question of the corn laws at present occupies, and the statements recently put forward with regard to it, had attracted more than an ordinary share of public attention to this society, and to the steps which, at the present emergency, it would take. The agricultural interest throughout the land was anxious to hear authoritatively from the leaders of the protection party whether they were willing to adopt the advice which weak men or interested writers had given to them, and to follow the example set by some pretended friends of the farmer, in recommending a compromise of this grave and all-important matter. The eyes, therefore, of all the farmers and landowners of England were turned towards this society, which was established for the very purpose of maintaining and upholding a fair and legitimate protection to the industry of the country; and it was anticipated—and, we are glad to say, not in vain anticipated—that the president or committee of the society would be prepared to recommend the adoption of more active and energetic measures at the present crisis. The meeting of members was announced to take place at two o'clock; and before that hour had arrived, fifty or sixty of the most influential landowners and tenant-farmers, from all parts of England, were assembled. It must not, however, be supposed that the number of those actually present affords anything like a fair criterion of the power and influence of the Protection Society. Unlike their vulgar and noisy competitors of the *League*, this society is not desirous of influencing popular opinion by the muster of its forces, or by the clamour of its speakers. Hitherto, perhaps, foolishly disregarding of the ordinary and more familiar means of moving and exciting public sentiment, they have contented themselves with a quiet, silent, and unambitious support of the principles they profess; and the fifty or sixty gentlemen present on Tuesday afternoon—of great personal weight and individual influence, no doubt—yet derive

their main and especial authority from the fact that each of them, singly, represented a considerable district of the country, and that they all stood there as the representatives of the views, the principles, and the resolute determination of absent hundreds scarcely less powerful or influential than themselves. In addition to this considerable and most respectable body of gentlemen who formed the great bulk of yesterday's meeting, we were glad to see, as must indeed every friend of British agriculture be glad to hear, that members of the Legislature, upon whom must rest the leadership and management of the question in the field where its issue will be decided, were not wanting. His Grace the Duke of Richmond was in the chair—a man, than whom this country has none more able, more honest, or more resolute to help her when her hour of trial shall arrive. The president was surrounded by several of the best, the truest, and most determined friends of agricultural protection. We more particularly observed the Marquis of Salisbury, G. J. Heathcote, Esq., M.P., A. S. O'Brien, Esq., M.P., C. N. Newdegate, Esq., M.P., W. Miles, Esq., M.P.; Revs. J. Cox and — Gwilt; Messrs. Sutherland, Fisher Hobbs, Healy, Shackel, G. Brown, Pickin, Bennett, Jonas, Turner, Lewis, Hudson, Weall, Allnatt, Rodwell, and W. R. Browne, as well as several gentlemen representing county protection associations. Communications were also received from his Grace the Duke of Buckingham, Lord Ingestre, and Mr. R. Baker, who had been desirous of being present, but were prevented from attending by unavoidable causes.

His Grace the Duke of Richmond, having taken the chair, immediately rose and spoke as follows:—Gentlemen,—I am anxious, before I propose the first motion which I shall make to you—viz., that the report of the committee be read—to call the attention of the society to the situation which at the present moment we are in (*loud cheers*). You, gentlemen, are aware that, since our last annual meeting, a certain number of individuals who formerly called themselves "friends of the farmer," who stated boldly on the hustings their adherence to our

opinions, and who said that they were willing to give protection to agriculture, have since changed their opinion (*cheers*), and that now they are found to be the bitterest opponents to protection of British industry (*loud cheers*). It is not for me to impute motives to such persons. I will not impute to them motives other than those from which I myself would act (*hear, hear*). They are not here to defend themselves, and I am too much of an Englishman to attack any persons behind their backs. But I will say, that it is most unfortunate that they ever joined the cause of protection, that they ever stated on the hustings their willingness and determination to support that cause, and that they succeeded solely because they so stated (*loud cheers*). For my own part, I am not surprised at Lord John Russell's letter (*hear, hear, hear*) to his constituents of London; for after I had heard him say, in the House of Commons, that "Protection was the bane of British agriculture," I expected nothing whatever—at least, nothing better—at his hands. And I confess that I am glad that he has spoken out (*cheers*). I always regarded his proposal of a fixed duty as nothing but a declaration of an anti-protection principle; and I thought then, and still believe now, that if that proposal had reached a third reading, absolute free trade would have been established (*hear, hear*). There is another lord—I mean Lord Morpeth—of whom I must also say a word. That noble lord is everything one could wish in private life—honest, upright, straightforward, and most amiable; and I confess that I am surprised that Lord Morpeth should have sent £5 to the League. A man of such high honour and noble principles—would he create fictitious votes in every county of England? (*hear, hear.*) Would he, personally and individually, give £5 to a newspaper for promoting and publishing libels against the character of those with whom in politics he disagreed? (*hear, hear.*) He, gentlemen, would do neither in his own person; but he sends £5, that others may do for him the dirty work he is too honourable to do himself. So, I say, I am surprised that that noble lord has thought himself justified in joining the League; but I ask you, the landowners and tenant-farmers of England, are two or three noble lords or half-a-dozen members of Parliament to frighten the yeomanry of this country? (*loud and general cheering.*) Is their condition, and is your condition, so low that you dare not venture to maintain and uphold your own honest opinion in favour of yourselves and of the labourers you employ; and you dare not so do, because a few inconsistent men have deserted you? (*loud cheers.*) There is one thing I particularly wish to mention. I will tell you at once, plainly, that I believe the alarm so industriously spread about, as to famine, to be a gross delusion (*hear, hear*). From what you have been already able to hear up to the present moment, and from the returns which will be presently read to you, you will see that the cry which has been raised is a delusion, which no men of respectability would have put forth if they had been acquainted with the facts as we are (*hear*). At the last general meeting of the society, I said that I did not think it desirable that we should agitate the country in favour of protection. I felt that

it was not our business as farmers. I knew that it would be against the wishes and inclinations and habits of us all to excite a general agitation in this momentous question, to set man against man, to beget those evils which, in my opinion, agitation must always produce (*hear, hear*). But (*cheers*)—but in the present posture of affairs I say that it is our bounden duty to speak out (*loud cheering*). I say that it is the bounden duty of every farmer to proclaim his opinion and his determination. I say it is our bounden duty to appeal to the yeomanry of our country, and to ask them if they have changed those views with which they triumphed four years ago (*continued cheering*). For my own part, I still believe that protection is necessary for all the interests of this great country. No one would be less disposed to support it, if I did not think it of vital importance to the welfare, the happiness, and the independence of the nation (*cheers*). But in advocating protection, let it not be supposed that I do so for the benefit exclusively of one class of society. I advocate it for the combined benefit of all. Why, it is said that we landowners support agricultural protection for our own interests, and for the maintenance of our own rents; but I am sure I never heard any free-trade landowner go so far as I would on that point. The free-traders say that their scheme will not hurt the landed interest. Then, if this be so, how can they say that the landed interest, from selfish motives, opposes a measure which is not to hurt them? How can they take credit to themselves for supporting a measure by which, according to their own showing, they will lose nothing? (*hear, hear.*) This very statement, which they are so fond of making, cuts from under their feet the ground of their accusations against us (*hear, hear*). But, I ask, if free trade is carried, are they willing to destroy the existing leases? (*loud cheers*). I should be willing to get rid of every lease; but what is the farmer to do with his stock? What is he to turn his hand to? Oh no! the matter does not admit of argument—it is ruin to the country from beginning to end. Lord John Russell may tell me that protection is the bane of agriculture, but I know what really is the bane of agriculture. It is the spirit of party (*loud cheers*), those party politics which induce men to stick to their party leaders when they know that those leaders are wrong. Yes, these party politics are the real bane of agriculture—the great and grievous cause of evil to the country at large—party politics, which induce the men in opposition to bid higher than the Minister for power which, if the Minister bids 2s. 6d., induce them to bid 5s. This it is that has been, and still is, the bane of agriculture. But now, Gentlemen, in your hands, and, with the Protection Society, rests the weal and welfare of this country (*loud cheering*). I have not come to this conclusion without much reflection. I beg of you not to be weak enough to be deluded into any compromise. Your real enemies, who falsely profess to be your friends, will say to you, "Do it now, now consent to a compromise; later you cannot; after this it will not be offered to you." But, Gentlemen, remember this is a question of principle. Once consent to any compromise, and we shall not have a leg to stand on (*cheers*). So, I say to you, act according to the consti-

tution of the country; for I will not recommend to others what I could not and am not ready to do myself; and come what may, I, for one, must stand by the constitution (*cheers*). But the constitution gives you power, and power enough, to accomplish our purpose. The Protection Societies throughout the country must be up and doing. By all fair and legitimate means you must show your determination to the Minister and to the Leader of the Opposition. I say nothing of the League—for the League would be nothing were it not led and supported by such men as Sir Robert Peel and Lord John Russell. I hope and trust that the recent report of an intention on the part of the Government to move the repeal of the Corn Laws on the first or second day of the session is not correct. I, for my own part, do not believe it. I cannot believe, upon such authority at least, that such perfidy would or could enter into the mind of man. If, however, such should turn out to be the case, all I can say is, that I most sincerely hope that the House of Commons—that the representatives of the agricultural constituencies returned for the express purpose of defending agricultural interests—will turn it out in the Lower House (*loud cheers*). But if they do not, I look to the hereditary peerage of England (*loud cheering*). I have thought it my duty to say thus much, and in saying what I have said, I have spoken my own individual opinions. No one else is compromised or committed by anything which has fallen from me as an independent member of the Protection Society; but what I have said here I am willing to repeat in the House of Lords, or anywhere else; for upon my conscience I believe every word I have uttered to be strictly true. I will now say no more, than to request my friend, Mr. Stafford O'Brien, to read the report of your committee. Then, gentlemen, it will be for you to express your opinion as to that report, and to state what you recommend for the purpose of preventing protection from being taken away from us either as a whole or in part. His grace resumed his seat amidst loud and general cheering.

A. S. O'BRIEN, Esq., M.P., then read the following report:—

"In presenting their second report, the committee need not remind the society that as the demand for tracts, whether in favour of the principle of protection, or of free importation, has very considerably diminished, if not wholly ceased, the exertions of the committee during the last year have not been needed, either to issue reprints, or to increase the stock of publications, whose list is on the table before you. The mode of agitation adopted by our adversaries has been partially changed: they have not so much attempted to influence public opinion through the press, except by means of their own periodicals, neither have they been so energetic in the employment of itinerant lecturers as before: their labour, since they find they cannot influence constituencies, has been directed chiefly to create them, and this is a mode of warfare which the fourth rule of your society forbids us to engage in. We have no means of knowing how far their proceedings have been attended with success, as we believe the country societies have laid down for their own guidance the same rule which you laid down for the guidance of this central one. The last session of Parliament was not much occupied with questions affecting the agricultural interest, but the results of the divisions taken against Ministers, in reference to

the principle of protection to British industry, were hardly such as would have been anticipated by the constituencies of 1841; and when our friends see that such diversity of opinion exists amongst those who represent them in Parliament, they can hardly expect that any central society, however constituted, should realize the expectations formed at its commencement. The question of agricultural statistics was again brought under the consideration of the House of Commons this year, and Government gave it to be understood that the difficulties in the way of obtaining them were insuperable. Your committee have, however, forwarded to every protection society in the country printed circulars, requesting returns of the quantity and quality of the crops. These returns are not yet entirely completed, some of them only arrived yesterday, and some few societies have written to state that they cannot prepare them for a few days. The general conclusion, however, to be drawn from them is, that although the potato crop, in parts of England and Ireland is deficient to a greater or less degree, yet the supply of food in this country is such as to set at rest all fears of scarcity; and, considering the unfavourable seasons of the past year, and the scarcity either at present existing, or to be reasonably anticipated, in many of the neighbouring countries, your committee cannot but feel that the plenty in our own land may be a source of honest pride to the English agriculturist, and of sincere thankfulness to divine Providence. Your committee cannot but feel that if the people of this country had unfortunately consented to render themselves habitually dependent upon foreign nations for a much larger supply of corn than they at present derive from them, the circumstances of the foreign corn trade, and the conduct of some foreign Governments afford, this year a striking proof how serious might be our disappointment, and how great our national distress, upon the occurrence of a partial failure in the domestic supply. The possibility of devising a plan whereby, without serious injury to the revenue, the use of malt would be permitted duty free for the feeding of the cattle, has engaged the attention of your committee. Notwithstanding the failure of all chemical experiments on this subject, a bill was introduced, whereby it was hoped this end might be attained. The Government opposed this bill by raising technical objections, and the opponents of protection by demanding the introduction of Indian corn or Egyptian beans, forgetting, or not choosing to remember, the abolition of all protective duties would leave the question of the desirableness of malt for cattle precisely where it was before. The number of country societies in connexion with us is larger than at any time since our formation, and we receive from all of them the cheering intelligence of constant employment and good wages being given to the agricultural labourer. But we have still to regret the existence in several counties of societies so small as to require consolidation among themselves, whereby great unity of action could be obtained and greater strength exhibited. While your committee adhere to the present protection by law established, they must strenuously urge upon landlords to encourage their tenants by every means in their power, and the tenants to respond to such efforts on the part of their landlords, in order that these combined efforts may keep a domestic supply of provisions commensurate with the rapid increase of our population. Your committee have read, without astonishment, the recent declaration on the part of Lord John Russell, of his having abandoned, irrespectively of any temporary cause, all his former opinions in favour of a fixed duty, which declaration, however, on his part is a conclusive proof of the little reliance to be placed in those who would propose further concessions. An assertion been made in the *Times* newspaper that it is the intention of Government to repeal the Corn Laws next session. Your committee cannot believe this, considering the magnitude of the

interests involved, and the principles professed by those who framed this very Corn Law; but they trust that Ministers will see in the general panic diffused by this unauthorised statement an unfortunate result of their conduct during the last four years. While your committee have to congratulate the society on the result of all the recent elections, as proving that noise and clamour have not changed the public opinion, and while your committee well know that political agitation is as distasteful to the habits as it is prejudicial to the business of the agriculturist, they must remind the society that the declaration of Lord John Russell, and the renewed efforts of the League, have rendered necessary every watchful exertion on the part of the friends of protection. We, therefore, feel justified in calling on all country societies to use all the means they may, in their several localities, judge best suited to the enunciation and maintenance of the common principle which binds us together. Our strenuous co-operation shall not be wanting, well convinced, as we are, that there never was a time since our formation when so much depended on united exertions for the support of the most valued institutions of our great and free country."

Mr. WEALL moved that the report be approved of, which was seconded by Mr. FISHER HOBBS, and unanimously agreed to.

Mr. H. BYRON, the secretary of the society, then, at the request of the chairman, read an analysis of reports which had been sent up to the society from local societies in almost every part of England, respecting the result of this year's crop; the result of which was that in every district from which returns had been received there was stated to be a full average of wheat and other crops, in many of them considerably above an average; and that though in almost every district the potato crop was more or less diseased, still that disease had been in almost every instance greatly exaggerated, and that in the words of the noble chairman, the labourers throughout the whole of the agricultural districts had full work, and at good wages.

Mr. HARRIOTT said there was one view of the potato disease which he was anxious to impress upon the meeting; that as they could be used in fattening hogs, and as the yield of turnips was greater than in any former year, it was probable a greater quantity of hogs and sheep would be brought to market than before; so that the potatoes, though they could not be used for human food in the first instance, would go to increase the supply in the shape of butcher's meat. This was a view of the case which he thought was calculated to diminish the alarm that now prevailed (*hear, hear*).

Mr. THOMAS, a tenant-farmer in Bedfordshire, rose to move the next resolution—"That the Agricultural Protection Society of England, having made inquiries in every county of England, into the probable yield of grain for the subsistence of man, have the most unbounded satisfaction in stating that an average crop of corn has been secured for the maintenance of the people of the nation." He was very sensible of his incapacity to do justice to this resolution; for the quiet habits and the secluded position of an agriculturist unfitted him from expressing himself with ease or clearness in public. But there were times, when it was necessary to get over these difficulties, in order, if possible, to stem the torrent of a great mistake, or to correct reports which might possibly have a mischievous effect on the country. There

were times when private feeling must yield to public duty; and there never was a time calling for such exertions as the present (*Applause*). He would be the last man to come forward and move such a resolution as that he had read, were he not convinced in his conscience that it was the fact. He was himself extensively connected with agriculture, and he was acquainted with farmers in almost every county in England, so that he could honestly bear testimony to the truth of the resolution, that, taking the whole of the country, there was above an average supply of food for the use of man (*Applause*). With regard to the potato crop, some extraordinary statements had appeared in the newspapers, and great fears were entertained lest the supply should fail in Ireland. Now it must be admitted on all hands that the potatoes in many parts of the country were more or less diseased; but, then it must be remarked, that if they had not been diseased there would have been a larger crop of potatoes this year than had ever before been known in this country; and if the per centage of the diseased potatoes were taken away, there would remain nearly the same available amount of potatoes as in ordinary years. Besides, every man who knew anything of agriculture knew that a considerable quantity of potatoes were used for the food of cattle. Now, in years of scarcity, the potatoes, of course, would not be so used, and, therefore, they might calculate that the potatoes which in ordinary years went to feed cattle, would this year be available for the support of man. Taking these things together, he was sure the meeting would agree with him that among those really acquainted with agriculture, there was no fear, no likelihood of fear, of any starvation in the country. It was only on coming to the metropolis, and mixing with men who knew nothing of agriculture—men who were afraid to leave their desks—it was only on coming among them that he heard the apprehensions of scarcity. This feeling had been very considerably added to by the statement which lately appeared in the "Times," and which was calculated to create a general panic, to the effect that the ministry were now about to propose the abolition of a law which they themselves had proposed and carried in the present House of Commons. He, like his Grace the Chairman, did not believe that statement; he did not, and could not believe, that all honour, and good faith, and integrity, were banished from the land (*Loud applause*). He could not suppose that parties in their station in life, and in the power to which they had attained, could be so forgetful of their promises, so faithless to their pledges—could be so forgetful of their words, so deceitful to their supporters (*Great applause*). He did not say there might not be times when parties might be honestly convinced that the opinions they formerly held were erroneous. It was possible that some of the present ministers might take a different view of the measure now to what they formerly did; but then he did not think that they ought to be the parties to propose a change, but, as honest men and as gentlemen, they ought to allow others to propose such a measure, and thus let the "engineer hoist with his own petard." But if they did so, he must regard them with a feeling of disgust, as well as of scorn, and the same remarks would apply to those who raised the cry of farmers' friends in 1841, and who,

forgetful of all their pledges on the hustings, now joined the ministry in attacking the very principle which they were sent to Parliament to defend (*Hear, hear*). A considerable per centage of protection had already been removed by the ministry, and now they wanted clearly to know from their representatives where they meant to stop, or whether they were prepared to go as far as Lord John Russell, who had now declared for the Leaguers. He did not conceive that such would be the case; but certainly the recent conduct of a few members of Parliament was calculated in a great degree to shake their confidence in public men. Another election was, perhaps, near at hand—in the course of events it could not be far off—and then he hoped there would be no mistake as to the character of the candidates (*Loud cheering*). He, for one, would never consent to vote for any man who would merely give in his adhesion to the ministry; who would vote that black was white one day, or that white was black the next, merely to please them—to such a man he would never adhere, much less vote for him. He concluded by moving the resolution, which he honestly believed to be perfectly true, or he should have been the last man to move it (*Great applause*).

Mr. W. BENNETT, a tenant of his Grace the Duke of Bedford, said he had been called upon to second this resolution, and in doing so he trusted his Grace would pardon him for making a few observations on the present circumstances in which they appeared to be placed. He wished it distinctly to be understood that as for many years he had been a decided and conscientious supporter of protection to British agriculture, he remained now precisely of the same opinion as in years gone by; and he would say, at the same time, that if he thought that, by advocating protection to British agriculture, he was advocating a cause that was mischievous to the rest of the community, he hoped he would be the last to proceed in the course he had taken on this great principle, which was, that not only was protection to the agriculture of the country really necessary to secure the good cultivation of the land, but that it was necessary also for all the best interests of the country. It was to him a matter of regret as well as to the last speaker, that they were placed in the position in which they were with regard to public men. His Grace had observed in his opening speech that he never would sanction any but constitutional measures; but he must say, after witnessing so many derelictions of principle on the part of public men of late years, that it was no wonder if the agriculturists in some instances had fallen into extravagance, for they had often been deceived, and almost goaded into madness. He knew at the same time that the agriculturists had many sincere friends who advocated their interests in part, and in many instances at great personal sacrifice. It was with deep regret that he saw the farmers placed in their present position, especially as it unsettled every thing connected with agriculture. That was the greatest bane they could have. A noble lord had lately stated that protection was the bane of agriculture. His (Mr. Bennett's) decided conviction was that the everlasting meddling with agriculture was its great bane. There was no security whatever. When they sowed they did not know but some new-fangled notion would be promulgated,

and perhaps adopted, before their crop was secured. This awful insecurity of everything relating to the soil was calculated to drive a wise man mad. He confessed, if it were to come to that, he knew that it would cause the greatest possible mischief in the country; but, if it were to come to total repeal, he said the sooner the better. He was persuaded that every kind of agitation was mischievous in the highest degree, and their only security was to look out for honest men who would support their cause, without regard to party, as the noble duke had justly observed, that the greatest bane to the country was the party feeling in the land. Unless they endeavoured to secure men of honesty and integrity, without regard to party, there would be no security for anything connected with the country. He was forced to make these observations; but facts showed that the agriculturists had been exceedingly ill-used; and that it was necessary they should now look round and take that course which would be likely to place them in a more beneficial position than that they now occupied. Much had been said about a scarcity in the country. He had never been so staggered in his life as when that cry was first raised. It was very palpable that that cry had been raised by certain parties with the view of breaking faith with the agriculturists—that it had been raised in order to justify the admission of corn from every part of the world. But what was the fact—a fact which must stagger every right-minded person who had become alarmed at the idea of scarcity—why, in the first six weeks after harvest, more corn had been sold in market than at any corresponding period for the last seven years—that more corn had been brought into the markets of England, by some thousands of quarters, than in any previous year for a number of years back. How, then, in the name of common sense, could such a state of things be considered as a proof of scarcity? Then a commission had been sent over to Ireland to show that Ireland was in a desperate condition of famine. But let them look at the quantity of Irish produce which was every year brought into England, and they would find that every week it was increasing, and that the quantity sent this year was enormous. If the poor wretches were really starving, they ought to keep these good things at home; and this state of things showed, at least, that they were very fond of the English market for the sale of their goods. He made these remarks because he conscientiously believed that these statements of famine and scarcity had been got up for an illegitimate and dishonest purpose (*Applause*). He believed he was surrounded by agriculturists from the county from which he came, and he was sure they would bear him out in saying, that he never before saw the stack-yards so full, that there never were such crops of turnips and of other food for cattle; that barley was above an average; and that though the wheat crop was not equal to that of last year, yet, that over the whole country they had a full average crop (*Several gentlemen*—"More.") He wished to speak within bounds; if he were to speak his private opinion he should say, more than an average—(*hear, hear*)—but, speaking moderately, he should say that the crop was fully an average one. Then, though there were diseased potatoes in the country, yet it must

be remembered that it was a large potato-growing country, there being many market-gardeners in it, and it was known that more potatoes had been raised this year than ever before, so that he believed there was a fair average crop of potatoes fit for the consumption of human beings. It therefore appeared to him that this marvellous statement had been got up to damage their cause and to aid the League. If he thought that the means of the League tended to benefit the general interests of the country, he would be the last man to oppose them; but it was to be remembered, that with the reasonable protection which the last corn bill afforded them, all classes were flourishing. There was another fact, which could not be denied, and which certainly placed the League statements in a singular point of view. It had been stated by them repeatedly, that the interests of the country never could rally under the sliding-scale, while it was the fact that at the present moment, and under the existing law, the manufacturers were in a better state than they had enjoyed for many years. In every large town the people were well employed, and all this took place under the operation of the much abused sliding-scale. How this came about he wanted to know. Now, if protection was the bane both of agriculture and manufactures, how were the manufacturers so well off? His decided conviction was, that there was not a word of truth in their statements—that the country was in a flourishing state—that the agriculturists were in a condition to supply food at a reasonable rate to the people—and that the country was in much better circumstances than it would be if, our home agriculture being discouraged, we were to depend upon foreign produce. If that state of things were to take place, the country would be in a much worse position than at present; and he would call to their mind an observation made by Mr. Grant, in committee, relative to the duty of foreign Governments and the exportation of food in a time of scarcity. He thought that ought to convince every man that he could not be in better hands than in those of the British farmer. The fact was, that at the present time the French Government had laid a duty equal to 10s. per quarter on the present market price of exported corn. This was a striking proof of what they might expect if they depended upon foreigners, and allowed the poor lands of this country to go out of cultivation, which they knew grew a great deal of wheat. If he was not mistaken some of the German states had prohibited the exportation of wheat altogether (*hear, hear*). With these observations he would very cordially second the resolution which had just been proposed, as he had no reason to apprehend any scarcity in the country at all. He would only further remark that, since he came to town, he had had an opportunity of comparing Lord John Russell's letter to the farmers of Huntingdon with his recent letter to the citizens of London, and that he infinitely preferred the first to the last (*laughter and applause*.)

Mr. J. J. ALLNATT, of Berkshire, said he was anxious to state his opinions upon this important national question, the probability of a scarcity of food. He lived in a part of Berkshire which was of a highly cultivated character, and he was extensively connected with the tenant-farmers, and he could attest that, far from there being a scarcity

of food, in his neighbourhood there had not been a more abundant crop for many years past. Instead, therefore, of indulging in repining and gloomy forebodings, it behoved them, not only as members of this society, and as connected with agriculture, but as members of the community and as Christian men, to return their hearty thanks to divine Providence, because of the highly favourable position of this country at the present moment over the other corn-growing countries of continental Europe. If the present state of the crop was to be urged as a reason for abandoning protective duties, he thought it right to say that under this system they had been enabled at the present time, when scarcity had visited the continental states, to supply the people of the land with corn at the present emergency. They should also recollect that the crop of last year was an abundant one, and that the supply of old corn was not yet exhausted; so that there could be no doubt, with the blessing of Providence, the people of this country, in spite of the outcry which had been made, would have enough and to spare; and if, under the protective system, they could provide enough for the country, he thought that was a greater inducement why they should oppose a system which left them dependent upon foreigners for their supplies. It was an extraordinary fact, that in countries which had not been cursed, as the modern phrase went, with Corn Laws, where corn was free enough—where, in fact, we looked in severe years for supplies ourselves—he alluded to Poland and some of the Russian states—they were in greater distress than this country was, and we were in a position rather to offer them some of our corn, than to send for any for our support. Now, supposing that League principles had been adopted (and, if they were good, the sooner they had been adopted the better), and that League predictions had been fulfilled—that the poor soils would be thrown out of cultivation—if this had taken place, he would not pause to inquire what would have become of the poor; but he asked generally what would have been the effect if a fifth part of the soil had been given up to sterility in the present condition of foreign States? If this had happened, then they would really have been in the condition in which they were falsely stated now to be, for they required more food than the produce of this and of foreign countries would then together have supplied. So the very arguments, and the very facts upon which their opponents relied upon against them, were the strongest arguments in their favour—in the favour of that fair protection which induced the cultivators of the soil to produce a supply sufficient under any emergency (*hear, hear*). Allusion had been made to the alteration of opinion on the part of Lord John Russell. That alteration had not astonished him. It was true, as had been stated by their noble chairman, that some men would bid higher for popularity than others, and that the recent declaration of the noble Lord was to be attributed to his desire for popular favour. He had indeed prognosticated that the noble Lord would before any long time declare in favour of free trade. He had predicted when the League had—to use a common expression—called him and his fixed duty over the coals, that the noble lord would be dragged into its forces (*cheers*). He was not astonished at it, and he

could assure the society that he did not regret it (*hear, hear*). They ought to know the good and true men (*cheers*). He had observed last session a great deal of friendly feeling between the Premier and Lord John Russell, and he had been afraid of a coalition. This friendly feeling—if it was not quite brotherly love, seemed at least of a nature to soften down what were termed the asperities of party, and he was afraid that they would suffer from it. But now there was no mistake. The Minister must either be in direct opposition to Lord John Russell, or must altogether abandon protection to agriculture (*cheers*). He, as an Englishman, liked honesty and open dealing, and he was glad that there could no longer be any cozening (*cheers and laughter*). He therefore rejoiced, though he olushed for him individually as a man and as an Englishman, for the recent declaration he had made. It was really astonishing (as Mr. Bennett had said) that men could so forget their former principles and take to new views as stepping stones to office. The difference between Lord John Russell, on the subject of protection (upon which principle he stood for Huntingdon) at that period, and Lord John Russell addressing the merchants of London the other day, was so striking, that, with their permission, he would read an extract from his Huntingdon letter. It was dated the 4th January, 1822, and contained the following passage:—"I am inclined to think that if foreign corn were admitted, even if you had scarcely any taxes to pay, it would not be easy for the farmers of England, who require to live in a certain degree of respectability and comfort, to compete with the lords of Poland and Russia, whose vassal peasantry are unacquainted with the wants of a civilised state. Corn is a manufacture (to use the new phraseology) cheaply produced in a fertile soil by wretched ploughs, wretched horses, and wretched men." Now he wished to ask, had circumstances altered in these respects since that period? Was the land of Poland less fertile? were the peasantry of that country, the wretched serfs, in higher condition now, morally or physically? Did they consume now more wheaten bread? Were they now more advanced in civilisation than were the English farmers at the date to which Lord John Russell had referred? If the same difficulty in competing with the lords of Poland and of Russia existed now as had existed in 1822 he could not see how the noble Lord could state that protection—which was then necessary—was now the very bane of agriculture (*cheers*). But the truth was, that the noble Lord had then been the candidate of an agricultural constituency, but now was an aspirant for League support and popularity. Much as he admired the letter of their friend, Mr. Cayley, he could not agree with its last paragraph, in which he expressed a desire to see Lord John Russell in his natural position of a leader of a constitutional opposition. He could not agree in this opinion, for he did not want to see Lord John in any conspicuous position at all (*hear, hear, and laughter*). No; he did not wish to see him holding any public position, for he was a man not to be trusted (*hear, hear*). He wished to see men of integrity in the high places of this country, and he wanted to see Lord John Russell nowhere (*hear, and laughter*). No!

"Proteus, we can never trust thee more!"

(*Laughter*). But there had been rather an amusing statement in the *Times*, to which he wished to refer. The editor, or writer, in the article to which he alluded had treated the agriculturists as if they had no power—as if they were of no use—as if their opinions on this question ought not to be consulted any more than the opinions of the beasts which they fattened for exhibition. But he could assure the writer, whoever he might be, that he reckoned without his host (*hear, hear*). The time had arrived when the opinions of the farmers must avail much, if they had the spirit to bring those opinions into play (*cheers*). They would give him the credit of admitting that ever since the establishment of that society he had recommended the adoption of energetic measures. But now the enemy no longer deceived them. Their enemies thickened around them—the plot grew more and more complicated—but let them be united amongst themselves, and he would guarantee victory to their cause. They had the strength of a giant—they would not, he knew, use it as a giant tyrannously—but if they exercise fairly, boldly, resolutely the power which was theirs, no Minister dare despise it (*cheers*). It was for them to preach and promulgate such doctrines amongst the tenant-farmers in their own districts. Let them not be supine. He entreated them to come forward without fear or misgivings in opposition and in resistance to the danger by which they were threatened. Some few Noble Lords might subscribe to the League, who wished to do by others what they were ashamed to do for themselves; but he saw no more reason why Lord Radnor should not personally interfere in an election—improper and unconstitutional as such conduct would be—than for his not giving money and support to those who did most grossly and indecently meddle and interfere (*hear, hear*). The subject was so fruitful a one, that he scarcely knew how to conclude; but this he would say, that if the society were determined to proceed—and they had given to-day evidence of that determination—he had no doubt that they must succeed. The League had been nearly dead up to the time when the two Noble Lords thought fit to join and resuscitate it, and if they persevered, it would before long die, despite of their patronage and support. But he cared nothing for the League. He did, however, care for, and he must ever protest against principles and conduct that made him think and say that "all men were liars" (*cheers*).

The PRESIDENT then read the resolution. It was put from the chair, and carried unanimously.

WM. MILES, Esq., M.P., then rose and said, that after the way in which the noble Chairman had addressed the society, and in which other gentlemen had followed him, he felt that nothing was wanted to stimulate them to action (*cheers*). For, whatever might have been the signs of the times previously—however grave and portentous they had before been, still the present time they knew to be one in which, unless they all put their shoulders to the wheel—strongly, firmly, determinately—protection to British agriculture was annihilated, for he would not conceal either from himself or the society

what had already been hinted by previous speakers, that the League, by the support and adherence of such men as Lord John Russell and Lord Morpeth, had gained a friend, which they before had not (*hear*). But this he could also say, that, having attended very large and important meetings in his own county (and he could assure them that he spoke the sentiments of the whole of Somersetshire, extensive as it was), he had found the farmers ready and eager to do everything to uphold the entire integrity of the agricultural protection, but they ought not there to content themselves with reading reports, or with making speeches, or with stating that there was not, and that there would not be famine, or with declaring the sufficiency of our present supply; but they ought to set others to work with them—to resist all opposition to their rights—to take a leaf out of Lord John Russell's book, and not only to do so, but to go further, and to do more than even Lord John Russell had recommended to their opponents (*loud cheers*). What he recommended was, that every parish in England should petition against a repeal of the corn laws, and that their petition should state respectfully, but forcibly, their determined resistance to that measure. But he recommended also that they should go further; for if it were the intention of the Government to repeal the corn laws, then he should propose that every parish throughout the country should call upon them to appeal to their constituents, and to try the question by a general election. That was the power which the constitution gave to them, and to that issue he challenged the League, he challenged the Government, he challenged the whole combination of their opponents (*cheers*). In his recent letter to the electors of London, what had Lord John Russell said? He had said, "Let us, then, unite to put an end to a system which has proved to be the blight of commerce, the bane of agriculture, the source of bitter divisions amongst classes, the cause of penury, fever, mortality, and crime among the people" (*loud laughter*). That certainly was pretty strong even for a partisan; but how did the noble lord proceed? "But if this end is to be achieved, it must be gained by the unequivocal expression of the public voice. It is not to be denied that many elections for cities and towns in 1841, and some in 1845, appear to favour the assertion that free trade is not popular with the great mass of the community. The Government appear to be waiting for some excuse to give up the present corn law." Indeed! upon what authority had the noble lord stated that? "Let the people, however," he went on, "by petition, by address, by remonstrance, afford them the excuse they seek." Now, he begged to adopt for them the recommendation of the noble lord. What he required was that, in the first instance, they should petition from all parts of the country. That step was clearly necessary. The next course which he should recommend—if it became necessary—was remonstrance; and if that were not sufficient, then a demand upon the Government to appeal again to the people, and so to determine at once the question whether free trade was or was not expedient for the combined interests of the British people;

for it was not the farmer, but the people, who were benefited by the corn laws (*cheers*). After the addresses which had been delivered, he would only touch upon one point which Mr. Allnatt had mentioned. He said that the League would have been dead but for the support and assistance of Lord J. Russell and Lord Morpeth. Let the farmers of England not so deceive themselves. The League was still using the most active exertions; and it would require all their energies to prevent those exertions from being successful. From what he heard, he was afraid that so many free traders had been placed upon the registration in South Lancashire and in the North Riding of Yorkshire, that it was very doubtful whether they would not carry those elections. He understood that he was to be threatened next, and that the county which he had the honour to represent was to become a great supporter of the League and its principles ("hear, hear," and a laugh). Now, though they could not, and would not, interfere in elections, as the League did, yet much may be done by union, much by the friendly intercourse at market and at farmers' tables, much by energy, perseverance, and determination; and, if they were all united, let them remember the great force they carried along with them in their labourers, who were their 40s. freeholders (*cheers*). Then let them try the question at issue, whether agricultural protection is or is not to be maintained, by an appeal to the country; and for that appeal they would then be prepared (*cheers*). A very clever and active gentleman, Mr. Andrewes, the secretary of a local protection society, had forwarded to him certain resolutions for his opinion; and he thought, with a few alterations, they were so good for a petition, that, without any attempt at dictating to them a particular form, he would venture to read it. This petition would of course do either for the House of Lords or Commons—*mutatis mutandis*. It was as follows:—

"TO THE HON. THE HOUSE OF COMMONS IN PARLIAMENT ASSEMBLED.

"The humble Petition of the Landowners, Tenants, Labourers, and others interested in Protection to Agriculture,

"Sheweth,—That, in consequence of the declarations made by several leading members of her Majesty's Government in the last session of Parliament, indicating that further deductions might be made at no distant period on the already greatly diminished amount of protection now afforded to agriculture, and in consequence of the interpretation put on these declarations by some influential members of your hon. House, as well as by the public press, we deem it expedient to press upon the members of Government and your hon. House that such an impression, whether well or ill founded, is calculated to destroy all confidence in the stability of the present corn laws, and to arrest the progress now making for the permanent improvement of the inferior soils of this country, by which the production of grain has very nearly kept pace with the rapid increase of our population.

"That your petitioners, being practically engaged in cultivation, and employing a large amount of capital and labour in farming, are enabled, from their experience, to state that the frequent diminutions of protective duties which have occurred since 1815 have led to the total loss of a vast amount of farm-

ing capital, and have consequently acted as a bar to the greater extension of agricultural improvement.

"Your petitioners have ascertained from the most unquestionable sources the prices of wheat and other corn during the last twenty-five years in the shipping ports of central Europe, and find that the different descriptions of grain could be imported into the markets of this country at such low prices as must prevent the cultivation of a very considerable portion of the inferior soils of this country.

"That during the operation, and in consequence of reliance upon the continuance of protective laws, a vast amount of capital has been invested in the purchase of lands, in the purchase of leases, in the erection of buildings and fences, and in draining and other expensive permanent improvements, which capital would in many instances be either partially or entirely sacrificed, were foreign corn admitted duty free.

"That the doctrines of those who advocate a free importation of foreign corn have no reference to these circumstances, or to the ruin which must fall on the capital and labour of by far the most extensive interest in the country, but are based entirely on the principle that if corn can be imported cheaper than it can be grown in this country, the cultivation of our own soil should be abandoned.

"That the inevitable consequence of carrying out this doctrine would be the ruin of the cultivators of the soil, and the labourers now employed by them.

"Impressed by this conviction, your petitioners feel it their bounden duty respectfully but firmly to call upon the Legislature, either to uphold in their integrity the present system of the corn laws, or, by an appeal to the constituencies of the United Kingdom, call a national opinion upon the expediency and policy of adopting, or not, the principles of free trade.

"And your petitioners, as in duty bound, will ever pray."

He threw out this for the consideration of the society. He thought that they ought not to separate without doing something. They ought to show the county societies what they should do. He would now, therefore, move a resolution, to the effect "that petitions be immediately forwarded from every parish in the kingdom, praying the Houses of Parliament to take into their most serious consideration the evils that must result from any diminution in the protection to British agriculture; and that the form of petition adopted be similar to that above given."

C. N. NEWDEGATE, Esq., M.P., rose and said that, after the allusions which had been made to the League before the accession to their forces of Lord John Russell and of Lord Morpeth, he was desirous of making a few observations. The League had attacked him in his own constituency, and by a system of perjury and of forgery had nearly succeeded, and would have succeeded if not detected, in reviving dead votes and in creating fictitious ones. The recent support given to the League has arisen from the fact that they stood in need of a diversion of attention. Men's minds had become tired and disgusted with their old talk and their old practices, and to this account might be attributed the new adherents they had gained. They had called in their contingents. It had been wisely done, but it had not been done at a good time. It was quite true, as had been stated, that there was no well-founded fear of famine; but circumstances had rendered a coalition between the

Whig leaders and the League necessary. It was quite unavoidable. It was sure to have taken place. And it was only by individual exertion that they could struggle against such opponents. Every man amongst them must act as detective police. They could not create votes, as did their opponents, if they would; but he would not stop to speak of their disgraceful and underhand machinations. There was a doubt in the minds of some men as to the objects of their opponents; but those objects were obvious enough. The *Times* newspaper had recently attacked all protection societies, and by its description of the farmer, by the contempt it threw on agriculture, by the line it adopted on the whole question, fully deserved the title of a bitter enemy of the agriculturists. But he begged to call their attention to the last paragraph of the leading article of that day. The extract to which he alluded began thus:—"There is, then, some reason to fear an extravagant competition by the British capitalist for the hundred thousand quarters of British wheat still within his reach." What, this under a system that was to exclude all competition? But the article proceeds—"It is a mere nothing compared with the enormous sums available and ready for speculation, or with the sums actually embarked in other speculations of a much more uncertain character." And yet the speculation under the corn laws was a gambling which, they said, was unworthy of houses of ascertained credit. "We believe it to be within the capacity of half-a-dozen merchants of London to monopolize all the redundant produce of the world, both now existing and for years to come—a monopoly far more likely to set up the farmer than any sliding scale his friends have ever given him." This from the uncompromising advocate of free trade! This from the men who have raised the cry of monopoly, who have attempted to saddle that odious name upon men who enjoy only that fair protection which the burdens cast upon them would justify. Was this the object at last avowed—to create a monopoly in the hands of the great merchants of London? How would this suit the farmer? they advocated the principle of buying in the cheapest markets. How would it suit the consumer? they advocated the principle of selling in the dearest (*great applause*). All the article before this was intended to soothe the farmer. They were assured that, if the ports were opened, grain would rise in every market in the world. Who doubted it? and who would profit by the rise? (*hear, hear*). Such were the advocates and such were the instruments which the League found and employed to impose upon the agriculturists. If they succeeded, then he would say that the agriculturists deserved all that was said of them (*loud applause*). He would not trespass upon the meeting further than to say that now he trusted their course was clear; that their enemies were separated from their friends; that they would all now pursue a direct and manly course; that the farmers would not be so short-sighted and so foolish as to suppose that, because prices were remunerating at present, that therefore they would do without protection. He was in a position to confirm the statement which was made by Mr. Villiers in the House of Commons last sessions,

that, on taking an average of years preceding the last, had the ports been opened, the price of wheat would have been 35s. per quarter. How that price would suit the producers of England, he need not tell the agriculturists. Such a price would be absolute ruin to the farmer, yet that would be the price in abundant years; while now, forsooth, if the ports were opened, the price would rise in all parts of the world (*hear, hear*).

Mr. G. J. HEATHCOTE, M.P., wished to say a few words on this occasion. Though he had the honour of being a member of the House of Commons, and an old member too, and had occasionally fought their battles there to the best of his ability, yet he appeared before them as the chairman of a local society. In that capacity he would address to them a few words, and he would take that opportunity of stating that whatever changes might have occurred in the opinions of others, his own were entirely unaltered (*loud and prolonged cheering*). He well knew that they had many difficulties to encounter in fighting this question. Many eminent men on both sides in the House of Commons, he feared, were against them. He feared that the recent declarations of the leaders of the Whigs showed that they were opposed to them; while speeches made last session by several of the Conservative leaders showed that they took far too low a tone—that they, in a great measure, gave up the principle for which the agriculturists were contending. He was aware that great odds were placed against them—that they had to contend with many highly talented men who were against them, but, in the midst of this gloom, there were still some rays of hope to which they could cling. If great personal examples were against them, there were great national examples in their favour. Whether they looked at home or abroad, they would find reasons for hope and for encouragement. If they looked to other nations of the world, they would find that almost all of them had repudiated the doctrine of free trade. This was valuable as an example. The cases of France, Germany, and America, were valuable as examples, and they were also valuable as showing that almost every nation absolutely repudiated the principle of reciprocity. Acting upon that principle, this country had unwisely abandoned many of its best interests; but now we were placed in that position, that other countries absolutely repudiated the idea of a reciprocity treaty with us. If they looked abroad, he thought that the free traders had little reason for congratulating themselves, as they saw so few ready to assist them; and if they looked to this country, to the middle classes, let them speak for themselves. The free traders said that the middle classes were in their favour; he said they were against them. Look to the elections that had lately taken place through the country—they were completely in favour of agriculture, and the result was the same, whether the fight was in a great country or in a great town. So obvious was this, that even Lord John Russell was constrained to allude to it in his letter; and this gave them the hope that they had still the power to defend themselves, if they made the right use of it. There was no reason for a change either on one side or the other. But it was urged that a scarcity was likely

to prevail. Now, he was addressing many who were much more competent than he was to go into local details upon this subject, but he would say, look at the prices which prevail upon this subject. Were they famine prices or were they not? (*great applause*.) They were well aware that in 1800 the price of a quarter of wheat was 113s.; that in the next year it was 110s.; that in 1812 it was 126s. But what said the *Gazette* now? The average for the last six weeks was 58s., and the average for the last week was only 57s. Not only did this show that the price was a moderate one, but it showed further, that the prices were falling; and he believed that for the last month the averages had fallen 1s. a week. But, besides all this, he thought he had heard, in 1842, from the mouth of a very high authority—from Sir Robert Peel himself—that the probable range of prices under his new bill would be from 54s. to 58s. He fancied he had heard Sir Robert Peel say so (*cries of "True"*). Well, were the prices dissimilar now? Could any person say that the present prices were unusual or un contemplated? (*hear, hear*). There was another and a curious fact to which he would allude. The average price of corn had been 56s. per qr. during the greater part of the time in which their honest friends, the Whigs, had been in office. If that price was now to be considered as a famine price, then it was clear that the Whigs had allowed the country to remain with corn at a famine price through the whole of their duration of office (*laughter, and cries of "Hear"*). But all these things did the greatest possible mischief; they frustrated the very objects which the League professed to have in view, for they tended to lower the prices; low prices produced consumption, and thus there was a premature using up of the store of food which, managed with economy, might be made to last till another harvest. Not only that; they would recollect that he was arguing with his opponents on the ground of their own professed objects, but it tended to lower the averages, and thus to make the duty higher; so that a greater difficulty was thrown in the way of the introduction of foreign corn, which they desired to bring in. The farmers had a right to fair and just prices. He said this was just to the consumer and just to the producer. It was just to their producer, that on some occasions the price ought in a certain degree to make amends for years of low prices; and it was just to the consumer, because a certain rise in price prevented waste. As he had already said, whatever opinions others might hold, he maintained those which he had always hitherto done, and he hoped that his constituents, and the agricultural constituents at large, if ever they looked to such a humble individual as himself, would ever find him endeavouring to maintain that just and necessary protection which he believed to be necessary for the maintenance of the agricultural body—in his opinion the most important class in the country (*applause*).

Mr. WEALE did not intend to take up the time of the meeting; but he could not refrain from congratulating them upon the fact that the reports from all parts of the kingdom showed that there was no reason to entertain any apprehension of scarcity. Allusion

had been made to the registrations; and he wished to impress upon his brother farmers the necessity of their registering under the £50 clause. There were many men who were not registered, thus leaving power in the hands of their opponents. An election could not be far distant, when a call for exertion would be made upon all the farmers of England, and he should be sorry to see any of them wanting. He would, therefore, recommend to the farmers that every man who had an opportunity should register. He hailed with delight the letter of Lord John Russell, because it showed him at last under his right character. He had hitherto been playing his part under a veil, so that they could not see him; but now they found the noble lord paying homage to the Lord Mayor of London, and truckling to the citizens, because he knew that an election was coming round; and with all his talk about philanthropy and the duty of finding cheap food for the starving poor, he knew that he stood a good chance of being served in London as he was served in Huntingdon (*loud applause*). He knew that the intelligent and reflecting portion of the population were against him, and he thought he could not too early take the field to say that he was against the corn laws. But he (Mr. Weale) believed he would, after all, find he was mistaken; for he had reason to think that a good man would stand against him, and he hoped would turn him out (*loud applause*). One fact had been alluded to of great importance to graziers—the feeding of cattle on malt. They were told that the importation of cattle under the tariff would do the British grazier no harm. Now it appeared that the first year there were 1,100 cattle imported, in the next year there were 2,900, and last year there were 11,000. This was a fact of great importance. Why did they find the Belgian and other foreign breeders going round the country and purchasing the best bulls and cows they could procure? Why, but because they had been in the markets of the metropolis, and saw the kind of cattle that were wanted there, and were now endeavouring to supply them. They were told that they might easily compete with foreigners in the breeding of cattle. But to show the meeting the disadvantages under which the British grazier laboured, it would be enough to state that they were prevented from converting their inferior barley into malt. The foreigner was not prevented from doing so; but in consequence of this prohibition, the British grazier was compelled to purchase oil-cake, which was the produce of another country. Look at the large quantity of barley in the market that was not fit for malting, a large proportion of which might be usefully converted into malt for feeding cattle (*hear, hear*). He hoped these remarks would go forth, and that the whole agriculturists of the kingdom would be ready to fight their battle under the leadership of their noble Chairman, who had fought and bled for his country (*loud applause*). They were now told that the time for action was come; he had long been of opinion that the time was come, but as it was now the general opinion that the time was indeed come, let them show their enemies that the English yeomen were fully prepared to meet them (*cheers*).

Mr. UMBERS, of Warwickshire, hoped the tenant

farmers would be unanimous now, as they had been on former occasions. But there was also a duty which the landowners of England owed to their tenantry (*loud applause*)—a duty which they really ought to perform, as without their assistance at the labours of the tenantry would avail nothing. He had no doubt that if the landed proprietors of England were to come forward, and take their proper places on the question, England would supply them with weapons, which would effectually vindicate their rights, as well as essentially secure the interests of the country. They might be assured that their only mainstay was the yeomen of England. In the case of internal emergency, who were relied upon to preserve the public peace but the yeomanry? (*Hear, hear.*) He wished this meeting would resolve to call upon all the principal landed proprietors of the United Kingdom, who were not already members of the society, to become members, to carry out the purposes for which the society was founded. He concluded by moving a resolution to the effect that it was the opinion of the meeting that every principal landed proprietor in England, Ireland, Scotland, and Wales should be written to by their secretary, and requested to become a member of this society, in order to oppose the efforts of the League for the total repeal of the corn laws.

Mr. G. SHACKEL seconded the motion.

Mr. BOWYER, of Cambridgeshire, said he was sorry that no person had attended from the fen districts to express their opinion to the society respecting the state of the crops in that quarter. He had attended a meeting of a society where there were twenty-one farmers in the fen districts, farming among them 6,600 acres of land; and from questions which had been put to them and the answers they had returned, it appeared that last year the produce of an acre was six-quarters of wheat, that on an average of the preceding seven years it was four quarters, and that in the present year the yield was three-and-a-half quarters. This was borne out by the returns made from the great market in the fen districts—the market of Wisbeach, where 4,000 quarters of wheat had been sold on an average of the last twelve weeks. This showed that there was no great deficiency in the fen districts; and when he heard these men say that the deficiency in their locality was only 1-8th while all the gentlemen present stated that in their localities they had a full average crop, he contended that under the present system of Corn Laws the present prices could not be supported, that it had been got up by false reports, and that it would not be supported.

Mr. HEALY, of Lincolnshire, was also desirous of confirming what they had heard from all quarters regarding the competency of the present crop. In the county in which he lived, and on his own farm, which was a tolerably extensive one, there was no cause for any alarm regarding deficiency or defalcation, which did not exist in former years; and the disease in the potatoes had in a great degree abated. He quite concurred in the observations which had fallen from Mr. Umbers. If the landed interest would do their duty, they might depend upon it the yeomanry would do

theirs; but if they did not boldly come forward, they could not, and would not, be supported. If the yeomanry thought rightly, they acted weakly. They were good soldiers, but bad officers. They were well able to follow, but they wanted leaders to guide them. But if properly led, their power was greater than was generally expected. Though they were scattered, yet they were all over the country. There was no nook in any part of the country where some man of intelligence and respectability as a farmer did not reside. If the landed interest did not support the farmers against the coalition of the Whigs and League, they would lose their estates. He ventured to say that the question was a vital one to the landlords. The farmer would be beaten first, for the landlord could only be struck through the side of the farmer; but the farmer could fall back on his industry; but if the landed interest were deprived of their rents and estates, what would become of them? He said to the landowners of England what Madame Roland had said to the *Brissotins*. "If you do not destroy the League, the League will destroy you." So he called upon them to join in a strong pull, a long pull, and a pull altogether (*hear*).

The PRESIDENT here suggested that the resolution before the chair, proposed by Mr. Umbers, should be left for the consideration of the committee. The committee quite understood that the society were desirous that every exertion should be made, but he feared by the motion of the hon. gentleman too large an increase would be made to the revenue of the Postmaster-General.

Mr. UMBERS very willingly acceded to the suggestion of the noble duke, and the resolution was therefore withdrawn for future consideration by the committee.

A. STAFFORD O'BRIEN, Esq., M.P., rose and said, that in his opinion Mr. Umbers had very wisely left his motion for the consideration of the committee; but, at the same time, he thought that he had also acted wisely in bringing it forward. (*hear, hear*). With regard to the general objects of the society, they had two remarkable statements before them. The League stated that this was a landlords question, and the tenant-farmers had that day and at other times stated that the landlords did not take up the question as they ought. These were antagonist assertions; but he began to feel, that if assertions of perverted truth, of perpetual falsehood—assertions exciting popular feelings and public sympathy—if they met all this by conduct very quiet and very gentlemanly (as the landlords were very gentlemanly and very popular in their own districts), he said distinctly—and this he knew was the opinion of the farmers—it was not sufficient (*loud cheers*). Whatever happened between this and the meeting of Parliament, there was a call on the landlords of the country, not merely in reference to their own interests and the interests of their tenants and their labourers, but for the sake of those institutions upon the stability of which this country depended, to come forward and to state the high grounds upon which they advocated the continuance of agricultural protection; and then let the general election, which might be near at hand and could not be far off, settle whether their opinions were responded to by the country (*cheers*). On the whole, their present meeting had been a satisfactory one. If they disbelieved

the report of the *Times*, their position was still difficult. The report stated to them the minorities in which they had been left on questions affecting agricultural interests last session; but now, when they found the League not merely existing by a cry of clamour, but that it had cleared all neutral ground, and that it ranked amongst its supporters, the leader of a great constitutional body, as well as many other noble lords, the position of the agricultural interest was a different one; and while they could not complain of the past, they might at least expect more resolute and determined conduct on their part for the future (*cheers*). They had inadvertently forgotten a formal part of their duty, which would now be performed—and no doubt eloquently performed, by Mr. F. Hobbs (*hear*).

Mr. FISHER HOBBS then said that it afforded him very great pleasure to propose that his Grace the Duke of Richmond be president of the society for the ensuing year. From his high ability—from the manner in which he was beloved by the farmers (*cheers*)—from the manner in which he was universally esteemed, no man could be more fit for the position than was the Duke of Richmond (*cheers*).

Mr. G. TURNER seconded the motion. He felt assured that they would all agree with him, when he said that there had never lived a gentleman better calculated from his personal worth, his rank and influence, for the office of President of the Agricultural Society than the noble duke, whose nomination he felt great pleasure in seconding.

The motion was then put by William Miles, Esq., M.P., and carried by acclamation.

The Duke of RICHMOND said that no thanks were due to him for the course he had pursued with regard to agricultural protection; for it was his opinion that by that alone this country could continue free, enlightened, or independent (*loud cheers*). He accepted with pleasure the office of their president, and thanked them for the manner in which they had conferred it upon him. In the station which he held, and entertaining the strong opinions he had always expressed, he had been open to a good deal of abuse and calumny, but he had never thought it worth his while to answer the attacks made upon him. He had not done so for two reasons—first, because he was quite aware of the benefit of a free press, and he knew that the editors of newspapers had not time to analyze every statement sent to them, or every attack they inserted; and they frequently put them in, knowing that public men were not very sensitive upon the subject (*hear, and a laugh*). His other reason was, that he had always mixed a good deal with the tenantry of England, and he had never attended any single meeting in which he had not met with strong expressions of their regard for, and attachment towards, him, showing that they thought him determined to pursue an upright, independent, and straightforward course (*hear, hear*). In conclusion (said the noble duke), I ask you to exert yourselves. I can do but little, but if we bring together and unite the free-born Englishmen, the yeomanry, the strength of the country, this society may lead to success (*loud cheers*).

The Rev. Mr. GWILT rose to propose that his Grace the Duke of Buckingham be appointed vice-president,

and that the former trustees and members of the general committee be re-elected. He had great pleasure in proposing this resolution; for, after what had fallen from the noble duke in the chair, and the assurances which he had given of his strong support of the agricultural interest, and with the assistance of the noble Duke of Buckingham, with whom he had acted for several years in protection societies, and knowing well the interest which he took in agriculture, he could not but congratu-

late the society on the support which it had received. They had no reason to despond so long as they could command such a gathering as they had seen that day, and remained determined to protect the interests of agriculture (*cheers*).

The resolution was agreed to.

Thanks were then voted to the chairman, and the meeting broke up.

ADDRESS OF THE AGRICULTURAL PROTECTION SOCIETY TO LANDED PROPRIETORS.

At the annual meeting of the Agricultural Protection Society, held at No. 17, Old Bond-street, on Tuesday, the 9th of December, the following resolution was proposed by Mr. UMBERS, of Warwickshire, and seconded by Mr. G. SHACKEL, of Berkshire:—

“That, in the opinion of this meeting, every proprietor of land in the United Kingdom should be communicated with, and solicited immediately to become a member of this society, and to oppose by every means in his power the efforts of the enemies of protection to British industry.”

ADDRESS.

The above resolution was unanimously adopted at the annual meeting of this society yesterday, and it has become the duty of the committee very earnestly to press upon your consideration the grave and important truth to which it alludes. While this society was acting in opposition to those reductions of duties which were proposed by the present government, it could not be denied that many friends to protection were unwilling to aid our endeavours, believing either that the reductions themselves were of comparatively minor importance—that the evil of breaking up a great political party was the evil most to be feared, or that concessions to the advocates of free importation were likely to be fairly met by them, and to abate the zeal of many for the total destruction of the system of protection. But now that Lord John Russell, the head of the Opposition, has announced himself, and with him, of course, his party, fully prepared to carry out the immediate repeal of the corn-laws, we feel that no motives such as those mentioned above can deter you from aiding our endeavours. You will observe that the question is no longer as to the cautious modification, or even the gradual removal of duties. It is no question as to the consideration of our system of taxation, or as to negotiations on this subject with foreign powers. It is no question even of free trade; it is simply and only a question of free importation. As opposed to such a system, you, landowners of England, have assisted to return a House of Commons so strongly protesting against it, that your enemies have named it the Landlords' Parliament. Your tenantry stood by you in array, as was believed, invincible. A great modification of the then existing corn-laws, and a great diminution of protection, has since been made—

whether wisely or unwisely it is not for us to say. But you will remember that two years ago the tenant farmers of England rose as one man in opposition to a most active and wealthy society, which, however it has been taught the wisdom of comparative decency in language, is still actuated with the same determination that has ever animated it to destroy that social and political influence which this country has, from immemorial time, reposed in those connected with the land. In obedience to the voice of the tenant farmers, this society was established. We have no wish to claim your approval of our formation or of our conduct; but we must tell you that one unceasing complaint has been made to us, by the farmers, of your apathy—of your neglect; and while on the one side your enemies have been declaring that the maintenance of corn-laws was a landlords' question, your tenants have been complaining bitterly that you were leaving them to fight a hard battle by themselves.

Whether the altered circumstances of the times may persuade you to alter your conduct, the next six weeks must show; but we should be wanting to ourselves, and to the tenant farmers, and to the cause we have espoused, if we failed now to remind you that unless the tenantry of England are led by those whose privilege and responsibility it is to lead them, they will seek for leaders elsewhere, and too soon they will find them. The farmers are not to be coerced; but they look up to those their fathers looked up to, and they require them, in times of emergency like the present, to prove themselves not only good landlords—not only kind neighbours—but firm patriots and wise, bold leaders. It is so easy to attribute existing evils to existing laws—it is so easy to distort the facts of the past, and to give bright prospects of the future—that no institution in this country can be maintained unless the arguments for its maintenance be rested on high, strong grounds; and when we consider how active the enemies of protection have been, and how passive its friends, our wonder is, that no farther inroads have been made on the good sense of our fellow-countrymen. Doubtless this question has occupied your anxious thoughts—doubtless you have approached its consideration divested, as far as may be, of self-interest or party prejudice. By this time your minds must be made up. If you believe that our highly artificial state of society

could bear a shock so great as that proposed by Lord John Russell, we can only say that we respect your motives, and earnestly wish that the results of such an event may be what you hope, rather than what we fear. But if you have searched history in vain to discover prosperity arising from such a revolution—if you have considered our colonial empire in connexion with our home industry—our national debt, our local taxation, our church, our monetary system, the capital expended, the engagements contracted, the stake perilled—and have come to the conclusion that Lord John Russell's plan is what the last prime minister characterised such a one to be; then we call upon you to remember the honourable position you occupy socially and politically, and not, through fear of obloquy or dislike of active exertion, to shrink from asserting its rights by fulfilling its duties.

Whether or no you join this society is comparatively of little moment; but you belong to a nation that speaks the truth and bears to hear it spoken, and we know that we shall not offend you when we earnestly implore you to join, whenever you can, the English tenant farmer. He will express strong opinions to you; he will ask you to aid him in demonstrating how anxious he is to be still what the yeomanry of England have ever been. Let your presence cheer and your voice animate him wherever he may wish to meet you; and do not let it be said that the class to which you belong was obstinate to maintain that which it was unable to justify, or that by a supineness akin to treachery it lost at once its character, its station, and its property.

17, Old Bond-street, Dec. 10, 1845.

MR. CAYLEY'S SECOND LETTER TO LORD JOHN RUSSELL.

DEAR LORD JOHN,—Somewhat exhausted with my first effort, but in nowise disheartened, I appear, I trust, to time; and as compensations mercifully surround us on every side, even for the worst calamities, so this few days' interval which an infirm state of health demanded for repose, has brought with it the satisfactory reflection that, after all, in this urgent crisis of his fate, you are, perhaps, among the most useful of the farmers' friends. When every day, and almost every hour, was to him pregnant with alarm that your great rival—who, as minister, with your help as leader of the Opposition, really has, unfortunately, the power to alter [the corn laws—was issuing forth his awful fiat for their final doom—forth you rush with all the noble bearing, with all the high-wrought chivalry of an approved and redoubted knight of old, impetuous and self-devoted, to their rescue! From the farmers of England—a thousand times repeated thanks, for the gallantry you have displayed on their behalf! You have taken the lead out of the hands of the minister, who, in fealty to the great party through which he governs, must disdain to follow you in the path to which you so significantly point. You have bound him under the heaviest recognizances—those, at least, of self-love—to preserve the scale of duties on foreign grain, as by law established, until Parliament meets—when the elastic and self-acting principle of that scale will have accommodated itself to the public wants, and when every cause for clamour, as I trust, will in consequence have passed away.

On the probable supply of corn, through the medium of the corn-laws, I have already spoken. What is the short history of those laws? Is it true, as has been asserted, that they are an invention of late date, suggested by the cupidity of landlords for their own enrichment, at the expense of the stomachs of the people? This is, indeed, one of the many plausible weapons employed against them. But what is the truth respecting the origin of the corn laws? The farmers of England, from the Norman conquest to the year 1436 (*i. e.*, for above

350 years), were absolutely prohibited from exporting corn to the continent. This corn-law could scarcely have been invented by the cupidity of landlords! In 1463 (from which year may be dated the principle of the present corn-laws), as some compensation to the farmers for being prevented exporting their corn to what market they pleased—in 1463 the importation of corn underwent a modified restriction. This modification consisted, not of a fixed [duty, but a *sliding-scale!* This act, with slight alterations, continued—nominally, at least—in force for about a century; when, in 1670, an act was passed which prevented the exportation of wheat after it rose to 53s. 4d.; and imposed prohibitory duties on wheat (and on other grain in proportion) till the price rose to 53s. 4d.; and a duty of 8s. between that price and 80s.! By this act, passed 175 years ago, we have a far more stringent protective corn-law (especially taking the general prices of those times into the account) than the present. And, curious enough, we have in it a combination of the sliding scale; and of your quondam favourite fixed duty of 8s., between 53s. 4d. and 80s.

From this account of the corn-laws, from the Conquest to 1670, how does it appear that they are an enactment of late invention? By whom, and by what circumstances, was the landed interest of that time driven to seek for increased protection, by increased duties on the importation of corn? Mr. Porter, of the Board of Trade, in his useful digest, tells us that from a very early period the woollen manufacture has been an object of the especial protection of the English government; and that the exportation of English wool, in 1660, was strictly prohibited. This law remained in force till 1825, when the woollen manufacturers no longer required it. The prohibition was grounded upon the belief that the long staple, or combing wool of England, would secure to themselves the exclusive manufacture of certain fabrics. So that we now see, that the higher duties upon the importation of corn, obtained by the landed interest in 1670, was by way of compensation for the prohibition

of the exportation of their wool, which the manufacturers of woollen had obtained in 1660, ten years before. Do we hear of the landlords opposing the protection sought for by the woollen manufacturers in 1660? They only appear to have asked, in return, for an equivalent protection for the land.

It thus appears, that the object of the woollen manufacturers, in commencing the modern system of restriction on trade, was to secure to themselves a monopoly. Were they content with simply obtaining the prohibition of the export of English wool? Alas! not so. In progress of time they caused it to be enacted, that the punishment of death should be awarded to the English grower of wool, if he dared to export it; and, alarmed at the rapid progress then being made in Ireland in that branch of industry, the woollen manufacturers induced the Houses of Parliament to interpose with the king (William III.) for its suppression.

In his answer to their address, he makes the following promise:—"I shall do all that in me lies to discourage the woollen manufacture in Ireland, and encourage the linen manufacture, and promote the trade of England." And well has it been promoted; and at the expense, as it appears, of poor Ireland. Until enabled by protective laws to stand alone, it appears to forget the means of its own rise, or to extend to others, when they want it, the help which, in its need, was extended to itself. The other branches of our manufactures had their origin under a similar system of protection.

The woollen manufacture having thus sprung from the practice of prohibition, from the desire of monopoly, we shall in the end perceive that a similar desire, viz., that of monopoly—acting only under a different name—actuates those connected with it (as well as those connected with its sister, the cotton manufacture), who in the present day are so strenuous in their efforts in favour of free trade.

In the year 1773 a new act was framed imposing a nominal duty of 6d. on the importation of wheat, whenever the home price was at or above 48s. per qr. Another sliding-scale! In 1791, another act was passed, which admitted foreign wheat at the duty of 6d., after the price rose to 54s. per qr. Under 54s., and above 50s., the duty was made 2s. 6d., and under 50s. a prohibiting duty of 24s. 3d. was imposed. A more flagrant instance still of a sliding-scale! This act was succeeded by the acts of 1804, 1815, 1822, and 1842.

This account of the corn-laws, more tedious than was intended, at once disproves the assertion which charges them of being an innovation of modern date; whilst, on the contrary, it shows that protection to domestic industry, and restriction upon importation, has been interwoven with our agricultural, commercial, and manufacturing system for many hundred years. When was this ancient system of trade and agriculture—the system under which our commercial greatness sprung up—first prominently invaded? Since the war of the French revolution. But since the system of protection has been tampered with, has England been more prosperous than before? Assuredly not. In the three instances of shipping, silks, and gloves, in which the old system has been specially broken in upon, what has been

the result? Universal complaint, and a desire by the interests involved to revert again to the ancient system. Was this invasion of the old system of protection resorted to at the suggestion of practical men, to effect a remedy of some acknowledged distress or evil in these three trades? No! they were selected as the victims for experiment of a new school of political philosophy—that new school, which, in quaint, but no measured terms, you in 1822 emphatically assailed. Twenty years of experience have changed your opinion; but it is surely not the success of the experiment of the new philosophy in the three instances just mentioned that has changed your opinions; for in these instances the experiment has signally failed. Have you learned to place more faith in speculative opinions?

Who was the modern instigator of these new experiments on the trade and agriculture of this country? Mr. Ricardo. It was this gentleman, a writer of great talent no doubt, on whom the Legislature leaned for guidance in the great monetary change of 1819; and from whom it gathered its conviction that that change would not produce an effect upon prices of more than four cent. If we are credibly informed, he himself subsequently acknowledged, before his death, that the effect upon prices had been 30 per cent.; as you yourself, in your excellent work on the constitution, also assert; although 50 per cent. reduction in prices was far nearer the truth—to the untold misery of the industrious classes, and the incalculable destruction of the property of this country. Does this gigantic error, committed by Mr. Ricardo, by which he betrayed his country into a state of wretchedness, which impelled it to seek relief in political changes, and was the proximate cause of the peaceful revolution of the Reform Act—the safety-valve of a people, fortunately so long accustomed to the use of liberty, as, even in their anguish, not to be induced to abuse it—does this gigantic error of Mr. Ricardo give us confidence in his wisdom, or implant faith in him as a teacher, or offer us an inducement to persevere in his system? And yet he, with his disciple, Mr. M'Culloch, are the real parents of the present agitation for a repeal of the corn-laws. Mr. Ricardo, too, recommended a sliding-scale! but a sliding scale very much of the nature of your fixed duty; which was to slide away to nothing at all.

Mr. M'Culloch also, some years ago, gave utterance to a dogma which can hardly be said to found for him a claim to the character of a sound political philosopher; and yet, under his chair, sat most of the Whig converts to free trade of the present day. This new dogma, if I do not strangely forget, was that, on no grounds of political economy could it be shown that the residence of an Irish landlord was a benefit to his country dependants. Fortunately this was a specimen of a fallacy so glaring, and so immediate an insult to the common sense of mankind, as to require but little time to dispel it. In this case I will concede to you that the people of both England and Ireland preferred the fixed duty of residence to the vanishing point of absenteeism! Mr. M'Culloch has probably changed this opinion; and he appears also to have changed another relating to the manufacturing system; which, in the last edition of his "Political

Economy," he considers to have expanded to so dangerous a degree, that if the Legislature could have foreseen the extent our manufactures would have reached, it would have hesitated before it had lent any stimulus to its progress. And yet, to the still further expansion of this overgrown manufacturing system, are we required to sacrifice the corn laws! What conclusion does Mr. M'Culloch come to, under his present apprehension with respect to the over-expansion of our manufacturing system? To go back—or to endeavour to limit their progress—or to become stationary? Not at all! but he concludes, that having gone thus far (whatever the danger may be), we cannot recede, and that we must go on! This is surely on the principle of that illustrious philosopher, of whom we have heard in our nursery rhymes, who, having jumped into a quickset hedge and scratched out both his eyes—and who (like a philosopher) having seen that his eyes were out, proceeded (most philosophically, certainly—but)

"——— with all his might and main
To jump into a bramble bush,
And scratch them in again."

Do not understand, from this momentary tone of levity, that I am intending to speak disrespectfully of Mr. M'Culloch, or in disparagement of his real merits, which are those perhaps of the most eminent and laborious statistician of his day. But certainly the errors into which he and Mr. Ricardo must be confessed to have fallen from the changes their opinions have been shown to have undergone, and after the suffering their country has passed through in consequence of being guided by the opinions of speculative writers like them, that country may reasonably hesitate before it again exposes itself to the wish of being influenced by suggestions of theory, instead of abiding by long-established principles of acknowledged benefit.

Neither would I be supposed to derogate, by what I have said, from the attributes of genuine science, when founded upon induction; nor from the high respect due to the character of a real philosopher, who, in a spirit of patient and cautious perseverance, and with all the earnestness and the high intelligence of genius, follows after knowledge that may benefit his species, or that may lay open to the admiring gratitude of the creature the merciful wonders of an allwise Creator, but who yet proclaims what appears to him a discovery with all the candid simplicity and hesitating modesty of childhood—from such a character, instead of daring to derogate, I can conceive of no inferior tribute to be paid to it than that of the deepest veneration and love. But the speculative conclusions of even such a man should be adopted by any legislature with the utmost caution; for he deals with materials of a much more mysterious and complicate and evanescent character than those which are the subjects of the purer sciences; where the obstacles can, with comparative ease, be *a priori* detected. Yet even in mechanics, one of these latter sciences, we hear as an axiom, at the patent offices, that out of one hundred patents taken out, although fifty are on the average true in principle, so little do the most ingenious men foresee the difficulties in their way, only ten out of the hundred

turn out true in practice. What a lesson to speculative political philosophers of the present day! Since they cannot forget that, as regards the practical concerns of any great nation, we have as yet no experience of free trade, so that their views of it, in application to this country, must be purely hypothetical.

The philosophy, so called, which, as it appears to me, deserves to be suspected, and which is not a genuine but a false philosophy, is one which on too limited experience too hastily assumes conclusions, and too hastily, if unopposed, would proceed to carry them into operation. This has been the fault of, and the cause of, the suspicion attached to the dogmas of the economical school of this age, from which, as has been said, has emanated the change which did take place, with such dreadful results, of the monetary system, and which is proposed to take place in the system of protection by a repeal of the corn-laws. And surely it is a wise provision that the great mass of the people should view with a sceptical mind any novelties which have not the test of experience to support them. In return they are branded, indeed, by the advocates of such novelties, as governed by prejudice or self-interest. The feeling of self-interest, although, when exercised within proper limits, designed apparently as one never-failing means of individual protection, is, indeed, too apt to warp the better judgment of most of us. But the term prejudice is often too indiscriminately applied, and after all is of rather an uncertain character, for what is prejudice to-day was firmness yesterday.

How has prejudice arisen? It is an opinion very generally entertained for a long period of time, which men are unwilling to surrender. It was once a novelty, at first resisted by a previous prejudice, which only gave way to the present prejudice; because the latter, after long careful sifting—an anxious winnowing of the chaff from the corn, and after long repeated discussions over the family hearths of an entire country, was accepted by the concurrent conviction of the age. The opinion thus carefully examined (although not in itself absolutely true), is more likely to be suited to the temper, taste, and condition of a people finally adopting it, than any new opinion backed by authority, however commanding, which has not undergone the same process of national elaboration; and, although passing under the name of a prejudice, will continue to be received by the majority until some new doctrine, after having received the same sort of investigation, shall better recommend itself to their suspicious convictions. Under what heavier infliction could a country suffer than to be exposed, without delay, to the operation of every crude sophism that was suggested to it? If Providence had intended each new dogma to be carried into operation as soon as invented, some machinery would have been contrived of a different kind to the slow conviction of the mass of mankind. The very tediousness of the operation of producing a general conviction is evidence that the great affairs of humanity were to be entrusted to the care of the slow and safe progress of experience, rather than to be blown to and fro by every wind of doctrine; and thus it may be taken as an axiom that the commonest prejudice has, *primà facie*, a better chance of being

relatively true than the most specious novelty, until the latter has undergone the anxious examination which the former has done before it has been accepted.

From hence I would not be thought to prejudice the case of those who would repeal the corn-laws, because it is comparatively a novelty; but rather as intending to show that what may appear a prejudice in resisting anything new, however attractive to the eye, may have some foundation in nature and reason; and I have been thus tedious on this point, because anxious to prove that, on purely hypothetical grounds, it is dangerous to found alterations in laws which involve extensive interests. In such instances the plain, common, unperturbed sense of mankind, acting upon approved experience, is the only safe and satisfactory guide. Nor would I be thought to infer that, because speculative men have committed many mistakes, the proposition for a repeal of the corn-laws must necessarily be untrue. No! on its own merits it must stand or fall; and on that basis I proceed at once to treat it.

You may tell me that the manufacturers are practical men, and that they should know their own interests. If I concede this point, it is one which to me, as an agriculturist, has frequently been denied, when I have advocated the corn law. My answer to you, however, is, that if the manufacturers are practical men, and if it be an undisputed axiom in that influential class, that the corn laws are so disastrous to their interests, why don't they all unite in condemning those laws? We learn, on the contrary, from members of the manufacturing body, that in various towns from which petitions proceed against the corn laws, half, if not more, of the manufacturing interests of such towns (especially if the capital embarked be taken into the consideration) have refused to sign such petitions. You may reply to this, that it is their Conservative opinions that prevent their signing. I might answer, that Whig opinions may lead others to the opposite course of signing them. But it may appear presumptuous in me to remind you who have so long had a seat in the House of Commons of the notorious fact that when constituents (in times of election so ardent on points of political difference) come to London, to superintend a private bill, their interest in public questions is for the most part swallowed up and absorbed in the private business on which they are come up, whilst to general politics scarcely a reference is made. Surely this is evidence that a large body of the manufacturers would not, on political grounds, forego the expression of an opinion that was so favourable to their private interests, as some represent a repeal of the corn laws as certain to prove.

The benefit to accrue from a repeal of the corn laws is, therefore, amongst the manufacturing body itself, a disputed point; and that it is so, we must be convinced, at least until Lancashire sends to Parliament four opponents of the corn laws, instead of four supporters of it; until the West Riding sends two opponents instead of two supporters; and until the borough of Leeds (with as upright and powerful a provincial journal as any in the kingdom to support their cause) sends two opponents of the corn law, instead of

one opponent and one supporter of it. What the result may be at another election—when the anti-corn-law party, unwilling to trust their case to the verdict of the old constituencies, numerous though they be, have established a number of new voters virtually pledged to their views—it would be difficult to say. Those who would swamp the peerage, may object as little to swamp the constituencies to gain a point. Be that as it may, 2,000 of these votes of the anti-corn-law party are said to have been already purchased in the West Riding of Yorkshire. And I, for my part, cannot see what there is in the law to prevent them. I am not objecting to the purchase of small freeholds to give votes, but rather intending to show the distrust the anti-corn-law party evince of constituencies not of their own creation.

Then, if we turn to the members for London, we find the three supporters of the corn-laws, and one distinguished opponent of them—yourself; but only by a very narrow majority returned. Turn, then, to Liverpool: two supporters of the corn-laws not only represent it, but I have heard from both of them very able speeches in their defence. The manufacturing body being divided upon the question, and the two greatest emporiums of commerce (arguing from their representation) being in its favour, and from the nature of their transactions more likely to be competent judges upon the subject than manufacturing towns, it cannot be said that, among practical men, *i.e.*, men practically affected in their business by the operation of the corn-laws, that there is an undisputed opinion in favour of their repeal. If, indeed, we may infer anything from the calculated effect of even a 1*s.* duty on corn, it would be surprising to find this uniformity of opinion; for it would amount only to a 1-132nd part, or $\frac{1}{132}$ of 1 per cent—*i.e.*, the buyer would have to distinguish between goods worth 132*l.* and 133*l.*—supposing the produce of a man's hands, with 50*l.* per annum, to be worth 100*l.* To a gentleman, however, of great authority on such questions, I put, a few years ago, this question—What would the effect of a 1*s.* duty on wheat be on the sale of manufactures? His reply was, that it could not affect the price of the commonest goods—say such as are worth about double the price of the most ordinary unbleached calicoes—more than $\frac{1}{4}$ of 1 per cent. To which he added, “One-half at least of the cotton manufactures of Lancashire and Yorkshire have voluntarily imposed on themselves a tax of equal amount, by opening accounts with joint-stock banks; they never having such before 1826.”

If the corn-laws do not affect the price of manufactured goods more than from $\frac{1}{4}$ to 1 per cent., or if our manufacturing competition with foreigners is run so close as to leave us a superiority of barely 1 per cent., it surely would be a gratuitous prodigality to run the risk of ruining the great landed interest of this country—a source of wealth and employment of which no foreign jealousy could forcibly deprive us—on the remote chance of maintaining so doubtful a struggle.

It will be replied to this, that our own restrictive

policy, especially in the shape of corn-laws, has produced this foreign jealousy, and that they are the cause of our manufacturing difficulties. In answer to this latter objection, I have before shown that it was under a protective system that our infant manufactures were allowed to grow up, and under which they were preserved from the destructive effects of a competition, which, had they not been thus protected, would in all probability have nipped them in their bud. I answer, also, that it has been under the system of the corn laws that our manufactures have advanced with such rapid strides to their present degree of eminence. In 1662-3, just before the modern corn laws were enacted, the official value of our exports was 2,022,812*l.*; in 1834 (the last year I can at this moment refer to) the official value of our exports was 79,823,093*l.*; they are now probably more than 100,000,000*l.* in official value. Does this amazing increase point to great evils in the system under which it has taken place? Many of those who are loudest in their demand for a repeal of the corn laws have, in one life-time, sprung from comparative indigence to riches and power, and some even to seats in the Legislature, of which their intelligence and energy make them most efficient and worthy members. Do these facts, however, look like the corn laws obstructing the progress of the country's wealth, or the rise of honest intelligence to its proper station?

Then with respect to the charge that the corn-laws have excited foreign jealousy. The Zollverein is stated to be the fruitful offspring of British restriction on the importation of German corn. In reply to this assertion, one of the principal merchants of Frankfort communicated to me the information as a fact, with which he was well acquainted, that the German Custom-duties Union had its origin in purely political and social causes. This view is certainly supported by the extraordinary circumstance that, when Sir Robert Peel, in 1843, relaxed, by his new tariff, the duties on a vast number of articles of commerce, and had the year before also diminished the duties on corn, the significant reply he received, from so many different foreign countries, was six retaliating tariffs, increasing the duties on articles of British production. This bears with it no appearance of those countries anxiously awaiting the diminution of the duties of the British Custom-house, in order at once to allow increased facilities to British manufactures entering their dominions. Is it not far more reasonable to suppose that, viewing, perhaps with envy, the mighty struggles made by England in the cause of European freedom, proceeding as they did from the combined agricultural, commercial, and manufacturing resources, they turned to the page in her history which should discover to them the origin of so much power concentrated on so small a surface, and that they found that it had grown up under a system of protection to industry? And having learnt the lesson, is it surprising that they should have acted upon it?

But, it is further urged, that if we will only consent to import foreign corn, since it will not be given to us for nothing, our manufactures must be sent out in

exchange. This is true: but what is the course and the manner of this exchange? The countries from which we could derive the largest supply of corn, do not want, and will not take our manufactures. They are cherishing their own manufactures; and they demand gold for their corn. But the gold must be bought with something! Yes, it is bought with manufactures. But what is the course and the consequence of this purchase? We already send as many manufactures to those countries that will receive our manufactures as they wish to take; but in order to buy gold to pay those countries for corn which will not take our manufactures, we must send more manufactures to buy gold to those countries that are already supplied with our manufactures. In other words, we must, in order to obtain gold to pay for foreign corn, so deluge markets, already full of our manufactures, with a repeated dose of them, that we should so depreciate the value of the manufactures exported as that the additional quantity thus exported would, on the whole, produce no greater return than the first quantity sent out in answer to the legitimate demands of trade. I leave entirely out of the question, for want of space, the effects upon our monetary system of this hide and seek after gold, although that evil alone, experience has taught us, is of itself grievous enough to bear.

After all, the most specious and plausible pretext for a free importation of corn (its liberality is another question) was the late lamented Lord Spencer's; and, if true, would certainly be the cause of little or no national pecuniary loss, but the contrary. Allow foreign corn, said he, to be introduced, and it will so raise the price abroad that, while the injury to our home growers will be as nothing, the rise in the price abroad will necessarily so raise the price of foreign wages as to make it impossible for their manufacturers to compete with ours. Granting for a moment the possibility of such a speculative result, does any man in his senses, at this day, believe, whatever our Legislature might do with the corn-laws—whether they repealed them, or whether they retained them—that one single foreign country would allow its rising manufactures to be destroyed by British competition? No! the spendthrift principle which some of our manufacturers have adopted ever since the war, of exporting yarn instead of goods, has already decided this question. The exports of cotton yarn, which in 1818 amounted to 14,743,675*lbs.*, in 1838 amounted to 115,000,000*lbs.*! We have given foreign countries by these means, unwilling to lose a short-lived gain, every facility to undertake the weaving of their own fabrics, and now complain of their having become such apt scholars. If, indeed, such an universal monopoly of our manufactures could be established, and that permanently, without injury to our agriculture, it might be a consummation devoutly to be wished. But is any one sanguine enough to believe in its realization? Already, in 1827, in the United States, at the Convention of Harrisburg, complaint was made of a disposition on the part of "liberal England to smother their rising manufactures." Look at almost every country of Europe, none of them in so artificial or so heavily burthened a state as England, and see corn-laws almost universal.

Look at the United States, without a debt! and observe a corn-law, compared to their average prices of corn, as restrictive, if not more so than our own. Ask of what two men, now living, that country of republican institutions—where ancient aristocracies and their supposed selfish interests find no place—is justly the most proud! An American will at once point to the names of Daniel Webster and Henry Clay. Both of them equally, with every president downwards from General Washington to General Jackson, in favour of protection to domestic industry against foreign competition. You have read Mr. Webster's speech the other day on the Oregon and tariff questions; and you find that he mentions and defends the curious circumstance that from General Washington's administration to this time, the average of all their duties, reducing specific duties to *ad valorem*, would amount to an average *ad valorem* duty of more than 34 per cent.

These are not the opinions and the practice of what are called benighted farmers and selfish landlords. They are the opinions of the master-minds of the Anglo-Saxon race in a new world. Above all, observe the conclusions to which that most eloquent and enlightened writer of America, and that most self-devoted enemy to slavery, himself an advocate of freedom of trade, the late Dr. Channing, at last came; the extract is worthy of the deepest reflection:—"I would ask, what is to be the effect of bringing the labouring classes of Europe twice as near as they now are? Is there no danger of a competition that is to depress the labouring classes here? Can the workman here stand his ground against the half-famished, ignorant workmen of Europe; who will toil for any wages, and who never think of redeeming an hour for personal improvement? Is there no danger, that with increasing intercourse with Europe, we shall import the striking, fearful contrasts, which there divide one people into separate nations? Sooner than that our labouring class should become an European populace, a good man would almost wish that perpetual hurricanes, driving every ship from the ocean, should sever wholly the two hemispheres from each other. Heaven preserve us from the anticipated benefits of nearer connection with Europe, if with these must come the degradation which we see or read of among the squalid poor of her great cities, among the over-worked operatives of her manufactories, among her ignorant and half-brutalised peasants. Anything, everything, should be done to save us from the social evils which deform the old world, and to build up here an intelligent, right-minded, self-respecting population. If this end should require us to change our present modes of life, to narrow our foreign connections, to desist from the race of commercial and manufacturing competition with Europe—if it should require that our great cities should cease to grow, and that a large portion of our trading population should return to labour, these requisitions ought to be obeyed."

And yet our English people would be exposed to risks like these from a repeal of the corn laws, notwithstanding the pathetic appeals founded on the assertion that these laws starve the people, and that their repeal would fill them with an unstinted plenty of food—their com-

mon sense—a quality in which they are behind no class or station—convinces them of the fallacy of expecting a fall in the price of food coterminously with the maintenance of their present rate of wages. They know that as corn fell their wages would fall; and they shrewdly suspect that the chief object of those masters who wish for free trade, and for a reduction of the price of corn in this country, is, at the same time, to reduce their wages to a level with the wages of the continent. They have, in fact, advanced the logic of that school which would teach them that cheapness must be an unqualified good; for they have found that what is absolutely cheap may, sometimes, be relatively dear. Although wheat may be from 15s. to 30s. a quarter in Russia, Prussia, and Poland, they have not failed to ask the question—"What blessings attend this cheapness of wheat?" They have found that wages are so low, that rye, and not wheaten bread, is eaten by the working classes of those countries; and, with regard to wages, Mr. Gregg, of Manchester, one of the most intelligent of the manufacturers, and an advocate of free trade, is reported to have told them, in a comparison which (in the year 1839) he made between British and continental wages:—

Operatives are paid in—

France	5s. 8d.	per week of 72 hours.
Switzerland	4s. 5d.	82 ..
Austria	4s. 0d.	76 ..
Tyrol	3s. 9d.	88 ..
Saxony	3s. 6d.	72 ..
Bonn on the Rhine	2s. 6d.	84 ..

The average wages being a fraction under 4s. per week; the average wages paid to hands similarly employed in England, but for fewer hours, being 12s.

The working classes, therefore, have too vividly before their eyes the consequences of being reduced to a level with the continent, to look forward to the repeal of the corn laws as the anchor of their hopes, especially when they find, after minute examination, that, supposing even the price of the quarter loaf to be 10d., the landlords' share of it, from a 15s. a quarter corn law, will not amount to more than a farthing and 1-16th.

We have now seen that the most enlightened of the advocates of a repeal of the corn laws found their anticipations of its advantageous result on the faith of its establishing the universal monopoly of British manufactures. This monopoly our manufacturers enjoyed for many years, almost uninterrupted by foreign rivalry. They still enjoy this monopoly, as far as they are permitted to extend it. Under this monopoly it is, and coterminously with the existence of the corn laws, that their amazing riches have been amassed. Would they, at every risk to the rest of our home industry, and at every cost, attempt to compel foreign countries to permit them to preserve this their giant monopoly? Vain and futile expectation! All authority, and the commonest experience, alike forbid the possibility of its consummation. Montesquieu, indeed, informs us that a monopoly of this kind may, for a short time, be possessed by any one

country; but that, after a time, being set on an eminence—the object of the general gaze—other countries, from interest or envy, soon follow closely in its steps, and finally overtake it. These are the observations of profound wisdom; and instances of their truth are manifest to the eye of the most superficial reader. Whence the greatness of Tyre, Sidon, and Carthage? Monopoly! Whence that of Ancona, Venice, Genoa, or Amalfi? Monopoly! Short-lived, indeed; and each, in turn, to give way to a monopoly of greater power; but all, from a state of splendour and greatness, to sink to insignificance and contempt; unless, like Tuscany, Holland, Flanders, and England, its great accumulation of wealth was secured to it by its solid investment in land—the only lasting basis of national greatness.

To hasten to my conclusion, then—Why would I maintain a system of corn-laws? Among other reasons, I answer—that by them I believe, with the help of occasional foreign importation, the whole people are more uniformly supplied with good food than they would be by the freest trade; that by them neither the manufacturing operatives, or any other workmen, are injured; because their wages would be lowered with a fall in the price of corn; that if the corn-laws were repealed, the labourers thrown out of employment in agriculture would, by competition with the operatives, drive down still lower the rate of their wages; that our manufacturing greatness grew up under the corn-laws; and that the repeal of them would establish the lasting monopoly of the British manufacturer over the whole world, is an utterly fallacious expectation; whilst this attempt to establish such a monopoly would not only meet with a signal repulse from foreign powers, but would be made at the imminent risk of the agricultural and the remaining interests of this country, which are not manufacturing. I fear the result, in one generation, of a second great prostration of industry, from a fall in prices; that might be followed by a revolution, which, even in England, might not again prove a peaceful one. It is for that great remainder of my countrymen, which is not manufacturing, that my principal alarm is entertained. The country towns with their retail trade—the country villages with their artisans—the farms with their labourers, form the great majority of the people of this country. The number of those, more or less interested in the growth of British corn, cannot be estimated at less than three-fourths of the entire population. The manufactures of cotton, woollen, linen, and hardwares, do not constitute the greatest trades of this great country. **THE TRADE OF GROWING CORN IS ITS GREATEST TRADE.** The capital, in this great trade of growing corn, of the tenants alone, is estimated at more than that engaged in the four manufactures put together to which I have just referred. When we add to this not less, perhaps, than fifteen hundred millions sterling, embarked in the land by its owners, and all the capital invested in the retail trade of the agricultural towns dependent on the well-being of the British cultivator, we may see at a glance the terrible consequence that might ensue from even the smallest mistake in dealing with such mighty interests. We might anticipate the conse-

quences more clearly, perhaps, if, instead of the 15,000,000 of people connected with the land, we were to place before our eyes, in idea, the possibility of 15,000,000 being engaged in the cotton manufacture (although half-a-dozen worlds could scarcely employ so many), and their being suddenly exposed to a competition with foreigners to whom they were inferior in the art of producing cotton, or through the pressure of taxes and liabilities, might be considered as practically, although not absolutely inferior; imagine for a moment the contingency of these 15,000,000 cotton manufacturers, through an opening of the ports, being suddenly deprived of employment, or reduced to half employment, or to a quarter, and to a quarter profits of their trade! Would any man—even a modern economist, bemused with abstract theories—have the complacency, or rather the gladiatorial daring, to persist in his beloved system (however true according to first principles) in the face of a contingency like this? It is from so dread a contingency that, through the medium of the ancient system of protection and of the corn-laws, I seek to protect the greatest trade of the country—that which produces its main supply of food; and by the same means, to secure the great majority of the people, which that great trade of growing corn maintains, in a state of permanent employment and comfort. And he is a bold minister who on the rocks of theory or clamour will venture to run the risk of allowing such mighty interests to split.

And yet, since this letter was commenced, the rumour has become stronger and stronger that this violent risk is to be undergone. What! by the Government of Sir Robert Peel? Impossible! when we call to mind the circumstances under which he expelled you from power, and himself assumed the reins of government! Is it because you threatened a comparatively moderate blow at the system of protection, and to him, in consequence (who then upheld that system), you were compelled to forfeit the seals of office, that he can venture now to propose to Parliament, *as minister*, the entire abolition of that protection? Impossible! again, and again, impossible!—unless even the small vestige of faith in public men, to which the people still fearfully cling with indeed almost incredulous hope, is at once, and for ever, to disappear from the earth. Sir Robert Peel, when he proposed the present corn-law, must have foreseen that scarcity might ensue; the very virtue of his graduated scale was to consist in meeting the necessities of every turn of fortune—a large or a deficient supply. He may have seen reason to doubt, as some of the supporters of the corn-law have done, the policy of those jumps in his scale, which lead to too much speculation on the part of the merchant. He may think, as I am inclined to do, that a uniform graduation of the scale of 1s. from 50s. to 65s. (which would leave the duty 10s. at 60s., and 5s. at 65s. a quarter—descending no lower than the latter duty), might better answer the wants both of the consumer and the grower than the present scale. But, from a jumping scale, to leap at once to the entire demolition of a system of protection, of 400 years standing, is a spring of such stretch and elasticity, as to be worthy

rather of the arena of the gymnasium, than of the school of prudent and sagacious statesmen. This busy and ill-favoured rumour I will not therefore believe, because I cannot believe it. Neither in ancient history nor in modern experience can I discover any example of a transition of such an extent, under such circumstances; therefore, I repeat, it is a belief that I can neither compass nor imagine.

The minister might, indeed, have seen cause to doubt, in his own mind, the expediency of a corn-law. He might, as an individual, abstain from voting; or, as an individual, he might even publicly recant his opinion, and vote with you for a repeal of the corn-laws. But to use his influence *as a minister*, to repeal laws which he was constituted minister purposely to uphold, is, to my mind, an irreconcilable impossibility. If the corn-laws were repealed by any government, they must be repealed by one of which you are the first, or a principal member. But I could not envy even you the office of uprooting this starchy oak of centuries of British growth—of loosing from its sacred fastenings this anchor of a people's established trust—a trust so deeply fixed that, as I think, all the energetic and almost unopposed efforts of a most active and not very scrupulous party, have been unable seriously to shake it. The middle classes of the borough and market towns may have their leaning to this corn-law or that; but, as a body, they are not, I am bold to say, in favour of that unrestricted freedom of competition with foreign countries which a repeal of the corn-laws, as its first consequence, necessarily involves. And I add to this assertion another equally strong—that had there been, or were there now, a minister, whose language in upholding these laws was evidently based on conviction—a minister who showed a determination, so long as the representatives of the people supported him, to support the old system of protection—the corn-laws would still run on for many a long year, for the security and welfare of the people.

We will suppose, however, for one moment, your return to power; a day, indeed, which I should rejoice to see, but one to which, all things considered, I should look forward as encanopied by no unclouded sky. You would, if not prevented by a strong mercantile and agricultural opposition, proceed to repeal

the corn laws. I am not sure you would have the power; but granting you had, you must, as certainly as the present minister cannot repeal the corn laws forthwith repeal the income tax also. In addition to this, what import duties could you then maintain? How many would the mercantile and agricultural opposition arrayed against you allow you to maintain? Literally none. Where would be your revenue? Where would be your means to uphold the public credit? Whence could arise your power to continue the payment of the National Debt? These are reflections which will, of course, have occurred to you. Your fertility in resource may enable you to overcome difficulties of this kind. My infirm nerves, I confess, would shrink from the encounter. You would, at least, possess my best wishes, should you be put to the trial. It may be presumptuous in me, however, even to doubt your ability to ride upon such a storm; for, as I said at first, my speculations or my fears can lay no claim to infallibility.

But, come what may, we are in all-wise and all-merciful hands, which surround and maintain us; and I will not despair; and should my dismal forebodings prove to have no foundation in the result—should the measure you advocate prove, as you expect, a comfort and relief to my countrymen—at any sacrifice to private interests of my own, if they will be at all affected by the change in question—nay, even if a still heavier sacrifice were demanded of me on the altar of the public good, I trust I could gratefully welcome the hour of increased happiness, from whatever source, to a country I love; and humbly invoke the blessing of Heaven on the man who was the instrument of so transcendent a boon. For, that “the welfare of the people is the supreme law” I can scarcely be ignorant, when I am favoured with the friendship of one whose patriotism is of that high order, that his private virtues, without any change in their character, have but to expand with the occasion into enlarged public affections. That honoured individual, I need scarcely add, is no other than yourself.

With many apologies for this too long intrusion, and with every sentiment of respect, believe me to remain, my dear Lord John, ever truly yours,

Wydale, Dec. 6.

E. S. CAYLEY.

“TENANT-RIGHT.”

IMPORTANT MEETING AT THE FARMERS' CLUB-HOUSE.

On Wednesday, Dec. 10, a special general meeting of the members of the Farmers' Club was held in their rooms at the York Hotel, Bridge-street, Blackfriars, for the purpose of taking into consideration the subject of “tenant-right” of tenant-farmers. Mr. Baker, of Writtle, Essex, occupied the chair. The discussion of this subject had been postponed from the indisposition

of Mr. Shaw, who had undertaken to open the question, and this evening having been specially fixed as an extra meeting for the purpose, the attendance of members was unusually large—the largest, in fact, which has as yet taken place since the formation of the club. Among those present we observed George Emery, Esq., of Banwell, Somers-

set; Cuthbert W. Johnson, Esq.; Jonas Webb, Esq., Babraham; T. Chapman, Esq., Stoneleigh; Daniel Trinder, Esq., Cirencester; George Boddington, Esq., Sutton Coldfield; John Barnard, Esq., Canfield Hall; William Fisher Hobbs, Esq., Marks Hall, Essex; W. R. Browne, Esq., Chiseldon; Henry Cheffins, Esq., Little Easton; William Cheffins, Esq., Islington; Richard Gates Esq., Bramley, near Guildford; Charles Page, Esq., Southminster; George Kilby, Esq., Leicestershire; John Kemp, Esq., Southminster; T. W. Burness, Esq., Chelmsford; Jeremiah Birdits, Esq., Bretford, Coventry; Robert Page, Esq., Bradwell, Essex; J. F. Kemp, jun., Southminster; James Thomas, Esq., Lidlington Park; Jas. Grove, Esq. Great Baddow; Robert Baker, Esq., Writtle; John Browne, Esq., Chiselden, Wilts; Kersey Cooper, Esq., Euston, Suffolk; John Beck, Esq., Congham, Castle Rasin, Norfolk; George Turner, Esq., Barton, Exeter; Robert Smith, Esq., Burley Park, Oakham; J. A. Ransome, Esq., Ipswich; Thomas Pope, Esq., Kidbrook; W. Bell, Esq., Bucklersbury; W. Hutley, Powers Hall, Witham; C. Pocock, Latham, Berks; W. Bennett, Lewsey, Beds; S. Bennett, Bickneys Park, Beds, &c.

The CHAIRMAN, in opening the business of the evening, stated that the question they had this evening assembled to discuss was that of the rights of tenant-farmers; and it was, as most of them well knew, to be opened by Mr. Shaw (*cheers*). That gentleman would take precedence on the present occasion, and he [Mr. Baker] was quite satisfied, from the abilities and intelligence of that gentleman, and the great amount of information he had acquired upon the subject, that he would give rise to an instructive and satisfactory discussion (*Hear, hear*). He begged leave to call upon Mr. Shaw.

Mr. SHAW immediately rose amid the cheers of the meeting, and said—Knowing as he did that when the members of this club met they were sure of having associated men of practical knowledge and experience, who were so much better able to form a just opinion upon the subject which they were about to enter upon than him, he could assure them that if any one else had made an overture to bring it forward, he should not have done so (*Hear, hear*). But believing the question to be one of vital importance, whether to the landlord, the tenant, or the labourer, he was unwilling that an opportunity should not be offered for its discussion (*cheers*), and therefore he now appeared before them for the purpose of mainly raising a discussion, leaving the main and material parts of it—which were the practical ones—to be discussed by those who possessed an amount of experience and such habits of business as would enable them to arrive at a sound conclusion (*Hear, hear*).

Mr. SHAW then proceeded as follows:—“On all occasions where the subject of ‘tenant-right’ has been discussed, as it has been by several local farmers’ clubs and societies, the practical details have occupied the greater part of the discussion. I am fully sensible of the advantages of well-regulated details as regards ‘tenant-right’; but on this occasion I am anxious to see the principle affirmed by this club, leaving the mode of

carrying out, or details incidental to this discussion, to be made the subject of future consideration. Not having met with a precise definition of ‘tenant-right,’ I have experienced much difficulty in wording it; and I must confess I have not been able to do so to my own satisfaction. Mr. Sharman Crawford, who has for upwards of 10 years agitated this question, in reference to the tenantry of Ireland, and has twice introduced bills into the House of Commons on the subject, thus defines ‘tenant-right’ :—‘It is the interest the tenant should have in the capital he has expended in money and labour, in building houses, and making permanent improvements.’ It must be borne in mind, however, that although the principle is very much the same, still the actual situation of the Irish and English tenant is essentially different, the outlay of the former upon permanent improvements, such as buildings, &c., being much more general than is performed by the English tenant. I should define ‘tenant-right’ to be ‘the right of the tenant to require compensation legally for outlay in the improvement of the soil or buildings when the period of his occupation has not been of sufficient duration to enable him to reimburse that outlay.’ I need scarcely remark that the proportion of the outlay which should be reimbursed, is that which remains after making due allowance for the benefit he has derived. In entering into this question, I must premise that I consider ‘tenant-right’ as a question purely between landlord and tenant, and wholly distinct from the rights between incoming and outgoing tenants, commonly called ‘tenants’-rights’ or ‘dues.’ The payments made by the incoming to the outgoing tenant vary according to custom, and although embracing certain other items, are little more than payments for labour, frequently used as a means of drawing heavily upon the purse of the incomer, absorbing his capital, crippling his means, and preventing him from managing his farm to advantage. Upon this subject Messrs. Kennedy and Grainger, in their work on ‘The Customs of Tenantry,’ thus express themselves :—‘There is nothing more deserving of remark than the superior advantages enjoyed by tenants entering upon farms in Scotland, and some parts of the north of England, over those in a similar situation in the south, or in some of the mid-land districts. In the former he has nothing to pay for on taking possession, but is enabled to lay out his capital to the best advantage in stocking his farm, and afterwards conducting it upon an improved system; whilst in the latter he is, in the first instance, frequently crippled as to pecuniary resources, by being obliged to pay a heavy valuation on entering, and does not in consequence, afterwards possess the means of making those improvements from which he might derive the greatest advantage. Thus in the former a farm may be stocked, and conducted more profitably to the occupier, with little more than half the money that is required in the latter. In many counties in England a farmer entering upon 200 acres of land, with a capital of 1500*l.*, has to pay according to the custom of the place, 1200*l.* upon a valuation for stock, leaving him only 300*l.* to carry on the business; whilst in the north, and in Scotland, a farmer may enter upon the same quantity of land,

having no valuation to pay, with only 800*l.*, and after stocking his farm to the best advantage, have the same sum left that the other has, but with much better opportunities of employing it profitably. It is these advantages enjoyed by a tenant, combined with his having an interest in the soil for a certain number of years, and the superior management of the land, that render estates in Scotland so much more valuable than in England, the rents in the former being nearly double what they are in the latter. It is true, that in Scotland the tenants pay no taxes or rates; but after deducting for this, and considering the measure, the rents would then be higher by 5*s.* an acre than they are in England; and under the Scotch system, a farmer would derive a greater advantage from paying an additional 5*s.* per acre, than he could by entering upon a farm subject to a valuation, even at a reduction of 5*s.* per acre; thus making a difference per acre of no less than 10*s.* Seeing that this custom prevails, with more or less intensity, in every county in England, it should unite the tenantry to co-operation in demanding the general adoption of a 'tenant-right,' whereby this one of many evils would be removed. I am well aware that if landlords were required to pay their out-going tenants for their so-called 'tenants'-rights,' it would draw heavily upon their resources; but once bought up they would not recur, and they would derive a permanent advantage. I am, however, convinced that it is as essential for their mutual benefit that a landlord should be possessed of sufficient capital to meet the requirements of his estate, as it is for a tenant to be possessed of sufficient capital for the cultivation and good management of his farm. I am confirmed in my opinion of the advantages which landlords would derive from buying up their customary 'tenants'-rights, or tenants'-dues,' as they are sometimes called by Mr. Layton Cooke, in his work on the valuation of estates, in which he thus states the question. 'The following statement shows the effect produced by the extraordinary charges alluded to, and, to a certain extent, accounts for the difference in the value of land of similar quality in districts where these valuations prevail, compared with those in which they are unknown:—

The rent of a farm of 200 acres unfettered by valuations, at 30 <i>s.</i> per acre, is.....	£300
If the extraordinary charges average 3 <i>l.</i> per acre, the sum to be paid by the incoming tenant is 600 <i>l.</i> , and the deduction of 10 per cent thereon is.....	60

Which reduces the rent, subject to valuations, to.. £240

Being a reduction of 40 per cent. on the value of the estate, and in cases where the valuation of tenants' dues, upon a similar description of land, exceeds 3*l.* per acre, or where the land is of a still lower quality, it occasions a fearful diminution, involving, possibly, an amount equal to a moiety of the value of the property. Tenants who have paid for these items on entry are entitled to be reimbursed on quitting: but a landowner could not appropriate his surplus capital to a better purpose than to paying the amount of those inventories, and re-letting his estate free from all such

incumbrances, at proportionally improved rents." The question of "tenant right," according to the definition I have attempted to give of it, divides itself into two heads. First, "as regards outlay in the 'improvement of the soil,' whether permanent or otherwise;" and, secondly, "as regards outlay on the improvement of buildings." The first of these heads, "improvement of the soil," may be again subdivided into two parts. First, permanent improvements, or such as will endure through a long period; as enclosing and breaking up waste land, uprooting trees and hedge-rows, and levelling banks when the enclosures are small, draining, making roads, &c. Secondly, improvement of the soil by extra tilling, subsoiling, and the application of an additional quantity of manures. Now, as regards the first class of improvements, it is manifest that a considerable period of time is requisite to enable the tenant to recover back so large an outlay. I am anxious to establish the right of the tenant to compensation under any tenure, the duration of which has not been originally agreed upon, and hence any reference to leases will only be made for the purpose of exemplifying the subject. A lease for this purpose may be considered as a mode of payment by the landlord to the tenant for improvements, by securing to him the enjoyment of his outlay during a sufficient period to enable him to reimburse himself. Upon some estates, the best and most equitably regulated (as, for instance, those of the Earl of Yarborough, in Lincolnshire) no leases are granted, but an agreement is entered into between the landlord and the tenant, whereby, in the event of an unwilling removal of the tenant, compensation for permanent improvement is made. But to carry out my views to the full extent, the tenant should obtain compensation for actual improvements, under whatever circumstances he might quit his occupation. Leases and agreements, such as I have just alluded to, cannot be otherwise regarded than as affirming the principle of "tenant right;" for if it be just that the tenant should have time to reimburse his outlay, he has an equal claim in the event of his being deprived of his occupancy by unforeseen circumstances, and which of course is more likely to occur where he has no fixed tenure. Assuming that the view I have taken of a lease, in its application to this question, be correct, it may be desirable to cite a valuable and living authority upon the question. Professor Low, in the last edition of his work on agriculture, thus speaks of the benefit of leases:—"All experience shows that the means of perfecting the agriculture of the British islands, as a branch of public industry, depends essentially upon the relationship which we shall be able to establish between the landowner and the farmer. Not even the accumulation of capital to the degree of stocking the farms of the country will avail for giving to agriculture the means of successful cultivation and improvement. The owner of this capital must have the means of employing it with advantage, by security of possession, by the privileges required for the proper management of his business, and by that fair and lenient exaction upon his industry which will enable him to enjoy his capital with a profit. If these

conditions are withheld, the capital invested in the cultivation of land is subjected to drawbacks in the application of it to its necessary uses, which lessen the returns which it is fitted to yield, and the means of improving the national territory to the degree which the case admits of. While if, along with the power of acquiring capital, are afforded the means of applying it to its purposes with effect, the improvement of the country and of the state of its agriculture will follow as a consequence. Wherever these necessary conditions are supplied agriculture improves, intelligence extends amongst the great body of the farmers, and one generation excels the preceding one in the knowledge acquired and the means of employing it for private advantage and the general good. Wherever, accordingly, in any part of the British islands just relations, or relations approaching to just, have been established between the landlord and the tenant, the effects are observable in a more advanced condition of agriculture, and the existence of a more prosperous tenantry. In the finest parts of England funds have been progressively accumulated for stocking the farm to a degree unknown in any other country in Europe; but the essential conditions having been too often wanting of security of possession, and a beneficial connection between the landlord and the tenants, agriculture has remained comparatively fixed, while every other branch of industry has been advancing, and the great mass of the farmers have continued prejudiced and ill-informed, from father to son, unable or unwilling to profit by the natural advantages of their situation. Whereas, in a few parts of the country, where together with security of possession has been accorded something like a system of just and beneficial tenures, the farmers have been enabled to establish and pursue a system of agriculture which has become the model for other parts of the country far more favourably situated with respect to natural advantages." No sound reason can be adduced to show that the tenant farmer should be called upon to place his property in a state of jeopardy which is not required of the tenant of any other description of property; nor can the difference of the position of the occupant of the land and the occupants of other property be accounted for, unless, indeed, it be traceable to the origin of tenancy in this country, when the tenant was considered as little better than the bailiff of the lord of the soil. The landlord who should expect the manufacturer or the commercial man to make an outlay in the permanent improvement of his premises, without such an agreement as would secure him compensation, should he be ousted before he was enabled to obtain a return, would be regarded as little less than a madman. The practice of other classes, therefore, warrants the compensation contended for. In respect to compensation for this class of improvements, a considerable advance has been made; and there can be no doubt but that, as the owner of the soil shall become better advised of the advantages to himself from adopting such a system, the progress will be more rapid. As regards the second part of this head—namely, improvement of the soil by extraordinary cultivation and the ap-

plication of extra manure, it is but common justice and common honesty that the tenant who expends his capital should either have the opportunity of reaping the advantage by taking a sufficient number of crops, or receive compensation for that which he leaves in the soil for the benefit of his landlord—I say for the benefit of his landlord, because if the farm falls into his hands it will let for more money. In taking this view, I do not seek to obtain any peculiar advantage for the tenant, but merely to obtain for him a return for skill and capital invested, and for which I think it will not be denied he has a just claim. As regards the second head—the improvement of buildings—the propriety of making compensation for this species of outlay by the tenant cannot be doubted. Upon the suitability and convenience of farm buildings, in a very considerable degree, depends the advantage of the tenant from his occupation; and yet in what a lamentably deficient state, both as regards structure and extent, will most farmsteads be found! A dogged adherence to old maxims of law, in every point having regard to the management of their estates, whether in reference to the rules of cultivation, or the economy of the buildings, has especially signalled the lords of the soil. Privileges have been conceded to occupiers engaged in trade, by which they are permitted to remove buildings erected for the express purposes of trade, whilst the landlords, themselves the legislators, have not sought a similar privilege for their tenantry; nay, with more of law than justice, have frequently insisted upon buildings erected at the cost of the tenant being left for their use and benefit without the slightest compensation. Surely in farming, as in trade, if the tenant chooses to incur the expense of erecting buildings for his own accommodation, when the landlord is unwilling to lay out his money, he should at least be permitted to remove such buildings on his quitting the farm. As regards compulsory compensation for buildings erected by the tenant, I am aware that considerable difficulty must occur, inasmuch as without a perfect understanding between landlord and tenant, the landlord might be involved in heavy, inconvenient, and not unfrequently unnecessary expense; this remark, however, would not apply if the power of removal were granted to the tenant. It will be readily admitted that but a small proportion of the land of this kingdom is let under lease, or under agreement, giving compensation to the tenant in the event of unexpected removal. Now, I am willing to give credit to the fullest extent to those noblemen and gentlemen, owners of estates, who, not giving any fixed tenure to their tenants, may be implicitly relied upon as never turning out or taking undue advantage of a well conducted tenant; but then it must be borne in mind that honour, any more than talent, is not hereditary, and hence the estate of the most noble-minded, honourable landlord may be destined to undergo great changes when least expected. I do not believe that, including leases and agreements giving compensation, one-third of the tenantry enjoy this protection in the investment of their capital. According to Macqueen, the capital of the tenantry in the United

Kingdom is estimated at 2,971,756,670*l.* If, then, the opinion passed above is correct, two-thirds of the tenantry, employing a capital of 1,981,037,780*l.*, engaged in an occupation in which a number of years, according to the system of cropping adopted, is absolutely necessary to enable them to obtain a return in the ordinary mode of cultivation, have their property in jeopardy. What man of common prudence will in such a state of things embark his capital in improvement of the soil? On the other hand, how liberally and spiritedly would extra cultivation be carried on, and extra manure applied, if the tenant felt safe in obtaining compensation provided he were suddenly and unexpectedly deprived of his farm! If the position of the landlord be referred to, it will be found that he will be no less benefited by the establishment of a "tenant right." The confidence inspired in the tenant from the knowledge that his capital is safe will stimulate him to improve the soil, and of this improvement the landlord must sooner or later obtain a proportionate part. As the old system of farming is passing away, so must old customs, antiquated modes of tenure, and "clogging" covenants. "High," or what may be termed a more "artificial" mode of farming, must be pursued by the tenantry, and the landlords must keep pace with the tenants. They ought, indeed, to take the lead, and I am convinced that they could not do so more beneficially to their own interest than by establishing a "tenant right." The cultivation of the soil cannot henceforth be carried on to advantage without ample capital—tenants with ample capital are becoming too much men of business to invest their capital unless they see it secured. Landlords will find it to their advantage to have tenants possessing capital; and hence I doubt not the time is at hand when a knowledge of their own interest will induce them to concede the establishment of what I contend for, a "tenant right." There is one other important point which it seems to me would be attained by securing compensation to the tenant—the system of scourging the land on the approach of the expiration of a term would be avoided, inasmuch as the tenant would be entitled to compensation for any outlay beyond that which might be termed ordinary good cultivation of the land he occupied. I am well aware of the difficulties which are involved in any attempt to establish a "tenant right" by legal enactment, an idea prevailing that the question is one of contract between landlord and tenant. Mr. Sharman Crawford has twice in the last ten years brought bills into the House of Commons with a view to the establishment of a "tenant right" in Ireland, but was obliged to withdraw his bill on both occasions. On the last occasion, however, Sir Robert Peel expressed himself favourably, and promised that the government would take the subject into their consideration. Since that time the Irish commission on the state of landlord and tenant has made a report, and presses the necessity of the adoption of some measure on the subject. Lord Portman has twice introduced bills into the House of Lords for the establishment of a "tenant right" in England; but as yet sound principles have not made sufficient way to ensure its success. I look, however,

to the tenant farmers themselves to work out this measure of good for themselves and their landlords, and I trust that the opinion of the London Farmers' Club in favour of "tenant right" will be put upon record this evening, and that the example will be followed by all the local farmers' clubs; and if such be the case, so highly do I estimate their collective influence, that I shall have a confidence in the speedy adoption by the landlords of a system eminently calculated more than any other to improve the condition of the tenant, confer a benefit on the landlord, afford an increase of employment to the labourer, and add vastly to the aggregate amount of our native produce, and consequently to our national wealth. Having thus raised the question, I will leave the discussion of it in your hands, with this observation, that I regret the subject has not met with earlier consideration by this club (*cheers*). I stated in the outset of my remarks that I thought all that was needful on my part was to raise the discussion, inasmuch as you were better able to grapple with the details, and suggest the mode of carrying out your views. I now leave it in your hands, only regretting that some one had not undertaken the task who would have set the subject before you with more clearness than I have done (*loud cheers*.)

The CHAIRMAN said, he should have some observations to address to them by-and-by; but he should be glad in the meantime to hear the remarks of any gentleman present, who might be desirous of speaking upon this important subject.

Mr. BROWNE said he wished to observe, that what tenants' rights were was at present altogether undefined, inasmuch as the customs of different parts of England were so variable, that it was difficult to say what were tenants' rights. It would be very desirable if a code of regulations could be adopted, by which tenants' rights all over the country might be assimilated (*Hear, hear*). He hoped, however, that tenants had become so intelligent, that henceforth they would protect themselves by the contracts that they might make with their landlords (*Hear*). The tenants who had no leases had no remedy of that sort, but in every country there were customs which regulated matters between tenants-at-will and their landlords. In his county (Wilts) tenants-at-will were less protected by custom than they were elsewhere. In Kent the tenants-at-will were entitled on leaving their farms to "half dressings," and even to "quarter dressings." The outgoing tenant always received compensation for any improvements he had effected. In Wilts there was no such custom. This was a great hindrance to improvement. If, at the expiration of his lease, it was found that the tenant exceeded what was called the custom of the country, he received no compensation, and therefore it was most desirable that some code of regulations should be adopted that might be applicable to the country at large. Whether that could be effected by Parliament was a matter on which he was rather sceptical. He thought Parliament would have great difficulty in attempting any interference between landlord and tenant. Lord Portman and others who had attempted it had experienced this difficulty (*Hear, hear*). He hoped, however, as matters became better

understood, it might be eventually overcome. He quite agreed with Mr. Shaw, in thinking that it would be very desirable that some such general code of regulations should be adopted (*Hear, hear*).

Mr. CHARLES STOKES next rose. He was not a member of the club, but was allowed to speak on the question being put to a show of hands. He said he should not have presumed to appear before them to-night, if he had not taken part in a discussion on the same subject in his own neighbourhood (*Hear, hear*). He would first allude to leases, and before he did that he begged to state that he quite agreed with the principle laid down by Mr. Shaw, that all unexhausted capital which the outgoing tenant leaves for the succeeding tenant or the landlord ought to be paid for (*Hear, hear*). In all poor soils, in particular, inducements should be held out for the employment of skill and capital in improving them. Of this, Mr. Coke, of Norfolk—the late Lord Leicester, he meant—had set a worthy example (*Hear, hear*). If the tenant knew that at the expiration of his lease he should get no compensation, he would not leave any of his capital in the land if he could help it (*Hear, and a laugh*). If there was no renewal of lease, or an admission of the principle of tenant's rights, the tenant did not leave the land in the condition in which it would be left otherwise (*Hear*). In Lincolnshire, good and liberal rights were allowed to the tenant, and the consequence was that the land was in fine condition (*Hear*). He was quite satisfied that the adoption of such a principle throughout the country would do more for the introduction of good farming than anything else (*cheers*). It would promote the interests of the tenant and the interests of the landlord also; it would give the former security for his capital, and it would give the agent of the latter the opportunity of telling the tenant that he must farm his land well, or have notice to quit (*Hear, hear*). But with regard to permanent improvements: there was no doubt that when there was no lease the landlord ought to do all the permanent improvements (*Hear, hear*); and the tenant ought to be secured for his actual outlay. He could not say more than this if he talked for half an hour (*cheers*). He observed, in the last volume of the *Agricultural Journal*, an improved form of agreement between landlord and tenant, which was very well as far as it was applicable. But it was quite impossible to frame any form which would apply indiscriminately to all parts of the country (*Hear, hear*).

Mr. BODINGTON said he could not but feel that the subject before them was one of considerable difficulty to discuss, and he inferred that this was felt generally, from the backwardness which he perceived on the part of gentlemen present, of great experience, in approaching this question, which they did not manifest in others (*Hear, hear*). Now it struck him that tenants had scarcely any rights at all (*Hear*); at least he, as a tenant, did not know what rights he had (*"Hear," and a laugh*). If he wanted new buildings, he could not compel his landlord to put them up; and he did not see in what way they were to get tenants' rights unless they made them matter of covenant when they

took the land (*Hear, hear*). Otherwise the tenant had no rights; he was at the mercy of the landlord. The question he thought divided itself into two parts: one was how far their rights were affected by acts of Parliament, and the other how far they rested between landlord and tenant. He had not a great deal to say upon the subject; but there was one point which he should not like to pass over without alluding to. The point to which he referred was the effect of the game laws upon the tenant farmer (*Hear*). It had always struck him as a great injustice, that the tenant farmer, who reared all the game, should be called upon to pay a heavy tax before he could be allowed to shoot a single head. He thought it unjust in the Government to call on the tenant-farmer to pay 4l. or 5l. for permission to kill the game he rears on his own farm. If farmers thought proper to apply for rights to the Legislature at all, they should ask leave to kill the game they reared on their farms, and sell it wherever they can find a purchaser. Poachers could take the game by night off a man's farm, and if he once got it into a lane he might take it to the market for sale without any impediment; but the man who reared the game could not touch it without paying a heavy fine (*Hear, hear*).

Mr. BENNETT next rose to address the meeting, but prefaced his speech by saying that he was not a member of the club, and the question was again raised as to the propriety of allowing non-members to take part in the discussions.

The CHAIRMAN said that it was one of their rules that although any member might introduce a friend not being a member, the latter should not be allowed to take part in discussions; but when he saw such men as Mr. Bennett among them, he could not help saying that he should be happy to hear his observations, trusting that the benefit which they should mutually derive would induce that gentleman and others, who were not at present members, to join the club (*cheers and laughter*).

The question was then put to the vote, and it having been decided that he should be heard,

Mr. BENNETT proceeded. He said he regretted that he had not entered the room in time to hear Mr. Shaw's opening of this question, as the subject was one upon which he had thought a great deal for a considerable length of time, and he had to the utmost of his ability with his own pen endeavoured to advocate the cause of the farmers in this respect (*Hear, hear*). It was, therefore, with much pleasure that he had heard that the question was to be taken up to-night by so influential and highly respectable a body as the Farmers' Club of London. He thought the best mode of proceeding in the outset was to show what difficulties stood in the way of obtaining their just rights (*Hear, hear*), where they were most vulnerable, and where lay the greatest difficulties of obtaining Parliamentary redress. The man who had improved the soil by his industry and skill had often been reduced to the alternative of enduring the frowns and scowls of his landlord, or to leave his farm without receiving any compensation whatever for the im-

provements made upon it. If a man who has obtained all the manure within his reach, drained all his heavy land, and marled all his light land, yet if he or his son happen to stumble over an old hare, he will have immediate notice to quit, and leave all those improvements behind him. That was a state of things which, all would admit, ought not to exist. If a tenant gave at an election an adverse vote, he would risk thereby the well-being of his family and all the improvements he had made on the land. Some important change was therefore requisite, but the difficulty of accomplishing it was the question. He thought the Legislature ought to interfere for the protection of the tenant. At present the tenant might put down a pump, plant a beautiful and thriving orchard, or add a number of buildings to his homestead, at his own expense; but if he attempted to remove any of these, he would be regarded in the eye of the law as affecting the fee-simple of the land and the rights of the landlord. The law which would punish him for dilapidation would not give him that protection to which he was entitled in the enjoyment of those improvements. (*Cheers.*) It was absolutely necessary that some change in this respect should take place, and especially at a time when persons who knew nothing of agriculture took on them to tell the public, through the medium of the press, that the land was not half farmed, that the manure was allowed to run down the fields and nourish reeds and rushes, and a thousand other things. Any one travelling in a stage coach or railway carriage, must have heard such persons saying, "You farmers ask for protection, instead of adopting an improved system of farming on your lands." It ought, therefore, to be known that those improvements were not going on in the way the country required, because the farmers had not proper security for the outlay of their capital on agriculture. (*Cheers.*) It was his opinion that there should be some legislative enactment on a broad principle, giving the tenant certain rights with regard to unexhausted improvements in the soil. Then came the inconvenience of arbitration at the expiration of every term of agreement—an inconvenience to which landlords would not be inclined to subject themselves. And landlords who had only a life interest in this property, however much disposed they might be to assist the tenant, could not be reasonably expected to encumber themselves by allowing the tenant to improve to the extent of his wishes. These were some of the difficulties of the case. He had no doubt that every tenant should get compensation, but the question was as to how far the landlord should control the tenant in the application of his capital. He (Mr. Bennett) thought the tenant ought to be allowed four years' notice at least, in order to enable him to extract from the soil the capital he had expended. Some noblemen, among whom was the Duke of Bedford, had secured their tenants in expending their capital in every kind of agricultural improvement; others had let their lands at a corn rent, which was the most just and honest principle on which land could be held. He thought there ought to be some decided enactment to regulate this matter, for without that, any little arrangement that might be made in some districts, would not be productive of the desired effect. (*Cheers.*)

Mr. THOMAS POPE said, as a young member of that club, and a young farmer, he had come there that night in order to endeavour to ascertain what every farmer ought to know—namely, what were his rights (*hear, hear*). He quite agreed with the generality of the observations which he had heard, but conceived that many of the disadvantages of which the farmers had to complain had arisen from their own fault in not taking proper care of their own interests when they took their farms (*hear*). About two years since he negotiated for a farm under the Earl St. Germain's; he had to negotiate with a solicitor, and felt that there were disadvantages which he could not get over with regard to several clauses inserted in the original lease. He took it, however, and met the person who represented his lordship, who was a practical man, and knew what clauses ought to be inserted and what ought not. The farm was in a bad state, and he (Mr. Pope) represented that, without a good deal of capital, nothing could be done with it, and that he must have it on a twenty-one years' lease terminable at fourteen. This was agreed to, and allowed him to go on spiritedly. The farm buildings also were in a very bad state. Of course it could not be expected that he (Mr. Pope) should repair them; his lordship, in fact, did it. Now, the consequence of all this was, that he felt that he had plenty of time to regain what he had put into the soil (*hear*). Doubtless there must at all times be a suitable arrangement between landlord and tenant. It must be so in every case, with the farmer as in the mercantile world, where, unless you could show mutual advantage, you could get no contract (*hear, hear*). In Blackheath the Earl St. Germain's granted leases in almost every part of the estate. The Duke of Bedford and Earl St. Germain's both did it; and if examples like these were held up for imitation, they would be followed by other landlords. If this club and other similar clubs came to resolutions that the rights of tenant farmers must be protected, the landlords must give those rights, or farm their land for themselves (*hear*).

Mr. SAMUEL BENNETT remarked that the life estates referred to by his brother could not be taken to mean hereditary estates, for if a man were benefiting an estate for his son he was benefiting it for himself. It was only those estates that went out of the family at the expiration of the life that should be regarded as an exception to the general rule. Mr. Pope thought it was the tenant's own fault if he did not make a good bargain, but it was easier to talk about making good bargains than to make them. There were sure to be twenty or thirty applicants for every good farm that was to be let. The land agent would lay down his terms, and say—"If you do not accept the land on these conditions, another person will." The question with the tenant was not whether he would make such a bargain, but whether he would make that bargain or none at all. A legal enactment was then necessary for the protection of the man who, in order to provide sustenance for his family, was obliged to make a bad bargain. Why should landlords be unwilling to submit to valuations? There was not a tradesman who left his house that had not his improvements or dilapidations valued, and compensation allowed

to the proper party. A legislative enactment on broad principles would do more good than codes of rules, which were sure to meet with objections from different parties (*hear*).

Mr. ALLAN RANSOME said that having had a somewhat large experience with reference to making bargains, and the effect and character of bargains as at present existing between landlord and tenant, he was very glad to see their attention at length turned to the position in which they stood, not "with" rights, but "without" rights (*hear*). It would frequently be the case that an individual who had a right in the soil would be considered to have an indefeasible right to do as he liked with his own: it therefore behoved them, in making their bargains, to see that those causes were removed which prevented their being judiciously made. There were laws in existence which had a great deal more to do with this part of the question than was generally supposed; he alluded particularly to that one law by which the landlord has at any time the right to enter upon the farm and distrain, to the detriment and ruin of the farmer, and to the great injustice of creditors. By the powers which this law gives to the landlord, it becomes as advantageous for him to deal with a man having no capital as with a man of capital; and so long as it continued to exist, there remained one great element for the introduction of over competition for farms, which prevented their making the fair bargain which they ought to make (*hear*). He recommended to the members of the club that in the discussion of this important subject they should bring together as many facts as possible, as the best mode of eliciting the truth and accomplishing the object they had in view (*hear*).

Mr. CUTHBERT JOHNSON said it struck him that too much stress had been laid upon the probability of deriving any advantage to the cause of the tenant farmer by means of legislative enactment (*hear, and a laugh*). For he could not help saying that he did see so much difficulty in the way of legislative interference, that he most earnestly implored them to discard from their minds the idea that any advantage could be obtained from acts of parliament (*hear, hear*). He saw most clearly, the most insuperable difficulties in the way of any Legislative interference between the lessor and the lessee (*hear*). He could not conceive any act of parliament that would over-ride a private bargain; he did, however, see the advantage of this discussion, and of the knowledge being diffused among the landlords, of the fact that benefit would accrue to themselves by a more liberal mode of treating their tenantry (*cheers*)—a very much more liberal principle of allowance for unexhausted improvement to the out-going tenant than that by which they had hitherto been actuated (*renewed cheers*), and on this subject he could not do better than read an extract from a paper which had been read at a meeting of the Loughborough Agricultural Association, as given in the sixth volume of the Transactions of the Royal Agricultural Society, page 47. "These suggestions as to securing to the outgoing tenant a claim on the unexhausted improvements originated in the committee of that society. Finding the general state of the agriculture of the midland counties inferior to the highly cultivated

farms of the counties of Norfolk and Lincolnshire, the committee were led to inquire what was it that produced the great improvement in the agriculture of those counties, and they found that, in the former (Norfolk), leases of twenty-one years were generally the system under which farms were let, and in the latter county (Lincolnshire) liberal agreements, or tenants' rights were given, in each case giving security for the capital expended in the various improvements on their farms." As he said before, he believed the great advantage of this discussion would arise in producing a liberal feeling amongst the landlords of England by showing them that it is to their interest to do these things; and he wished to lay great emphasis on the word "interest," for if they did not feel it to be to their interest to encumber themselves with greatly extended allowances to outgoing tenants, it was in vain to hope that they would ever adopt the system (*hear, hear*). He was glad to hear it stated on several sides that there was an increasing feeling that it would be to their "interest" to adopt this principle. It was stated, for instance, in the same volume as that to which he had already alluded, by Mr. Williams, of Brocklesby Park, near Brigg, that some of the more enlightened landlords of the great agricultural county of Lincoln were, with great advantage to themselves, going even so far as to allow compensation to the outgoing tenant for all the oil-cake which he had consumed on the farm for the last two years (*cheers*). He concluded by repeating his opinion of the extreme difficulty of proceeding in this matter by means of legislative enactment, and resumed his seat amid cheers.

Mr. CHEFFINS (steward to Lord Maynard) bore testimony to the disposition of the landlords to insert much more liberal clauses in their leases than formerly, and also to make allowances to good tenants.

Mr. SHAW (of Northampton) said he was of opinion that, in spite of all the difficulties which presented themselves, they ought to endeavour to-night to come to some sound practical conclusion (*hear, hear*). They were often told, as farmers, that they ought to till the land, that they ought to subsoil, and do this and do that—and employ the labourer. Now, he was one of those who certainly thought the labourers ought to be employed; and he endeavoured to do so as far as was within his power. But suppose he expended his capital in this way to any extent—he was sorry to make the remark—how did he know what his landlord might do? and then what became of him if he were called upon to give up his farm? (*Hear, hear*.) It was, however, high time that the tenant farmers of England should exert themselves, in order that they might derive some benefit from what they did (*hear, hear*). What they wanted must be plain to everybody; if they took farms, and improved the condition of those farms so as to increase the quantity of produce, nothing could be more fair and just than that they should reap remuneration (*hear, and cheers*). The justice of this must be evident to all. There were some landlords who had land, but not money to make the necessary improvements in it; now if the tenant had the capital and could do this, he had a right to enjoy the profit (*hear*). An acknowledgment of this principle would benefit the labourer as well as the tenant; and

the tenant farmer was not so blind but that he would do what was right when his interests were properly protected (*hear*).

Mr. TURNER said he had listened with some interest to what had fallen from the different gentlemen who had addressed the meeting. The question appeared to him to be summed up in this, that there was one of two things to be done, either to enter into agreements by leases, wherein certain conditions should be defined and clearly laid down, or at once to apply to the Legislature on the subject. Which was the right and proper mode of proceeding remained perhaps to be proved, but if to enter into leases for terms of years was the proper mode, why it would be as fair on the one side as the other. If, on the other hand, leases were not to be granted, then the tenant must have legislative protection before he could be expected to lay out his money on the estate of his landlord (*hear, hear*). There was another part of the subject which had been entered upon by Mr. Shaw, and that was the great loss which was sustained by the community from the practice of exhausting the estate or farm previously to quitting it; that was a point of vital importance. For if a person who was about to leave a farm took out all he could get from it previously, he would leave them to consider what would be the effect upon that farm (*hear, hear*).

Mr. SAMUEL BENNETT could not see any reason for applying to the Legislature, which took matters relating to the farmer quite enough into their own hands already (*hear, and a laugh*). But if the law-makers could rob them of what were their rights, they ought also to try and assist them; if on one side they could take away, it was only right on the other that they should give them something (*hear, hear*). If there ever was a period when the tenantry of this country had a proper opportunity to go to Parliament to ask for their rights, it was perhaps when Parliament had been doing everything it could to rob the tenant (*hear, hear*).

Mr. GROVE was of opinion that, before they went to Parliament, they should be in a position to show all the disadvantages under which they suffered. He could state one or two things which operated very prejudicially in his county, and which showed that certain clauses, which it was customary to insert, ought to be removed from all leases. One was this, that if a farmer became bankrupt, the landlord had the power at present of coming in, and sweeping off the whole of the produce and the whole of the benefit which had been applied to that land for years before. A case of this kind occurred recently on a farm which some of them knew had been farmed uncommonly well. The farmer became bankrupt, and the landlord—the liberal landlord—pounced upon the farm, to the exclusion of every one else; and all the improvements—draining to an immense extent, the fallows, the crops upon the land, and every thing else, he swept away as his own (*Hear, hear*). That was certainly one clause which ought to be removed from leases (*Hear*). The case which he had mentioned, he was sorry to say, was by no means an isolated one (*Hear*).

Mr. EMERY stood before them, perhaps, more in the capacity of a landlord than a tenant, although he

was in the double capacity (*Hear*). But he had associated so much with the tenantry of this country, that he felt embodied with the members of this club, of which he had been a member from its first formation (*Hear, hear*). They had heard a great deal of argument on both sides of this question, and he had yet to learn something fresh regarding the definition of tenant rights. The question seemed to be so surrounded with difficulty, and various usages, that he thought it utterly impossible for any legislative enactment to meet all the different customs of the country. He had this evening heard one gentleman advocate the efficiency of a corn rent, and state that the Duke of Bedford had adopted the principle. He admired the principle himself, thought it was a very good one, and adopted it more than thirty years ago with one of his tenants, who would be satisfied with nothing but a corn rent. Well, he went on for he did not know how many years, certainly more than twenty, when his (Mr. Emery's) son became of age, and certain farms passed into his possession. The tenant then in possession actually said, when the new leases were about to be prepared, "What is the use of all this? The difference is so little that it is quite absurd, and I would rather have a fixed rent" (*Hear, hear*). He mentioned this to show what was the result of a corn rent in twenty years (*Hear*). The difference was so little that it was more imaginary than real. He did not mean to say that the tenant farmer ought not to have protection; but there were many parts of England where the farms were principally grazing and dairy farms, and amongst these he had never been asked for a lease in his life; and if he had offered a lease, the reply was "I would much rather stay as I am." The result of his observations was, that enactments were of no use: the best thing was a reciprocal feeling between the landlord and tenant. If this existed, we should never hear those unfortunate and unpleasant remarks which were sometimes uttered against landlords (*Hear, hear*). It was natural, however, that where the landlord was oppressive, the tenant should find fault. He thought, that the arguments which had been used to-night would do great good when they went forth to the world, as they unquestionably would, through the instrumentality of the persons whom he saw taking notes for the public press (*Hear, hear*).

Mr. WOOD (Sussex) quite agreed with Mr. C. Johnson, that there would be great difficulty in getting anything by legislative enactment. He thought, however, that it was highly proper to lay down a general principle for tenant's rights, leaving them to adopt it or not as they should think proper (*Hear, hear*). He dissented from the principle of Mr. Ransome's remarks about competition, with regard to letting farms. The principle of competition was good in every thing else, and why should it not be good in agriculture? (*hear, hear*).

Mr. A. RANSOME explained that his object was only to diminish undue competition.

Mr. EDWARD MITCHESON was of opinion that the only mode of meeting the question before them was, by

forming a code of regulations for the outgoing tenant, which he suggested should be entrusted for formation to some six of the most practical farm surveyors (*hear, hear*). Let that code be widely published, and taken as the basis upon which leases should be entered into, and he thought great good might be effected. He was quite of opinion that such a code as he had proposed might be made, if the means suggested were adopted (*hear, hear*).

Mr. SHAW then rose to reply. He said he felt amply rewarded for the very imperfect mode in which he had laid the question before them in the satisfaction he now experienced in the fact, that not a single word had been offered, in all that had been said, in opposition to the principle which he had laid down in starting (*hear, and cheers*). Of every speaker who had got up, from first to last, not one had uttered a single syllable in contradiction of that which he hoped and trusted would one day form a portion of the law of the land (*cheers*). He had stated that his object was to adhere strictly to the principle, and that principle adopted, an effect would be produced on the public mind, and they would eventually obtain their object (*Hear, hear*). He trusted, by the spirit evinced to-night, that this would be one of the most important meetings which they had ever spent in this club-house; when they embarked in the discussion of a question involving not only the interests of the landlord and tenant and labourer individually, but of the whole country collectively (*loud cheers*). He entirely concurred in the observations of Mr. C. Johnson on one point, namely, when he said that his object would be to convince the landlords that it was to their interest to treat their tenants liberally (*Hear*); and if the love of gratification did not outweigh their interest they would doubtless pursue the latter (*Hear, and a laugh*). On the other hand, he did not agree with Mr. Johnson when he said the question was so surrounded with difficulty that no legislative enactment could be passed which would meet it. That, however, was rather a matter of detail. The landlords could—they had the power, if they pleased, to pass a measure which should by legislative enactment enforce a system of tenants' rights. As a striking exemplification of what they could do, when their own interests were involved, he would refer them to the act passed four years ago, and amended last session, namely, the act empowering money to be borrowed for the purpose of being expended in the drainage and improvement of entailed estates, with power to charge the estate with the same (*Hear, hear*). Ten years ago such an idea would have been laughed to scorn, especially in the House of Lords, where he regarded the law lords as the obstacles to every improvement of this description (*loud laughter and cheers*). Nevertheless, the day had begun to dawn when it was seen that it would be to the advantage of the owner of the life estate that the tenant should have power to make such a charge for the improvement of the estate; and with much difficulty, and a great deal of wheedling, a nobleman to whom they were all greatly indebted had at length got the thin edge of the wedge in (*Hear, hear*). He had got it in four years ago, and what had happened? Why he had got the powers of the act extended in a very considerable degree (*Hear*). And why? Because the

landlords were convinced that it was to their interest; and he was quite satisfied that all difficulties as to legislative enactment would at once cease when the landlords were convinced that it was to their interest to adopt a system of "tenant right" (*loud cheers*). He concluded by proposing the following resolution: "That in the opinion of this meeting a system of 'tenant right' would promote the interest of both landlord and tenant, and most materially conduce to the advancement of practical agriculture" (*Hear, hear*).

The CHAIRMAN thought there was one thing which had been rather overlooked, and that was the question as to what were tenant rights (*Hear*). He thought they had not kept so closely to the point as to what tenant rights were, and what the tenant had a right to demand, as they ought to have done. He did not find fault with this, because he thought the subject was one of too large a nature to be disposed of in one evening's discussion; and, for his own part, he hoped it would be resumed on a future occasion (*Hear*). Having this evening cleared away some of the rubbish ("*Hear,*" and a laugh), they would find their way more clear in their future discussions. Tenant's rights were easily found by valuation, when it was necessary as between landlord and tenant, on the part of the former; and he could not see why there should be any difficulty in the converse ("*Hear,*" and *cheers*); the only difference being, that of the value of what would pass from the landlord to the tenant, and that which would pass from tenant to tenant. For whatever the tenant had done in the way of draining, chalking, or liming, which should be of prospective advantage to the estate, and which could not be extracted from the land, for that the outgoing tenant ought in justice to be paid. It was a great hardship that the tenant, for some imagined offence, or perhaps for taking a single head of the game which he had reared, should suddenly find himself served with a six months' notice to quit, and be disturbed in the occupation of a farm, upon which he might have expended an amount of capital equal in some cases to one-third of the fee-simple (*Hear*.) It was to give confidence to the tenant in investing his capital, by the knowledge that he would get compensation if ousted, that the Legislature ought to interfere. He (the Chairman) knew what mutual agreements were with running leases. With a running lease, terminable at four or seven years, in the event of the landlord determining to change his tenant, the tenant would always have four or seven years to extract from the land that which he had put into it (*Hear*.) Why should the landlord have the power to destroy the tenant? Why should he have a power which was not conceded to any other class in the state? (*Hear, hear*.) The tenant had as good a right to compensation for what he had done to his farm, as a person who took a house and established a business had to ask a sum of money for the good-will of that house (*Hear*). He agreed in the opinion which had been expressed, that the bankrupt clause, inserted in tenants' leases, was a crying evil, and concluded by saying, that he hoped that the subject would be taken up by the Legislature (*Hear, hear*).

Mr. SHAW objected to the adjournment of the dis-

ussion, thinking it much better that it should go forth to the country at once that they had adopted the principle involved in the resolution which he proposed (*Hear, hear*).

Mr. BENNETT said he was desirous, if there was no objection, of engraving the following resolution upon Mr. Shaw's, viz., "That in the opinion of this meeting the character of the tenure and covenants under which tenant farmers, in too many instances hold, is disadvantageous both to the landlords, tenants, and labourers of the country, and have a strong tendency to retard the improvement of the soil and the increase of production; and that facts illustrative of the disadvantages arising from the present usages be collected and diffused, and that to this end the secretary be requested to communicate with the local farmers' clubs, requesting them to communicate the result of any discussion that may have taken place, and that a committee be appointed to collect from various places the usages in respect of bargains between landlords and tenants, and lease, contracts, and usages; such information to be reported to a future meeting of this club."

The CHAIRMAN said he also had a short resolution which he wished to submit to the meeting—"That the Legislature should give to the tenant an extended time to extract the capital he has invested in the soil, and

that the landlord should be compelled to pay a valuation for such improvements."

The sense of the meeting was, however, in favour of the adoption of Mr. Shaw's resolution only; and, after a short conversation, the others were withdrawn.

The CHAIRMAN then put Mr. Shaw's motion to the vote, which was carried unanimously.

It was subsequently arranged that the discussion of the details of the question should be taken at the monthly meeting, on the first Monday in January.

Thanks were then voted to Mr. Shaw for the able manner in which he brought forward the question for discussion, and to Mr. Baker for his conduct in the chair; and the Meeting broke up.

On Thursday, Dec. 11, the Members of the Farmers' Club had their annual dinner, at Radley's Hotel, New Bridge Street, Blackfriars. There were about 90 gentlemen present. The chair was taken by Mr. Robert Smith, of Burley, Lincolnshire, who was supported on his right by Mr. Henry Overman, of Norfolk, and on his left by Mr. Samuel Bennet, of Berks. The vice-chair was occupied by Mr. Hobbs. Amongst the company we observed—the Rev. Charles Blair Warrene; Mr. John Hutley, Waltham; Mr. B. Gibbs; Mr. Shaw; Mr. A. Ransome; Mr. Webb, &c., &c.

SMITHFIELD CLUB DINNER AT THE FREEMASONS' TAVERN.

The usual anniversary dinner of the members of the Smithfield Cattle Club took place in the large hall of the Freemasons' Tavern, on Friday, Dec. 12, at five o'clock. His Grace the Duke of Richmond, the President of the Society, was in the chair. There was a very full attendance of members—the number who sat down to dinner being from 160 to 170. Amongst the company we noticed Mr. Pusey, M.P.; Col. Wood, M.P.; Col. Sibthorp, M.P.; Sir Charles Clarke; C. T. Towers, Esq.; B. Gibbs, Esq.; H. Gibbs, Esq.; W. Shaw, Esq.; W. F. Hobbs, Esq.; T. Umbers, Esq.; — Tattersall, Esq.; Jonas Webb, Esq., &c., &c.

After the removal of the cloth,

The noble CHAIRMAN said: I rise to propose the first toast: it is "the health of the illustrious Lady who reigns over us." Long and prosperous may her reign be over a happy, contented, and religious people; and I hope and trust that Providence will bestow on her every felicity that can make her reign long and happy (*cheers*).

Drunk with three times three.

The CHAIRMAN.—The next toast I have to propose is, "the health of the Queen Dowager, Prince Albert, the Prince of Wales, and the rest of the Royal Family." The Queen Dowager is known to you all for her extensive charities; and Prince Albert, as you are aware, is a member of this Club. He is a better farmer this year than he was last year, for he has this year obtained a

prize. With respect to the Prince of Wales, we all look to him with interest; and as we hope that he will in due time become the sovereign of these realms, we are anxious to see him educated in those sound religious principles which are calculated to make his reign prosperous. Of the other members of the Royal Family it is enough to say, that they are the children of George III., the farmers' friend. I beg leave to propose the "Queen Dowager, Prince Albert, the Prince of Wales, and the rest of the Royal Family" (*cheers*).

Drunk with the usual honours.

The CHAIRMAN.—Gentlemen, I rise now, I can assure you, labouring under no ordinary feelings, and in no ordinary character. This Club has sustained a severe loss by the melancholy and unexpected event which has deprived us of the tried and valued services of our late able president. You know that much of the prosperity and beneficial effects of the Club, over which he presided for a period of twenty years, was owing to his extensive influence and personal exertions, which he used for the society. Before his election the Club was for some years without any president, and it was fast falling into decay. But by his management, and his winning and affable manner, he was enabled to restore it to prosperity, and to place it on a basis which its increasing influence shows to be good and sound. I believe that the success of the Club is to be attributed to the integrity of his purpose, the urbanity of his manners, the kindness

of his heart, the friendly feeling he always evinced, his practical knowledge, and his desire to mix at all times with the tenantry. I am one of those who believe that his deep devotion and zealous perseverance in the cause of agriculture will hand his name down to posterity as a benefactor of the human race. But I shall not trespass any longer on your time on this painful subject. I have been impelled by my own personal feelings to say this much; and I now call upon you to drink to the memory of a just and upright man, who carried with him to the grave the good opinion of all, and the blessings of the poor whose wants he relieved without ostentation. I give you "The memory of John Charles Earl Spencer, a true English country gentleman."

Drunk in solemn silence.

The CHAIRMAN.—Gentlemen: the next toast which we are accustomed to drink on occasions like the present, is, "Prosperity to the Smithfield Club." It cannot be doubted, from the attendance that annually assemble at its meetings, that the Club has tended greatly to the improvement of stock. I understand from the Judges that there are many good beasts exhibited this year, but the show on the whole has not been equal to last year's show; nor are there so many beasts exhibited as on former occasions. I myself observed, although I do not pretend to know much about cattle, but I will venture an opinion on sheep—I have observed that in short wools the Show was no way inferior to former ones. During the fifteen years that I have regularly attended the exhibition of the Smithfield Club, I must say that I never saw a better show of short wools than on the present occasion. Perhaps some may think that I say this because I carried a second prize; but I assure you it is not so. Other counties besides Sussex have been successful this year. My Cambridge friend, Mr. Webb, and a Berkshire man also, have been successful competitors. Those counties, if they exert themselves, will get on still better; and their success must in part at least be ascribed to their frequent visits to the show-yard. But I will not occupy your time longer. I am happy to say that the Club is getting on very well. It is a most useful institution, and one of great merit; one in which party politics are set aside, and where we meet as friendly farmers. When we go back to our counties, each pursues his own line of politics; but here we are united (*cheers*). I, therefore, now ask you to drink to "The Prosperity of the Smithfield Club, may we have a large meeting next year, and may the Institution continue to increase in usefulness" (*immense cheering*).

Drunk with all the honours.

The CHAIRMAN.—Gentlemen: at this stage of our proceedings, it is usual to read over the award of the Judges, that we may know who have obtained prizes. Although the reading of the list may be dry to the unsuccessful competitors, I am pretty sure that it will not annoy the successful ones (*laughter*).

The noble Duke then read over the following list, and called the fortunate competitors to receive the

prizes, which he accompanied with appropriate remarks, which were received with applause.

JUDGES.—For Beasts and Long-wooled Sheep: Mr. T. Parkinson, Mr. G. L. Franklin, Mr. T. Harris. For Short-wooled Sheep and Pigs: Mr. Tanner, Mr. R. Boy, Mr. W. Stace.

OXEN OR STEERS.

CLASS I.—Oxen or Steers, of any breed, under five years old, without restrictions as to feeding, yet the kind or kinds of food must be certified.

His Royal Highness Prince Albert, of Windsor Castle, a three years and ten months old short-horned ox, bred by the late Lord Huntingfield, and fed on cake, turnips, tares, hay, meal, and potatoes. Travelled to the show by van 22 miles. Second prize, £10.

Mr. John Davics, of Warden, near Biggleswade, Bedfordshire, a three years and one and three-quarter month old improved short-horned steer, bred by himself, and fed on grass, hay, oil-cake, Swedish turnips, and cabbages. Travelled to the show by van 45 miles. Commended.

The Most Hon. the Marquess of Exeter, of Burghley, near Stamford, Northampton, a two years and eleven months old Durham ox, bred by his lordship, and fed on grass, hay, Swedish turnips, oil-cake, bean meal, and linseed oil. Travelled to the show by van 89 miles. Highly commended.

Mr. Robert Martin Layton, of Thorney Abbey, near Peterborough, Cambridge, a four years and eight months old Hereford ox, bred by Mr. Paul Prosser, of Garway Court, near Mounmouth, Hereford, and fed on hay, green clover, Swedish turnips, carrots, and linseed-cake. Travelled to the show on foot by miles, by van sixty miles, and by railway ninety-eight miles. First prize, £20, silver medal, and gold medal.

Mr. John Steeds, of Frome Sedwood, near Frome, Somerset, a four years and ten months old Hereford ox, bred by Mr. Thomas Roberts, of Ivingtonbury, near Leominster, Hereford, and fed on grass, hay, bean and barley-meal, and roots. Travelled to the show by van twelve miles, and by railway 108 miles. Commended.

Mr. William Woodward, of Bredons Norton, near Tewkesbury, Worcester, a three years and nine months old improved short-horned steer, bred by himself, and fed on grass, hay, Swedish turnips, bean, pea, barley, and mixed meal, and linseed cake. Travelled to the show by van twenty-six miles, and by railway ninety-five miles. Second prize, £15.

CLASS II.—Oxen or Steers, of any breed, under six years old, weight ninety stone and upwards, that shall not have had cake, corn, meal, seeds, grains, or distillers' wash, during nine months previous to the 1st of May, 1845.

Mr. Henry Adams, of Calcut, near Cricklade, Wilts, a four years and eight months old Hereford ox, bred by Mr. Charles Mason, of Tarrington, near Ledbury, and fed on hay, grass, turnips, and 1,800 lbs. of cake. Travelled to the show by van eighty-four miles. Second prize, £20.

His Grace the Duke of Bedford, of Woburn Abbey, Bedford, a four years and eight months old Hereford ox, bred by his Grace, and fed on barley-meal, turnips, hay, chaff, and 2,000 lbs. of linseed. Travelled to the show by van forty-one miles. Third prize, £10.

Mr. Thomas White Fouracre, of Durston, near Taunton, Somerset, a three years and eleven months old Devon steer, bred by himself, and fed on hay, clover, vetches, roots, and about twelve bushels or 720 lbs. of bean and barley-meal. Travelled to the show on foot six miles, and by railway 163 miles. First prize, £30, and silver medal.

CLASS III.—Oxen or Steers, of any breed, under five years old, under 100 stone and above 70 stone weight, that shall not have had cake, corn, meal, seeds, grains, or distillers' wash, during nine months previous to the 1st of May, 1845.

Mr. Henry Adams of Calcut, near Cricklade, Wilts, a four years and eight months old Hereford ox, bred by Mr. Charles Mason, of Tarrington, near Ledbury, Hereford, and fed on grass, hay, turnips, and 1,800lbs. of cake. Travelled to the show by van 84 miles. Commended.

Mr. Thomas Umbers, of Wappeubury, near Royal Leamington Spa, Warwick, a three years and nine months old North Devon steer, bred by himself, and fed on grass, hay, turnips, 760lbs. of cake, and 20 bushels of barley and pea meal. Travelled to show by van 5 miles and by railway 103 miles. First prize, £15, and silver medal.

The Right Hon. the Earl of Warwick, of Warwick Castle, Warwickshire, a three years and seven months old Hereford steer, bred by the Right Hon. the Earl of Oxford and Mortimer, of Eywood, near Kington, Hereford, and fed on grass, hay, turnips, 798lbs. of cake, 130lbs. of bean meal, and 130lbs. of barley meal. Travelled to the show on foot 5 miles, and by railway 100 miles. Second prize, £10.

CLASS IV.—Oxen or Steers, of any breed, not exceeding four years and three months old, under 85 stone weight, that shall not have had cake, corn, meal, seeds, grains, or distillers' wash, during nine months previous to the 1st of May, 1845.

Mr. Thomas White Founacre, of Durston, near Tamton, Somerset, a three years and eleven months old Devon steer, bred by himself, and fed on hay, clover, vetches, roots, and 720 lbs. of bean and barley meal mixed. Travelled to the show on foot 6 miles, and by railway 163 miles. First prize, £10, and silver medal.

Mr. Walleth Goodale, of Boroherry House, near Peterborough, Northampton, a two years and eleven and three-quarter months old Hereford steer, bred by Mr. John Bishop, of Aldon, near Ludlow, Salop, and fed on hay, grass, Swede turnips, and 300 lbs. of cake. Travelled to the show on foot 4 miles, and by railway 110 miles. Second prize, £5.

CLASS V.—Oxen or Steers, of any breed, under four years and six months old, and under 80 stone weight, without restrictions as to feeding, yet the kind or kinds of food must be specified.

His Royal Highness Prince Albert, of Windsor Castle, a four years old West Highland ox, fed on cake, turnips, tares, hay, meal, and potatoes. Travelled to the show by van 22 miles. Commended.

The Right Hon. the Earl of Leicester, of Holkham, Norfolk, a four years and four months old North Devon steer, bred by his lordship, and fed on Swedish turnips, mangold-wurtzel, hay, oil-cake, and bean-meal. Travelled to the show by van 40 miles, and by railway 70 miles. Commended.

Mr. Thomas Umbers, of Wappenbury, near Royal Leamington Spa, Warwickshire, a three years and six months old North Devon steer, bred by himself, and fed on grass, hay, turnips, barley and pea meal, and oil-cake. Travelled to the show on foot five miles, and by railway 103 miles. The prize £10, and silver medal.

COWS AND HEIFERS.

CLASS VI.—Fattened Cows or Heifers, under five years old. Freemartins and spayed heifers are not qualified.

Mr. William Bennett, of Lewsey Farm, near Dunstable, Bedfordshire, a four years and seven months old improved short-horned heifer, bred by himself, and fed on grass, hay, turnips, cabbage, and oil-cake. Travelled to the show by van 36 miles; has had one calf. Second prize, £10.

Mr. William Firth, of Kirkstall, near Leeds, Yorkshire, a four years and eight months old short-horned heifer, bred by Mr. Jonas Whitaker, of Burley, near Otley, Yorkshire, and fed on hay, cake, turnips, and bean meal. Travelled to the show by van 3 miles, and by railway 234 miles. Commended.

Mr. Drinkwater Scott Hlayward, of Frocester Court, near Stroudwater, Gloucester, a four years and eleven months old short-horned cow, bred by himself, and fed on oil-cake, barley, bean and lentil-meal, hay, mangold-wurtzel, Swede turnips, and cabbage. Travelled to the show by van 5 miles, and by railway 101 miles; has had one calf. Third prize, £5.

Mr. W. Trinder, of Wantage, Berkshire, a three years and ten months old Durham heifer, by the Right Hon. Lord Sherborne, of Sherborne, near Northleach, Gloucester, and fed on hay, cabbage, Swedes, mangold-wurtzel, oat, pea, and barley meal, and oil-cake. Travelled to the show on foot two miles, by van 52 miles, and by railway 63 miles. First prize, £20, silver medal and gold medal.

CLASS VII.—Fattened Cows, of five years old and upwards. Free-martins and spayed heifers are not qualified.

Mr. Morris Edward Lythall, of Hartshill, near Atherstone, Warwick, a five years and seven months old Durham cow, bred by Mr. John Bowers, of Braunston, near Daventry, Northampton, and fed on grass, linseed-cake, and barley meal. Travelled to the show by van 11 miles, and by railway 94 miles; has had one calf. Second prize, £5.

The Right Hon. the Earl of Radnor, of Coleshill House, near Farringdon, Berkshire, a five years and one month old Hereford cow, bred by Mr. Thomas Yeld, of the Broome, near Leominster, Hereford, and fed on hay, corn, cake, Swedes, and cabbages. Travelled to the show by van six miles, and by railway 71 miles; has had one calf. First prize, £20, and silver medal.

CLASS VIII.—Fattened Cows of five years old and upwards, that shall have had at least two live Calves at separate births.

The Right Hon. the Earl of Leicester, of Holkham, Norfolk, an eleven years and two months old North Devon cow, bred by the late Mr. G. Talbot, of Temple Guiting, near Winecomb, Gloucester, and fed on Swedish turnips, mangold-wurtzel, hay, oil-cake, and bean-meal. Travelled to the show by van 40 miles, and by railway 70 miles; has had four calves. First prize, £15, and silver medal.

The Hon. M. W. B. Nugent, of Higham Grange, near Hinckley, Leicester, a ten years and six months old pure Leicester or long-horned cow, bred by Mr. Edward Thornton Twycross, of Canley, near Coventry, Warwick, and fed on hay, rape-cake, grass, and boiled barley. Travelled to the show on foot 14 miles, by van 11 miles, and by railway 101 miles; has had five calves. Commended.

Mr. John Smith, of Welton-Garth, near South Cave, Yorkshire, a seven years and two months old short-horned sow, bred by Mr. Samuel Beecroft, of Anlaby-road, near Hull, Yorkshire, and fed on linseed-cake, hay, turnips, grass, and green tares. Travelled to the show on foot 1½ mile, and by railway 232 miles—has had three calves. Commended.

Mr. James W. Walters, of Barnwood, near Gloucester, a nine years old Hereford cow, bred by Mr. John Walker, of Lulsley Court, near Worcester, and fed on hay, oil-cake, carrots, mangold-wurtzel, and barley meal. Travelled to the show on foot three miles, and by railway 114 miles; has had four calves. Second prize, £5.

EXTRA STOCK.—CATTLE.

Mr. Nathaniel Bland, of Randal's Park, near Leatherhead, Surrey, a three years and ten months old Durham short-horned steer, bred by the late Mr. W. Calvert, of Hunsdon, near

Ware, Herts, and fed on grass, oil-cake, hay, carrots, Swedes, bean-meal, and bruised linseed. Travelled to the show by van 20 miles. Silver medal.

NOT COMPETING.

The executors of the late Right Hon. Earl Spencer, of Althorp Park, Northampton, a four years and ten months old short-horned ox, bred by the late Earl Spencer, and fed on grass, hay, turnips, mangold-wurtzel, and oil cake. Travelled to the show by van 10 miles, and by railway 66 miles. Highly commended.

The executors of the late Right Hon. Earl Spencer, of Wiseton, near Bawtry, Nottingham, a four years and two months old short-horned ox, bred by the late Earl Spencer, and fed on oil-cake, barley and bean-meal, turnips, cabbages, and hay. Travelled to the show by van 21 miles, and by railway 172 miles. Highly commended.

The executors of the late Right Hon. Earl Spencer, of Wiseton, near Bawtry, Nottingham, a nine years and four months old short-horned cow, bred by the late Earl Spencer, and fed on oil-cake, barley, and bean meal, turnips, cabbages, and hay. Travelled to the show by van 21 miles, and by railway 172 miles. Highly commended.

SHEEP.

CLASS IX.—Long-woolled fat wether Sheep, one year old, that have never had cake, corn, meal, seeds, or pulse.

Mr. John Painter, of Burley, near Oakham, Rutland, a pen of three twenty-months old new Leicester wethers, bred by himself. First prize, £20, and silver medal.

Mr. Thomas Twitchell, of Willington, near St. Neot's, Beds, a pen of three twenty-months old pure Leicester wethers, bred by himself, from rams hired of Mr. Samuel Bennett, of Bickerings Park, near Woburn, Beds. Second prize, £5.

CLASS X.—Long-woolled fat Wether Sheep, one year old, under 8 stone weight, that have never had cake, corn, meal, seeds, or pulse.

Mr. Thomas Umbers, of Wappenbury, near Royal Leamington Spa, Warwickshire, a pen of three twenty-months old new Leicester wethers, bred by himself. Prize £10, and silver medal.

CLASS XI.—Long-woolled fat Wether Sheep, one year old, without restrictions as to feeding.

The Right Hon. the Earl of Aylesford, of Packington, near Coventry, Warwick, a pen of three twenty months old Leicester wethers, bred by his lordship, from rams hired of Mr. Pratt, of New Fields, Southam. Commended.

Mr. Richard Redgrave, of Bunker's Hill, near Boughton, Northampton, a pen of three twenty-one months old Leicester wethers, bred by himself, from rams hired of Mr. Manning, of Orlingbury, near Wellesborough, Northampton. Second prize, £5.

Mr. Thomas Twitchell, of Willington, near St. Neot's, Beds., a pen of three twenty months old pure Leicester wethers, bred by himself, from rams hired of Mr. Samuel Bennett, of Bickerings Park, near Woburn, Beds. First prize, £20, and silver medal.

CLASS XII.—Long and Short-woolled cross-bred fat wether Sheep, one year old, without restrictions as to feeding.

Mr. James Hitchman, of Little Milton, near Wheatley, Oxford, a pen of three twenty-one months old Hampshire and Oxfordshire cross wethers, bred by himself. First prize, £10, and silver medal.

Mr. Charles Tomson, of Sundon, near Luton, Beds., a pen

of three twenty-one months old Down and Gloucester cross wethers, bred by himself. Second prize, £5.

EXTRA STOCK.—LONG-WOOLLED SHEEP.

Mr. Charles Large, of Broadwell, Oxfordshire, a fifty-six months old new Oxfordshire ewe, bred by himself. Highly commended.

Mr. William Sanday, of Holme Pierrepont, Nottingham, a fifty-seven months old Leicester ewe, bred by himself. Silver medal.

Mr. Wm. Smith, of Gaydon, near Kineton, Warwick, a 116 months old improved Cotswold Ewe, bred by himself, from a ram hired of Mr. Garner, of Aldsworth, Gloucestershire. Highly commended.

CLASS XIII.—Short-woolled fat Wether Sheep, one year old, without restrictions as to feeding.

Mr. David Barclay, M.P., of Great Bookham, near Leatherhead, Surrey, a pen of three twenty-one months old Southdown wethers, bred by himself. Second prize, £5.

His Grace the Duke of Richmond, of Goodwood, near Chichester, Sussex, a pen of three twenty-months old Southdown wethers, bred by his Grace. Commended.

Mr. Samuel Webb, of Babraham, near Cambridge, a pen of three twenty-months old Southdown wethers, bred by himself, from rams hired of Mr. Jonas Webb, of Babraham. First prize, £20, silver medal and gold medal.

Mr. John Williams, of Buckland, near Farringdon, Berks, a pen of three twenty-one months old Southdown wethers, bred by himself. Commended.

CLASS XIV.—Short-woolled fat Wether Sheep, one year old, under 8st. weight, without restrictions as to feeding.

Mr. John Harris, of Hinton, near Abingdon, Berks, a pen of three eighteen months old Southdown wethers, bred by himself. The prize £10 and silver medal.

His Grace the Duke of Richmond, of Goodwood, near Chichester, Sussex, a pen of three twenty-months old Southdown wethers, bred by his grace. Highly commended.

CLASS XV.—Short-woolled fat Wether Sheep, two years old, without restrictions as to feeding.

His Grace the Duke of Richmond, of Goodwood, near Chichester, Sussex, a pen of three thirty-two months old Southdown wethers, bred by his grace. Second prize, £5.

Mr. Samuel Webb, of Babraham, near Cambridge, a pen of three thirty-two months old Southdown wethers, bred by Mr. H. J. ADean, of Babraham, from rams hired of Mr. Jonas Webb, of Babraham. First prize, £20, and silver medal.

EXTRA STOCK.—SHORT-WOOLLED SHEEP.

Mr. John Harris, of Hinton, near Abingdon, Berks, a thirty-two months old Southdown wether, bred by himself. Highly commended.

Mr. W. B. Harris, of Hinton, near Abingdon, Berks, an eighteen months old Southdown wether, bred by himself. Silver medal.

PIGS.

CLASS XVI.—Pigs of any breed, above thirteen and not exceeding twenty-six weeks old.

Mr. Charles Eley, of Heathfield Farm, near Homslow, Middlesex, a pen of three eighteen weeks and two days old Berkshire and Yorkshire pigs, bred by Mr. C. Eley, sen., and fed on buck wheat, barley, and pea meal, and milk. First prize, £10, and silver medal.

The Right Hon. the Earl of Radnor, of Coleshill House, near Farringdon, Berkshire, a pen of three eighteen weeks and six

days old Colleshill pigs, bred by his lordship, and fed on whey, skimmed milk, barley meal, and potatoes. Second prize, £5.

CLASS XVII.—Pigs of any breed, above twenty-six and under fifty-two weeks old.

Mr. W. F. Hobbs, of Marks Hall, near Kelvedon, Essex, a pen of three twenty-nine weeks and two days old improved Essex pigs, bred by himself, and fed on oats, peas, meal, potatoes, mangold-wurzel, and milk. Second prize, £5.

Mr. H. M. L. Whiting, of Heston, near Hounslow, Middlesex, a pen of three thirty-two weeks and four days old improved Buckinghamshire Pigs, bred by himself, and fed on barley and pea meal, skimmed milk and linseed. First prize, £10, and silver medal.

EXTRA STOCK.—PIGS.

Mr. H. M. Whiting, of Heston, near Hounslow, Middlesex, a thirty-two weeks and four days old improved Buckinghamshire pig, bred by himself, and fed on barley and pea meal, skimmed milk, and linseed. Silver medal.

The CHAIRMAN then rose, and proposed the "Health of the Successful Competitors," and said that those who have been fortunate enough to obtain prizes should attend personally to receive them.

Drunk with three times three.

Mr. UMBERS being called upon, rose and said—My Lord Duke and Gentlemen, I beg leave to return thanks for myself and the other successful competitors. As long as I am connected with the Club, I shall always try for the gold medal, which is the object of my highest ambition; and every one else should do so also. The Duke himself has done so, and two years ago he received a second prize, and he has also received a first prize. I follow the same course, and I hope that next year I shall be able to obtain greater merit than this year (*cheers*).

Mr. HEAD.—My Lord Duke, I am certainly very glad that I have been successful this day, and I hope to be still more so next year, and show superior animals in the yard. These prizes are encouraging, and tenants cannot do too much to obtain them. My friend Webb has been at the top of the ladder, and I hope to be so too. My Lord Duke and Gentlemen, I drink all your very good healths (*cheers*).

Mr. BENNETT.—My Lord Duke and Gentlemen, in conjunction with the other successful competitors, I beg leave to return you my thanks for drinking our healths. My object is to get to the top of the tree, and to keep there as long as I can (*cheers*).

The CHAIRMAN.—I now propose the "Health of the Successful Competitors in Long-woolled Sheep" (*cheers*).

Drunk with applause.

Mr. PAYNTER, of Burleigh, being called on, said,—My Lord Duke and Gentlemen, after three or four years trial, I am not a little proud to be one of the successful competitors this day, and shall try to gain another prize next year—others should try too. I return you my best thanks for drinking our healths (*cheers*).

Mr. PUSEY.—My lord Duke and Gentlemen, it has fallen to my lot to propose "The Health of your noble President" (*cheers*). I sincerely congratulate the Society on their new President; but although new as our President, his Grace is not a new acquaint-

ance (*cheers*). It is not for me—a young member—to introduce him to you; for he is well known to you already. I anticipate the greatest advantages to the Society from having the noble Duke at its head. It is necessary to have one of high rank at the head of such an Institution; and the Duke's character endears him to all. In my opinion, the Duke of Richmond sets a bright example to his compeers. It was an old saying of the monks, "That they should work and pray;" and I wish the aristocracy would do so likewise, and follow the example of the Duke. I have only one other observation to make. It is almost betraying private confidence to make it, because it has been communicated to me at the table. The noble Duke has told me, that when he was in the Highlands, he passed his time riding from seven o'clock in the morning to seven o'clock in the evening visiting his tenantry; not for the purpose of discovering faults, but laying out money on their farms and bettering their condition (*cheers*). That, gentlemen, is a noble example, and should be followed by every proprietor. Gentlemen, I propose to you "The Health of the Duke of Richmond," who I am proud to call our President (*immense cheering*).

Drunk with three times three.

The CHAIRMAN (who was received with great cheering) said: Gentlemen, I can assure you that there is nothing in life which affords me greater pleasure than to be of service to the farmers of the country, and I shall always deserve that confidence which heretofore, I am proud to say, they have reposed in me. As a member of the Smithfield Club, I have attended the annual exhibition ever since my election fifteen years ago, with the exception of one year, when I was prevented by domestic affliction. I joined the Club, because I thought it an important and beneficial institution for the country; and I think that importance must be manifest to every one; and I believe that to this room the Royal Agricultural Society owes its formation (*cheers*). Gentlemen, I have been often an unsuccessful competitor; sometimes I have obtained a first prize; sometimes been commended, and sometimes went unnoticed. I strongly recommend every member to persevere. I appeal to every one present whether they are not satisfied with the decision of the Judges. I confess that I have this year been fairly beaten. Mr. Webb and my Berkshire friend must do better next year; and if they do not, I shall certainly get the gold medal (*cheers*). I must say that I am extremely proud of the honour of being President of the Smithfield Club, and I feel grateful to the tenant farmers of the country for their confidence, which I have no means of adequately repaying. I am in the habit of meeting the tenant farmers, not only because I think it my duty to do so as a landlord, but also on account of the pleasure I derive from conversing with them; and I am much gratified by the honour you have conferred on me in electing me President of this Club (*cheers*). I may not be of much use to you, but I shall at any rate show an example to young men that as landlords it is

their interest and their duty to mix with their tenantry (*cheers*), that they should co-operate with their tenants, and consider them as part of their family (*cheers*); that they should attend every market and every agricultural meeting; and I am sure the tenantry will repay such conduct (*cheers*). It is of the greatest importance that the landowner and the occupier should be on good terms. You are all anxious for agricultural improvement; but the tenant cannot do so unless he is backed by his landlord (*cheers*). I thank you sincerely for the manner in which you have received me; and I hope I shall always have at heart the interests and welfare of the tenant and labourer; and although I am only this year a second class man, I expect to beat my friends from Cambridge and Berkshire next year (*cheers*).

Mr. S. WEBB briefly returned thanks. He observed that, pursuing the advice given by their noble President, when he first became an exhibitor at the Smithfield Club, he expected on some occasions to be successful; and believing that he possessed a breed of sheep, qualified with constitution, form, and symmetry, equal, if not superior, to any he had ever seen, he should not have been satisfied with his own exertions until he had obtained the highest point of honour and encouragement offered by the Club. Finding himself now in that proud position, he need not say it gave him great pleasure and satisfaction, and again begged to thank them for the compliment paid him.

Mr. HARRIS.—My Lord Duke and Gentlemen, it is an old Berkshire saying to persevere, and although I wont promise to obtain the prize next year, I shall try to do so. Gentlemen, I drink all your good healths.

The CHAIRMAN.—Gentlemen, I propose the "Healths of the Successful Competitors in Pigs."

Mr. HOBBS.—My Lord Duke and Gentlemen, I return you my thanks, being a successful competitor for pigs. As I am a Steward of the Club for three years, I shall not be able, until the expiration of my term of office, to be again a successful competitor, in consequence of the rules of the Club. But until that time I shall do all I can to improve male and female swine of the Essex breeds; and I hope when I retire I shall show some advancement, at least I will try hard (*cheers*).

The CHAIRMAN.—With respect to what has fallen from Mr. Hobbs about the exclusion of the Steward from competing for pigs, the reason which induced us to adopt it is, that as pigs are more generally the food of the poor rather than that of the rich, we thought it right to make the exclusion, that the poor might have a better chance of competing themselves (*cheers*).

The CHAIRMAN.—Gentlemen, with respect to the late Lord President's three beasts that were exhibited in the Yard, I beg to observe that the present Lord Spencer did not wish his cattle to enter into the competition, but he permitted them to be shown in the Yard; and although this was contrary to the rules, I am highly gratified that the exception has been made in favour of the beasts of Earl Spencer (*cheers*).

The CHAIRMAN.—I have to call on Mr. Slater, the largest purchaser of beasts at the Smithfield Show, to come forward and receive the gold medal.

Mr. SLATER having done so,

The CHAIRMAN said—Gentlemen, I now rise to propose "the healths of the butchers of the metropolis;" and with that toast I shall couple the name of Mr. Slater, as being the largest purchaser. I need not detain you to show the great importance to the agriculturist having liberal men to deal with (*laughter*). It is important that the butchers should come to us and give us good prices, and the butchers of the metropolis and Mr. Slater are doing so (*cheers*). We have to thank Mr. Slater for his right conduct, and I propose his health, and that of the butchers of the metropolis.

Mr. SLATER returned thanks.

The CHAIRMAN.—Gentlemen, I have now to propose "The Unsuccessful Competitors," and to express my hope that they will be more fortunate next year. It was my lot for many years to return thanks for that class, and it is the class always the most difficult to return thanks for. I hardly know who to call upon to return thanks on this occasion; but I have always, when doing so, said that the judges had given a fair decision. Competitors must not be prejudiced about their own stock, and by such prejudice put a false construction on the award of the judges. I ask the unsuccessful competitors as Englishmen, not to be faint hearted from their want of success. Let them profit by what they see around them, and if I occupy this chair long, I shall have the pleasure, on a future occasion to give them prizes. The health of the unsuccessful competitors.

Mr. BEAZLY.—My lord duke and gentlemen, the custom of returning thanks for the unsuccessful competitors is more laudable "in the breach than the observance." I see my friends around laughing at me, but I can afford to be laughed at; I think I have been successful as often as most others, and I hope next year to be again successful. I have great satisfaction in saying that the prizes have been awarded with great impartiality. I am sorry that my unsuccessful neighbours won't stand up with me, and I think it very shabby of them (*laughter*).

The CHAIRMAN.—Gentlemen, I beg to propose "the health of the vice-presidents," and to couple with it the name of my friend on my left, Mr. Pusey (*cheers*), whose name stands so high in the agricultural world, and particularly in connexion with improvements in agricultural implements. "Mr. Pusey and the Vice-Presidents."

Drunk with three times three.

Mr. PUSEY.—My Lord Duke and Gentlemen: I am exceedingly obliged to you for the toast, although but an unworthy representative of the Vice-Presidents. I was glad to see that that district with which I am connected west of Berkshire had made so good a show; that district was once famed, and its fame is again reviving. I am happy that my partner—but he is not my partner, for he won the gold medal—made so good an appearance in the yard. Mr. Harris stands well in the sheep class, and Mr. Moore for pigs; so that at least we have shown that we know something. I am very glad to see so good a meeting as the present, but although we have done much, we have yet much to accomplish. And my opinion is that

the question is not as to what is or ought to be done, as the means wherewith to do it. We want the help of the aristocracy (*cheers*). With respect to security in tenure, the noble Duke in the chair did much last session; but there is more to be done; and I say that the tenant who lays out money on his land should have a legal right to get it back (*cheers*). I shall not enter into details, but I do say that nothing can be more absurd than the present mode. We know that ploughing and harrowing alone will not make turnips grow; and can it be expected that the tenant will pay 200*l.* or 300*l.* for guano or anything else without security or remuneration? I am very glad that the Farmers' Club have taken up this question. It is certainly difficult to draw up the conditions, but I have at this moment engaged a surveyor to consider the matter (*cheers*). I beg to thank you for the honour you have done the vice-presidents.

Mr. BEAZLY proposed "The Health of the Judges of the Show," who had so ably performed their arduous duties.

The CHAIRMAN.—I need not say that I heartily concur in the proposal. Gentlemen, something has been said of the tenant right, and I have to say that I have always advocated, that where the tenant has expended money in improving his farms, he should be paid for its unexhausted value. I have never hesitated, and never will, to give a lease to every tenant who asks for one. If the tenant expends 100*l.* in lime, he ought to have remuneration to the utmost extent. I said so last year in Parliament, and I intended to have brought forward a measure on the subject; but there is much delicacy in the matter. The interests of the landlord and the tenant are one and the same. I hope you will not adopt new theories to the contrary. I am anxious that the rights of both should be preserved (*cheers*).

Mr. PARKINSON returned thanks on behalf of the Judges.

The CHAIRMAN then proposed "The Health of the Stewards," whose arrangements were deserving of all praise.

Mr. MILLWARD returned thanks.

The CHAIRMAN.—I rise to propose "The Health of Mr. Gibbs, our hon. Secretary" (*cheers*), a gentleman who has ably conducted the business of the Society, and has always shown the greatest impartiality in the discharge of his arduous duties (*cheers*).

Mr. GIBBS returned thanks, and expressed his great regret at the event which had deprived the club of the late president, on whose conduct and qualities he paid a high eulogium; but, although the club had been deprived of the services of one distinguished president, there was cause for congratulation that they had been fortunate to secure the services of another.

The CHAIRMAN: The next toast I have to propose is, "The health of the Father of the Club—the Sire of the two Messrs. Gibbs"—to whom we owe so much for their services. In the absence of the father of the club, I am happy to see my friend Mr. Chapman filling his place opposite to me (*cheers*).

Mr. H. GIBBS returned thanks, and reviewed the

history and progress of the club from its origin down to the present time.

Mr. CHAPMAN, who was loudly cheered, also spoke to the toast.

The CHAIRMAN: The next toast I have to propose is, "The Royal Agricultural Society of England and its President, Lord Portman; the Highland and Agricultural Society of Scotland; and the Royal Agricultural Society of Ireland." Of the first and last of these the club may be said to be the parent; but I believe the Highland Society will claim to be the first. All of them have, however, done extensive good: they have extended agricultural knowledge, and promoted agricultural improvement; they foster farmers' clubs, and it would be well that the landlords also fostered them. It is a delusion to believe that the tenants alone can improve without encouragement (*cheers*). Gentlemen, let us drink prosperity to these great societies.

The CHAIRMAN: I give the next toast with the greatest possible pleasure—it is, "Agriculture, Manufactures, and Commerce." Although we are more attached to agriculture, we are not unmindful of what is due to the others; and we always wish them prosperity. They are necessarily connected, and those who wish to disunite them are enemies to all. I am sure that it is the wish of the farmers throughout the country that agriculture, manufactures, and commerce should be united in one firm bond of union (*cheers*).

Drunk with three times three.

The CHAIRMAN: The next toast is a standing toast in all farmers' clubs—I mean, "Prosperity to the Agricultural Labourer" (*cheers*). We are bound, as landowners and occupiers, not to forget the farm labourers—an honest, industrious, and deserving body; and I am happy to say that at present they are receiving a fair day's wage. It is to our advantage that the labourer should be well employed—not only that we should pay him well, but that we should treat him with consideration and kindness. "Prosperity to the Agricultural Labourers."

Drunk with three times three.

Sir H. D. Goring and Sir H. Verney were then announced as candidates for admission into the club.

The CHAIRMAN: As the last toast I have to propose, I am sure you will give this one a hearty welcome. "Live, and let live" (*cheers*). I am delighted with the reception which you give it, and I am sure you feel and act upon it (*cheers*). Landlords should "let live" to their tenants, and tenants should "let live" to their labourers. Gentlemen, I have to express my thanks for the manner in which you have received me. The duties of Chairman are at all times important, and I have felt considerable difficulty in occupying it after so able a president as our late lamented one. I beg to return you my sincere thanks, and to propose the toast (*cheers*).

Drunk with three times three.

The noble Duke and the company then retired.

Since the last meeting the hall has been entirely redecorated, and presented on this occasion a very brilliant appearance.

THE POTATO DISEASE.

SIR,—My best thanks are due to you for your kindness in so promptly inserting my letter in the *Herald*, on the causes and prevention of the diseases of the potato. There was a trifling oversight at the commencement of that letter, which I wish to correct; it begins as if intended for the Highland Society only. It was at one time my intention to write four copies; one I had forwarded, and the others were to be laid before our national agricultural societies, and the copy I sent to you was the one I had intended for the Highland Society. Hence the mistake.

A fortnight has now elapsed since my letter was published, and no attempt has yet been made to disprove the conclusions at which I had arrived. In most of the practical suggestions respecting the crop of next year I had the pleasure to anticipate the commissioners' report; but with regard to the primary and immediate causes of the malady we are at issue. It is, doubtless, highly desirable that the nature of the causes which produce disease in the potato should be discovered, if possible; because if they are dependent on circumstances under the control of man, effectual measures may then be devised for preventing or mitigating this and other maladies which have caused so much loss and uncertainty in the cultivation of this crop of late years. Whether I am correct or not in my views as to the primary and immediate causes of the murrain, it must be evident to every unprejudiced mind acquainted with the subject, and willing to apprehend truth, that the commissioners have certainly not discovered the cause.

The principal conclusions at which I had arrived being opposed to those of Dr. Lindley, the only botanist of the commission, and this being also more of a botanical or physiological than a chemical question, I forwarded to that gentleman at Dublin a copy of the *Herald* containing my letter. But I learn by the *Gardeners' Chronicle* of the 15th and 22nd inst. that Dr. Lindley still adheres to the opinion that cold and wet, and not fungi, are the cause of the malady. He, moreover, denies the truth of Mr. Knight's theory, that plants propagated by extension do wear out. This opinion, however, is supported by a statement directly opposed, as it seems to me, to well-ascertained facts. Believing then, as I do, that the conclusions of the commissioners on this point are inconclusive and unsatisfactory, and still believing my views as to the progressive degeneracy of the plant considered as a

species are true, and that fungi are the immediate cause of the destruction, I see no other means so likely of speedily clearing away errors, and of arriving at a more truthful view of the whole case, than by stating additional facts, and by courting a more searching inquiry.

I proved in my first letter, by, I believe, most trustworthy evidence, that the potato for a long time after it was first introduced into this country was not affected by any serious disease; then from about the middle of the last century up to 1832, some varieties were affected by the curl; and then from that time to the present a more injurious disease (dry-rot) had been experienced; and now we have a disease previously unknown, and still more fatal, the murrain. I showed that the earliness of the attack and the rapidity of the destruction in these different diseases had been progressive.

In the "curl" the diseased tubers vegetated, and the young plants struggled as it were for existence; in the dry-rot sets were destroyed before they had time to vegetate; and now the living plant is attacked, and the tubers are destroyed before they have reached maturity. In the first and second stages of disease I showed that the maladies could not be accounted for without admitting that there was a predisposition to disease in certain varieties, owing mostly to the length of time they had been in cultivation, and that the causes which affected the destruction of the sets by dry-rot afforded the best possible proof of diminished vitality. The facts on which these conclusions are based do not admit of doubt; and if the conclusions I have drawn from them are erroneous, then it appears to me incumbent on those who object to them, and who deny that varieties of plants propagated by extension wear out, to show in what way I have erred, and also to give a more satisfactory explanation of these facts than I have been able to do. I could hardly believe it possible that any man at the present day would have been seriously called upon to defend this theory of the late Mr. Knight, but so it is. Dr. Lindley, in the *Gardeners' Chronicle* of the 15th instant, says:—"In reality there is no proof in any part of the vegetable kingdom that races of plants wear out. Such an opinion was entertained, indeed, by the late Mr. Knight and his views have been adopted by some physiologists. Yet there is not only no proof of their correctness, but the strongest presumption to the contrary. It

is superfluous to say that the golden pippin apple is the instance on which this theory mainly turns. It is said that it is worn out, and can be no longer cultivated." And then, after stating that healthy trees of it exist in England and elsewhere, he concludes that the wearing-out theory, therefore, falls to the ground. Dr. Lindley's opinion, in the *Gardeners' Chronicle* of September 6th, seems to me amply sufficient, without any other aid to help it up again. A correspondent had observed that all varieties of the potato were not affected alike by the murrain; and Dr. Lindley desired information as to whether new varieties were not more free from disease; "for if it should be so," he observes, "that will be a very powerful argument in favour of raising seedling potatoes to a much greater extent than has hitherto been done: *a practice upon the importance of which we have frequently insisted, without reference to the murrain.* All old varieties of those cultivated plants which are propagated by division of the stem, and not by seed, seem to become feeble as they grow old, there being in this respect some analogy between plants and animals. *Feebleness of constitution is certainly the great predisposing cause in cases of murrain, and all such maladies.*"

Many after reading this will consider, as I do, that it is almost superfluous to say another word in support of Mr. Knight's theory. In the paper on this subject in the "Philosophical Transactions" of 1795 there is no mention of the golden pippin apple; but Mr. Knight states that he had been told by the planters of Hereford that it was impossible to obtain healthy trees of some of the old varieties of apples and pears. Mr. Knight confesses that he considered this opinion to be a vulgar error, and he devised an extensive series of experiments, with the express view of proving it to be so; but he was compelled by the results to arrive at a different conclusion, and to confirm the accuracy of the planters' observations; and in addition to other facts in support of this conclusion, he says, "Of the apples mentioned and described by Parkinson the names only remain, and those since applied to other kinds, now also worn out; but many of Evelyn's are still well known, particularly the red-streak, which was raised from seed by Lord Scudamore, probably about the year 1634. We have many trees of it, but they appear to have been in a state of decay during the last 40 years. Some others mentioned by him are in a better state of vegetation, but they have all ceased to deserve the attention of the planter." Then as to the degeneracy of varieties of the potato, in a paper read before the Horticultural Society in 1833, Mr. Knight observes;—I have often witnessed the progressive decay of vigour, and the different effects of the in-

fluence of age, upon many different varieties." And again, in 1836:—"That varieties of potatoes which have been long cultivated cease to be equally productive is placed beyond the reach of controversy. I have, in several instances, tried to renovate the vigour of old and excellent nearly expended varieties by change of soil and mode of culture; but I never in any degree succeeded. Many of the sets of these varieties perished without vegetating, and all became unproductive and worthless." This is the mature opinion, after 60 years at least of experiments and observations, of the most distinguished interpreter of the laws of vegetable life this country has produced, who made more experiments on the potato, with a view to the solution of various questions, than probably any other man, and whose sole guiding motive in all these his labours of love evidently was how best he could discover and apply principles in cultivation that would tend to promote the welfare of his country and his fellow-men.

But some who are not acquainted with Mr. Knight's labours may fancy I am exaggerating. Let Dr. Lindley, then, bear witness to his great merits as an experimentalist and as a faithful observer and recorder of facts. In a brief memoir in the *Athenæum*, with the initials J. L. appended, it is said, "In all these researches the originality of the experiments was very remarkable, and the care with which the results were given was so great, that the most captious of subsequent writers have admitted the accuracy of the facts produced by Mr. Knight, however much they may have differed from him in the conclusions which they draw from them. . . . No man living, now before the world, can be said to rank with him in that particular branch of science to which his life was devoted." Yet on a question like this, the wearing out or otherwise of varieties of potatoes, which requires no refined or complicated experiments to determine, but simply the application of means known to have a beneficial influence on the health of plants, and ordinary observation, J. L. now wishes us to believe that there is not only no proof of the correctness of Mr. Knight's views in this matter, but the strongest presumption to the contrary.

A knowledge of this theory, or law of nature, which I consider it to be, is, I conceive, of importance to all who cultivate plants, and possibly it may not yet be perfectly understood or known by some. The point in dispute then may be more clearly seen generally if, before we proceed any further, the nature of Mr. Knight's theory is briefly stated. The apple and pear are two distinct *species* of fruit. There are many sorts of apples and pears, and these are called *varieties*. If apples

and pears were propagated by seeds only, then each tree would be a distinct variety; but a favourite apple or pear is propagated by cuttings or grafts, and the trees so raised are still only so many trees of one variety; they are the extension of one individual, and partake of the common life qualities and tendencies of the original tree. A variety of the pear may live 400 years, supposing two plants were raised from a tree when 200 years old, one from a seed, the other from a cutting or graft. The seedling plant may live 400 years also; but, according to Mr. Knight's theory, the plant raised from the graft or cutting would continue in a healthy state about 200 years only. The theory is, that at whatever period cuttings or grafts are taken from the original tree, or from trees raised by cuttings of it, the plants so raised will exhibit a sympathetic state of health, if we may so speak—that is, the whole will decline in vigour about the same time as the parent tree, if that died from sheer old age, making due allowance, of course, for the effect of different soils and situations; but that by no means can plants so propagated be made to live for ever. But as a cutting or graft of an old tree is itself young, some may not see why it should not grow as long and continue as healthy as another plant recently raised from seed, and the objection has been made; but they forget the existence and influence of the vital principle, on the energy and power of which the health and vigour of a plant or animal mainly depends. It is the diminution of the vitality of the young shoot from an old tree, as compared with the seedling plant, which makes all the difference.

In order, however, that there may no longer be any loop-hole or room for the most sceptical to doubt, other observations than Mr. Knight's must be cited. I have mentioned above that observing practical men were the first to conclude that varieties of apples and pears wear out; and in the case of potatoes I find a letter dated December, 1794, by Mr. Bartley, in the Bath papers, the year before Mr. Knight's letter was read before the Royal Society, in which it is said "a notion prevails in Lancashire and some other potato counties, that after a certain period the cuttings or off-sets are apt to degenerate in quality, as well as in power of producing abundant crops; whereas it is thought that potatoes raised from seed continue to improve in both respects for a considerable number of years." More decisive proof of the truth of Mr. Knight's theory may be found in the *Quarterly Journal of Agriculture*, for March, 1837. Mr. Gorrie, of Annal-gardens, says—"That old age may have overtaken many of the varieties of the potato long since cultivated in this country, is proved by such varieties having disappeared.

About the commencement of the present century a flat white potato was in general field-culture, and possessing qualities not equalled by its successor in this country, the Perthshire red. The flat white potato in the last year of its culture, became sickly and in early soils very liable to curl." In 1806, Mr. Gorrie received a few tubers of the Perthshire red, which for many years continued free from disease; then for a few years curl was manifested; "ultimately, rot appeared in the seed tubers of this and other long cultivated varieties, and every method of pampering their decayed constitution was and is resorted to. Heating in pits is recommended to be avoided; but in days of yore, heating in masses in close houses did not affect their health. Planting without allowing the seed-tubers to come in contact with unfermented dung has been resorted to; but erewhile this was reckoned wholesome practice. Planting when the soil is moderately moist is tried; but new and vigorous varieties succeed though planted when the soil is dry, whether newly cut or cut a month before planting, whether the dung be fresh or fermented, whether the tuber has been moderately or well ripened, or whether they may have been preserved in pits in the ordinary way, or preserved with greater care. In fine, to use the language of Mr. Simpson, of Killeen, Ireland 'as to the potato degenerating, there can be no doubt of it.'"

There is, indeed, no room to doubt; I am so satisfied of this from my own limited experience, than I believe it is not more certain that two and two make four than that varieties of potatoes do wear out. Varieties of the favourite flower, the ranunculus, are propagated like the potato, by means of tubers; and they obviously decline in vigour also when cultivated. Mr. Lynburn writes, "Having had a good deal of practice in raising and seeing raised flowers from seed, especially the ranunculus, I have invariably found that those most recently from the seed had so much more vigorous growth, both in the foliage and the flower, that it has become customary for florists to point them out in each other's flower-beds from their appearance."* Dr. Horner, in an article on this flower, says:—"The friendly caution is given to the young florist not to purchase any of the older varieties of the ranunculus, with the exception of about a dozen sorts—the self-coloured ones. They are uncertain, poor, and meagre in the extreme, when compared with the splendid varieties more recently raised."† Mr. Tyso observes—"Last year was the most congenial to the ranunculus I ever recollect. Indeed, so prosperous

* Highland Society's Transactions, 1837, p. 506.

† Gardeners' Chronicle, June 25, 1844.

was it, that many of the old varieties produced seed." This gentleman has been an ardent cultivator of this flower forty years, and has raised hundreds of seedlings; and he observes—"Some of the finest seedlings are weak, and therefore die in a few years, though for a short time they had great renown. The names of several such are mentioned. But there are others of first-rate character which are remarkably strong, and increase abundantly."* And so it is with other plants. There is a difference in the constitution of different varieties; but sooner or later they all decline in vigour, become unfit for the purposes of the cultivator, and are superseded by newer and more healthy varieties.

The artisans of Lancashire and Nottingham find amusement for their leisure hours by cultivating varieties of the gooseberry for premiums; and they find, when varieties have been cultivated some time, the weight of the fruit diminishes.

Having now given what I think will be considered sufficient proof that varieties of plants propagated by extension do gradually wear out, and having shown in my former letter that the potato plant, considered as a species, has been gradually becoming less hardy and more liable to serious and fatal diseases, my object now will be to offer some proof that the deterioration is a consequence of not continuing the species by a succession of vigorous seedlings from the most healthy and hardy varieties only, and before they had shown any symptoms of declining vigour. It is not absolutely requisite that I should be able to prove this. The plant, as a species, has degenerated. And this explanation of the cause must be considered the true one, unless it can be successfully refuted, or a better found. There are, however, some observations on record which support the conclusions I have arrived at on this point also. In the first place, it may be well to show that even varieties of plants annually raised from seed may become more hardy and vigorous by a judicious selection of seed-bearing plants, and deteriorate in consequence of not attending to this. The hint, moreover, is of great value and of universal application, and I fear is not yet sufficiently understood or acted upon by many. In the *Gardener's Magazine* for May, 1838, is an article by a person who had visited Mr. Knight's garden, and who observes—"In the *brassica* tribe Mr. Knight has procured an exceedingly hardy variety of cabbage, and of a purple sprouting broccoli, by selecting, for a series of years, those plants for seed that suffered least from severe weather. He believes the sort sold by seedsmen under the name of

Knight's cabbage, although originally true, to be much inferior to his own; that of the seedsmen having greatly degenerated, owing to want of care or skill in selecting seed-bearing plants, whilst Mr. Knight's had yearly improved through attention to that particular." If varieties of plants annually raised from seed, and not propagated by extension, thus become less hardy by not sowing seeds from the strongest plants only, we may be very well assured that degeneracy will be much more certain when, in addition to any original difference in the constitution of different varieties of the potato, there is superadded the feebleness or disease consequent on old age.

In a report of the Board of Agriculture on the potato, published about 50 years ago, a Mr. Holt says—"The Manly and pink-eye are both delicious potatoes and of excellent quality, but were so affected with the curl some years ago as to be totally given up till renewed again from seed; they are at present in great estimation. One ounce of seed may produce a hundred varieties, and not two worth cultivating; but a similar plant may be produced from the parent stock." Here is one proof at least that seeds were saved from varieties known to be not only delicate, but diseased. In the report on dry-rot to the Highland Society, in 1837, Mr. Bishop observes—"Those who recollect the strong and vigorous stems, perfect flowers, and abundant crop of seed-plums which the red potato exhibited for a number of years after its first introduction to Perthshire, compared with the puny slippery stems and abortive organization of flowers now visible in that variety, must be convinced that it is much deteriorated, and that it is only by procuring new and valuable varieties from seed that the productiveness of the potato can be ensured and restored to its former worth." It is then said, "Mr. Bishop had himself made the experiment on this variety, and some of the seedlings had done well." Here is another instance where seedlings were raised from a variety where it had manifested unequivocal symptoms of declining vigour, and this will have been the case mostly. It is natural that a man should wish to perpetuate the old favourite varieties if possible, or to obtain others like them; and no means would seem so likely to effect this, to a man unconscious of any evil results likely to follow, as by saving seed from the old varieties themselves. Need we wonder, then, at the present lamentable state of this crop, or be any longer in doubt as to what is the primary cause of those different and progressively fatal diseases? Every man acquainted with the laws of vegetable or animal life will be persuaded in his own mind that so sure as night will follow day, so sure will successive generations of plants, if raised from seeds

* *Gardeners' Chronicle*, June 22, 1844.

of feeble or old parents, become progressively less hardy, and more susceptible of disease. Some practical men, I know, may be found who labour under such an obliquity of mental vision that they cannot see that varieties wear out; the old age of some, they say, could not be the cause of the sets perishing by dry-rot, because some varieties recently raised from seed perished likewise. The average duration of a variety of the potato was supposed by Dr. Dickson to be about 15 years, and one man finds a variety which has been in cultivation a much longer period than that, and still comparatively healthy, and he, too, concludes that there is no truth in the doctrine that varieties wear out, and that the old age of some could not be the cause of the sets perishing. But what should we say of a man who, knowing that three-score years and ten was the limit assigned to mankind, beyond which there shall be sorrow, should find a hale old man who had seen five-score years, and, overlooking the generations which had passed away, should fix his attention solely upon him, and conclude that there was no limit to the earthly existence of man, and that with due care he would never die? Other practical men, however, view these matters in a very different light. Mr. Stirling, of Kenmure, for instance, at a discussion on the cause of dry-rot, at a meeting of the Highland Society, stated that the new varieties recently raised from seed were decaying, but he concluded that it was a natural consequence of the degenerate state of the parents; and he further observed that "under these circumstances he saw no alternative but to get a fresh supply of seed, and the sooner the better, from its native country. Unless something were done," he added, "the potato might degenerate altogether." This was the almost prophetic warning of a highly intelligent practical man, in 1844, and addressed to a body of practical men, and before there was anything said or much known in this country of the murrain. Must there not have been something very unusual in the potato crop of late years, then, to justify such a remark as this? Many of the northern farmers, I find, are of opinion that the degeneracy of the plant is the cause of this malady as well as all previous ones. One or two extracts may be of use:—"Many agriculturists assert that the potato has been gradually degenerating for the last ten years, and that within the last three or four the rapidity of the decline has

been very perceptible."* "Many different opinions are prevailing as to the nature and cause of this disease, but it seems to some very glaringly to be the same dreadful epidemic that lately raged in spring—the same visitor, only come at another season. In consequence of the frequency of the disease in spring, the potatoes have become so much weakened, that now, as soon as ripe, the disease appears, as it has been observed; in late situations it is longer in making its appearance than in early soils and situations. The vitality of the potato seems lost; and this useful esculent will, it is the opinion of many, soon be unknown in our isle."†

A Mid-Lothian farmer writes thus—"The true value of the practical farmer's dictum, 'the rain has done it all,' is apparent when we reflect that, while the present season in North America has been dry and warm, the ravages of this pest have been as formidable there as here. On my own farm the disease first showed itself in the driest land. We have had quite as wet seasons as the present. Several varieties raised from seed three years ago are not free. It is now quite evident that the potato is hereditarily diseased."‡

And still there is not only no proof of the correctness of Mr. Knight's theory, but the strongest presumption to the contrary! The opinion of the 6th September, believe me was the true one:—"Varieties of plants propagated by stems, and not by seeds, do wear out. Feebleness of constitution is certainly the great predisposing cause in cases of murrain, and all such maladies."

With your kind permission, I must trouble you with some further remarks on the immediate cause of the present malady, whether it is caused by fungi, or wet and cold, or any other atmospheric influence.

I am, Sir, your most obedient servant,

JOHN TOWNLEY.

* Berwick Warder, Nov. 1.

† Edinburgh Weekly Register, Nov. 12.

‡ Scotsman, Nov. 12.

THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A monthly Council was held at the Society's house in Hanover-square on Wednesday, the 3rd of December; present, the Right Hon. Lord Portman, President, in the chair; his Grace the Duke of Richmond; T. R. Barker, Esq.; S. Bennett, Esq.; W. R. Browne, Esq.; F. Burke, Esq.; F. C. Cherry, Esq.; W. A. Cherry, Esq.; J. W. Childers, Esq., M.P.; H. Gibbs, Esq.; B. T. B. Gibbs, Esq.; C. Hillyard, Esq.; W. Fisher Hobbs, Esq.; J. Kinder, Esq.; J. Parkins, Esq.; F. Pym, Esq.; Prof. Sewell; J. V. Shelley, Esq.; W. Shaw, Esq.; Prof. Solly; C. H. Turner, Esq.; T. Turner, Esq.; and H. Wilson, Esq.

Finances.—Mr. Raymond Barker, Chairman of the Finance Committee, laid before the Council the monthly statement of the accounts of the Society, when it appeared that the amount of invested capital stood at 8,200*l.*, and the current cash balance in the hands of the bankers at 242*l.* The Chairman also laid before the Council a balance-sheet made up to that day of the Shrewsbury meeting account, shewing the total receipts (including the subscription of 1,000*l.* from the town of Shrewsbury) as amounting to 3,661*l.* 12*s.* 2*d.*, and the total payments to 5,166*l.* 8*s.* 9*d.*, leaving an excess of payments over receipts on that account of 1,504*l.* 16*s.* 7*d.* chargeable on the general funds of the Society. The Chairman stated, that as there were still, however, a few unsettled accounts connected with the Shrewsbury meeting, the balance-sheet then presented was incomplete accordingly, and not finally closed. Mr. Barker also presented, on the part of the House Committee, their monthly report of proceedings, which, along with that of the Finance Committee, was adopted by the Council.

Prize Essay.—Mr. Pusey, M.P., Chairman of the Journal Committee, reported to the Council the award of the Society's Prize of 20*l.* for the best Essay on Catch-meadows, to Mr. John Roals, of Brendon Farm, Wiveliscombe, Somersetshire.

Selected Wheat.—Earl Spencer transmitted to the Council his detailed Report on the Comparative Trial of the Cultivation of the Wheat selected at the Southampton Meeting, along with other varieties grown in the neighbourhood of Northampton. The consideration of this report was deferred until the other reports on this subject have been received.

December Meeting.—The President reported that Dr. Lyon Playfair had kindly consented to deliver two lectures on the Potato Disease, before the members, on the occasion of their ensuing General Meeting, at nine o'clock in each of the evenings of Wednesday, the 10th, and Thursday, the 11th inst. The President further reported, that the Royal Institution of Great Britain had liberally granted the use of their Theatre, in Albemarle Street, Piccadilly, for the delivery of these lectures; the members of the Society obtaining as formerly their free

tickets of admission on application to the Secretary, at 12, Hanover-square. A Report from Mr. Pusey, M.P., Chairman of the Journal Committee, was then read, stating, that as Dr. Lyon Playfair had acceded to the President's request to deliver lectures to the Society on the Potato Disease, the communications from members on that subject had been transferred to him for examination. The Council ordered the Rooms of the Society in Hanover-square to be thrown open for the accommodation of members from six to ten o'clock on the evenings of Wednesday, Thursday, and Friday next: the General Meeting being held on Saturday, the 13th inst., at eleven o'clock in the forenoon.

Committees.—The Council then proceeded agreeably with the bye-laws to re-appoint the Standing Committees for the ensuing year, adding the names of Mr. Pym and Mr. Jonas to the list of the Finance Committee, and those of the late and present Mayor of Newcastle-on-Tyne to that of the General Newcastle Committee.

Annual Prize-sheet.—On the motion of Mr. Raymond Barker, seconded by Mr. Gibbs, it was resolved, "That in future the Prize-sheet for the country meeting should be finally settled at a Special Council to be held on the Thursday of the Smithfield Club week in December, instead of at one held as formerly in the month of June, in the year preceding."

Auctioneer and Engineer.—On the motion of Mr. Gibbs, the following resolutions were agreed to:—

1. That the auctioneer or his clerk shall be in attendance in an office in the show-yard from 10 o'clock, A.M., until 4 o'clock, P.M., on the Thursday of the show-week, for the purpose of receiving instructions from such exhibitors as may have properly entered stock or implements for sale at the auction.
2. That the auctioneer shall receive all the forfeit money for the withdrawal of stock or implements from the auction, and give the exhibitor the necessary countersigned order for the removal of such stock or implements from the yard.
3. That the auctioneer shall take charge of, and sell the catalogues of the sale, and that he shall deliver over to the director for the Society's use the money arising from the forfeits and the sale catalogues.
4. That the consulting engineer shall not act as one of the judges of implements, but only act as mechanical referee in case the judges may deem it necessary to call in his aid.
5. That the consulting engineer shall be in attendance in the yard, and during the trials, to examine the implements.

Northumberland Prizes.—The President read to the Council a letter addressed to him by the Duke of Northumberland, in which His Grace expressed his

approval of the proposed arrangement by the Council for the distribution of the premiums which he had placed at their disposal.

The President laid before the Council numerous communications he had received for the Journal Committee on the Potato disease, and other subjects; and the Council ordered that a collector of subscriptions on the part of the Society should be directed to attend, as usual, at the office of the Smithfield Club, for the convenience of those members who visited the Show during the ensuing week; the appointment of an auctioneer for the Country Meeting of next year being referred to the General Newcastle Committee.

Implement Prizes.—His Grace the Duke of Richmond, at the request of the President, then took the chair, and the Council proceeded to a consideration of the distribution of the 300*l.* voted in June last for implement prizes at the Newcastle Meeting. On the motion of Mr. Shelley, the following schedule was unanimously agreed to:—

For the plough best adapted to heavy land ..	£10
For the plough best adapted to light land..	10
For the best drill for general purposes, which shall possess the most approved method of distributing compost or other manures in a moist or dry state, quantity being especially considered. N.B. —Other qualities being equal, the preference will be given to the drill which may be best adapted to cover the manure with soil before the seed is deposited	15
For the best turnip-drill on the flat, which shall possess the most approved method of distributing compost or other manures in a moist or dry state, quantity being especially considered. N.B. —Other qualities being equal, the preference will be given to the drill which may be best adapted to cover the manure with soil before the seed is deposited	10
For the best turnip-drill on the ridge, which shall possess the most approved method of distributing compost or other manures in a moist or dry state, quantity being especially considered. N.B. —Other qualities being equal, the preference will be given to the drill which may be best adapted to cover the manure with soil before the seed is deposited	10
For the best scarifier	10
For the best chaff-cutter	10
For the best machine for making draining-tiles or pipes for agricultural purposes. Specimens of the tiles or pipes to be shown in the yard; the price at which they have been sold to be taken into consideration, and proof of the working of the machine to be given to the satisfaction of the judges	20
For the best harrow	5
For the best drill-presser depositing manure and seed	10
For the best churn	5
For the best weighing machine for live cattle and farm produce generally	10
For the best steaming apparatus for roots	5
For the best skim or paring plough	5

For the best subsoil pulverizer	£10
For the best horse-seed dibbler	15
For the best hand-seed dibbler	5
For the best linseed crusher	5
For the best one-horse cart	5
For the best thrashing-machine	25
For the best and most economical set of tools and instruments for draining purposes	10
For the best steam-power, applicable to thrashing, or other agricultural purposes	25
For the best horse-power ditto ditto	25
Miscellaneous awards	40

The Council ordered that it should be distinctly stated, among the regulations of the implement prize-sheet, that each exhibitor shall be bound to execute all orders given to him in the show-yard at the price stated in his certificate.

List of Members.—On the motion of Mr. Fisher Hobbs, the Council ordered that the list of members of the Society should be printed immediately after Christmas.

Notices of Motion: Financial Returns.—Mr. Humphrey Gibbs gave notice that he should move at the next monthly Council—

“That the Finance Committee shall in future cause to be prepared a monthly account of the state of the Society’s finances, showing on the Dr. side, first, the ordinary payments that have been made, such as rent, taxes, salaries, printing of Journal, prizes annually given, expenses of the annual show, &c.; and secondly, the amount of ordinary debts that may remain due from the Society. Thirdly, the extraordinary payments that have been made, such as the repairs of the house, purchase of printed books, furniture, &c.; and fourthly, the amount of extraordinary debts that may remain due from the Society. On the Cr. side, first the amount of arrears received of annual subscriptions for each previous year respectively. Secondly, the amount of annual subscriptions for the current year. Thirdly, the sums received for the sale of the Journal, money taken at the annual shows, and other ordinary sources of income. Fourthly, as extraordinary receipts, the amount of such compositions as may have been received in lieu of the annual subscriptions; and fifthly, any other monies that may have been received and cannot be considered as ordinary sources of income.

“That the Finance Committee shall cause to be laid before the Council as ordinary debts due at the same periods, a detailed account of the arrears due to the Society for the annual subscriptions, showing the amounts due from each year respectively, and also the amount of the annual subscription due for the current year; also, as extraordinary debts due to the Society, an account of the amounts due for compositions.

“Also a statement of the funded property, together with a memorandum of the amount of monies received as compositions, but which has not yet been funded.

“That the report above alluded to shall be for the month previous to the one at the meeting in which the statement is to be made; for instance, the account to be laid before the Council at its meeting in January next

shall comprehend the month beginning the first Wednesday in November, and ending the first Wednesday in December, so as to give the Committee full time to collect and digest the materials for the report."

The Council then adjourned to Wednesday, the 10th of December.

A weekly Council was held at the Society's House in Hanover-square, on Wednesday, the 10th Dec., present the Right Hon. Lord Portman, President, in the Chair; T. Raymond Barker, Esq.; S. Bennett, Esq.; W. A. Browne, Esq.; F. Burke, Esq.; Dr. Calvert; F. C. Cherry, Esq.; J. W. Childers, Esq., M.P.; J. Bell Crompton, Esq.; W. Fisher Hobbs, Esq.; W. H. Hyett, Esq.; S. Jonas, Esq.; J. Kinder, Esq.; G. Kimberley, Esq.; W. Miles, Esq., M.P.; R. Milward, Esq.; P. Pusey, Esq., M.P.; Professor Sewell; W. Shaw, Esq.; C. Stokes, Esq.; H. S. Thompson, Esq.; G. Turner, Esq.; T. Turner, Esq.; J. L. Wright Esq.; J. Wood, Esq.; and T. Twced, Esq.

Mr. Woodward, of Little Comberton, transmitted to the Council a memorial from the city of Worcester, soliciting the Society to hold its Country Meeting of 1847 at that place; and the various plans and points of information required by the regulations of the Council being at the same time duly forwarded, the whole of these papers were referred to the monthly Council in April.

Earl Spencer and Mr. Miles, M.P., submitted to the Council the various specimens of results obtained in making the trial of the Southampton and other wheats as judges selected for that purpose. Mr. Lister Maw presented specimens of the Belgian carrot, grown on his farm at Tetley, along with a statement of the circumstances under which they were cultivated. Mr. Canthbert Johnson suggested, in a letter to the President, a minute chemical examination into the cause of the failure of the clover crop on certain soils, where formerly that crop was grown with perfect success by their present cultivators. The committee on the analyses of the ashes of plants, were requested by the Council to favour them with a report on the actual state of that investigation. Mr. W. Turner submitted various papers and models to the inspection of the Council. The Council then adjourned over the Christmas recess to the first Wednesday in February.

A SPECIAL COUNCIL was held on Friday, the 12th of December. Present: the Right Hon. Lord Portman, President, in the chair: T. Raymond Barker, Esq.; H. Blanchard, Esq.; W. A. Browne, Esq.; F. Burke, Esq.; J. Bell Compton, Esq.; G. Kimberley, Esq.; R. Milward, Esq.; J. Morton, Esq.; J. A. Ransome, Esq.; Professor Sewell; and W. B. Wingate, Esq. The Council took into consideration and unanimously agreed to their Report to the General Meeting.

GENERAL MEETING.

The half-yearly meeting of the Society took place on Saturday, at eleven o'clock, at the Society's House, Hanover-square. There were present, Lord Portman, President of the Society, in the Chair; the Duke of

Richmond; Raymond Barker, Esq., Chairman of the Finance Committee; French Burke, Esq.; W. F. Hobbs, Esq.; Clarke Hildyard, Esq.; Professor Sewell; R. W. Baker, Esq.; Rev. Blair Warren; W. Shaw, Esq.; Allen Ransome, Esq.; T. Umbers, Esq.; S. Druce, Esq., &c., &c., Members of the Council; Mr. Hudson, the Secretary, and a considerable number of members.

LORD PORTMAN said that the first duty they had to perform was to have the Report of the Council read by the Secretary.

MR. HUDSON, the Secretary, then read the following report:—

REPORT.

The Council have to report to the Members at their present General Meeting the result of their consideration on the three following principal subjects during the past half-year, namely:—

1. The Annual Country Meetings;
2. The Finances of the Society; and
3. The Potato Disease.

ANNUAL COUNTRY MEETINGS.

The following comparative statement of the entries of stock and implements at each of the Country Meetings already held, and of the amount of receipts and expenditure on each occasion, will furnish, at a single view, the requisite data for estimating the extent of the several meetings, and their respective charge on the general funds of the Society:—

	ENTRIES.		Receipts.	Expenditure.	Excess of Expenditure.
	Stock.	Implements.			
	£	£	£	£	£
1839, Oxford	249	23	2394	2688	294
1840, Cambridge ..	352	36	3416	3589	173
1841, Liverpool ..	319	312	4106	5052	946
1842, Bristol	510	455	4202	4775	573
1843, Derby	730	508	3390	5090	1700
1844, Southampton	575	948	4929	5736	807
1845, Shrewsbury .	437	942	3662	5166	1504

It will be seen by this statement that the last Country Meeting of the Society, held at Shrewsbury, exceeded the first Meeting, held at Oxford, by double the entries of stock, and more than forty times the entries of implements; while the expenses required at the Shrewsbury Meeting, to provide the increased amount of accommodation, have been only double those of the Oxford Meeting. But the number of persons who visited the Show-yard at Shrewsbury being, from local causes, much less than at Oxford, a heavy excess of expenditure over the receipts at the Shrewsbury Meeting has become chargeable on the funds of the Society. If however, the multitudes who had thronged the former Country Meetings, in localities more accessible and more thickly populated than that of the North Wales District of the Society, in which Shrewsbury is situate, were wanting at the Society's recent Country Meeting in that town, the Council feel that a great principle of the Society has been carried out, in having held one of their Country Meetings in a district purely agricultural,

remote from opportunities of direct information as to means of improvement, of personal inspection of the various breeds of stock, and of the peculiar character of the implements of distant districts. While, however, the assemblage that formed the Shrewsbury Meeting was less than on previous occasions, it comprised within its numbers a large proportion of the most eminent agriculturists from every part of the kingdom, including distinguished foreign visitors, and a deputation from the Duchy of Mecklenburg-Schwerin: the splendid exhibition of Hereford cattle, and the quality of the show generally, both of stock and implements, constituted an exhibition fully equal in merit and intrinsic excellence to the more numerous attended meetings of previous years. The trial of Implements, both at Shrewsbury, and subsequently at Pusey in Berkshire, has proved highly satisfactory to the Stewards and Judges of that department, who have, however, reported to the Council that the trial made on the spot, and at the time of the Meeting at Shrewsbury, was fully adequate to the purpose, and might have spared the delay, expense, and trouble occasioned by a subsequent trial. In acknowledgment of the obligations which the Society owed to the Mayor and Corporation of Shrewsbury; to Mr. Isaac Taylor, of Monkmoor; to Mr. Pusey, M.P.; to the Railway Companies, and to the Commissioners of Police, the Council have transmitted to those parties respectively a vote of their best thanks.

The Council have appointed Committees for taking into consideration the following questions respectively referred to them:—

1. For recommending the best method of providing for the personal accommodation of the Judges, and for regulating the future rate of remuneration for their services.

2. For reporting to the Council the most suitable rotation of districts, to commence in 1848, for the Annual Country Meetings of the Society, to be adopted on the termination of the present schedule which ends in 1847; and—

3. For ascertaining, in conjunction with the legal advisers of the Society, the security to be provided in future against alleged infringement of patent rights, in making use of implements selected by the Judges for trial.

The Cattle Prize Sheet for the Newcastle meeting, as arranged in the month of June last according to the bye-law, in which an increase is made in the amount of the principal prizes, has been already published; the list of prizes to be offered for implements at Newcastle has also been arranged. The Council are gratified to find, from the numerous applications received from various parts of the kingdom, soliciting the Society to hold its country meeting in each of their respective districts, that the effects resulting from the system of a succession of districts adopted by the Council have not only proved to be of a most practical and beneficial character, but that they are duly estimated by the country at large. For the accommodation of the exhibitors, they have decided on further arrangements to be made with the auctioneer at the sale of stock; and in order to enable the consulting-

engineer to have increased facilities for drawing up his report on the exhibition and trial of implements, they have released him from the duties of acting as a judge, for the purpose of allowing him to devote his attention more exclusively to a detailed examination of the principles, construction, and practical working of the implements exhibited.

The Council have received from the Judges appointed for the trial of wheat selected at the Southampton Meeting, their respective reports on its cultivation, along with other local varieties, which will appear at length in the ensuing part of the Journal now on the eve of publication.

The Committee having reported to the Council that unexpected difficulties had arisen in effecting the analyses of the ashes of plants, for which the Council had voted a sum of money, the Council have requested the Committee to ascertain the actual state of the investigation, and favour them with a report on the subject.

FINANCES.

The following statement of the amount of members, income, and expenditure, from the year of the Oxford meeting to that of the Southampton meeting inclusively, will show the corresponding relation of each of these particular heads of enquiry during the period of the Society's past history:—

	Members.	Income.	Expenditure.
1838	} 2,172	£7,446	£6,941
1839			
1840	4,262	5,001	4,040
1841	5,382	6,028	5,150
1842	6,500	6,236	5,699
1843	6,903	7,907	6,906
1844	6,827	9,291	9,070

The arrears of subscription at the present time are as follows:—

	£
1841	336
1842	636
1843	1,141
1844	1,702
1845	2,987

Total.. £6,802

The total number of members in arrear is 2,902.

£1,915 having been discharged from the arrear account since the last general meeting in May. Since that date 264 new members have been elected, 42 have died, and 316 been struck off the List; and the Society now consists of the following members:—

Life Governors	94
Annual Governors	200
Life Members	527
Annual Members ..	6,003
Honorary Members	15

Total.. 6,839

The Council having ordered the list of the Society to be printed for the use of the members, it is now in the press, and will appear with the ensuing part of the

Journal. The members of the Society who receive the List and Journal would render effective service to the Society, if they would inform the secretary of any errors in the List.

POTATO DISEASE.

His Grace the Duke of Northumberland, one of the vice-presidents of the Society, having placed at the disposal of the Society the sum of £100, to be appropriated to such purpose for promoting the objects of the Society as the Council might decide; the Council, with the Duke of Northumberland's entire concurrence and approval, have resolved to divide this donation into three prizes to be offered for the best essays on the potato disease and its history, such essays to be sent in to the secretary of the Society by the 1st of June, 1846. The prize essays being reserved for announcement and reading at the Newcastle meeting, namely:—

Prize of £50 for the best essay on the remedy for the potato disease, and on its treatment in the various stages of its planting, growth, and preservation.

Competitors for this prize will be required to furnish information under the following heads:—

1. An account of the growth of the potato during the last year, with reference to the nature of the season.
2. The nature and cause of the disease.
3. The remedies for the disease; explaining the principles on which the remedy is founded.
4. The treatment of the potato in planting, both from the tubers and from the seed, and in various stages of its growth.
5. The mode of pitting and preserving potatoes in ordinary seasons, with the principles upon which any improved plans may be founded.

Prize of £20 for the second-best essay on the same subject.

Prize of £30 for the best history of the disease at the present time affecting the potato; involving a condensed detail of facts developed by experiments.

Competitors for this prize will be required to furnish information on the following points:—

1. The history of the disease in the potato in Great Britain, with particular reference to authentic returns regarding any peculiarity of season or seasonal variations.
2. On the methods for retarding the progress of the disease.
3. On the methods proposed for extracting the nutritive ingredients of diseased potatoes.

Dr. Lyon Playfair, the Consulting-Chemist to the Society, having kindly consented to deliver two Lectures on the Potato Disease before the Members, on the occasion of their present general meeting, the Council, at the suggestion of the Journal Committee, directed all papers on that subject to be submitted to Dr. Playfair's inspection previously to their future consideration by that Committee; and the Royal Institution of Great Britain having liberally placed their Theatre at the disposal of the Council, for the delivery of these Lectures, the President, in the name of the Council, and on

behalf of the Society, has expressed to Dr. Lyon Playfair his best thanks for the important practical Lectures delivered to the Members on that occasion; and to the Managers of the Royal Institution of Great Britain his best thanks for the favour they have shown to the Society, by the courtesy and liberality of the grant of their Theatre, and their cordial co-operation in thus aiding the Society in the prosecution of its objects of public utility.

The Journal Committee, since the last General Meeting, have reported the following awards of Prizes for Essays:—

Mr. O. O. Roberts, of Bangor, North Wales; Lord Kenyon's Prize of £20, for the best Essay on Gorse as the food of Cattle, Horses, and Sheep.

Mr. John Roals, of Brendon Farm, Wiveliscombe, Somerset; the Society's Prize of £20, for the best Essay on Catch-Meadows.

The House Committee have reported the execution of the various alterations and repairs required in the Society's House; the progress of the plans for the arrangement of the specimens of wheat, and of the models and implements presented to the Society; and the completion of alphabetical and classed catalogues of the books in the library.

A vacancy having occurred in the list of the Trustees of the Society, by the lamented death of John Charles Earl Spencer, the Council, in unanimously electing Frederick Earl Spencer to fill that office, have availed themselves of that opportunity of recording on their minutes an expression of their sincere regret at his loss, and their deep sense of his private virtues, and of the valuable services he had so uniformly and unweariedly rendered to the Society in promoting every practical object connected with its welfare, and the general advancement of agricultural improvement. They have elected Mr. Grey, of Dilston, a Member of the Council, in the vacancy caused by the transfer of Frederick Earl Spencer to the list of Trustees.

The Council beg, in conclusion, to congratulate the members on the steady progress of the society in the advancement of its various objects; and on the distinct evidences, throughout the country, of the impulse given to the national cause of agricultural improvement by its movements. They are more and more convinced, as their labours proceed, that, in every attempt to establish sound principles of practical agriculture, the indispensable necessity exists of combining the application of abstract reasonings with a careful collection of facts, aided by that discussion of the rich store of practical experiment to which every member of the society, from within the sphere of his own local observation, has it in his power more or less to contribute, and especially at the weekly Councils, which will be held as usual, during the session of the Society, from February to August.

By order of the Council,

JAMES HUDSON,

Secretary.

London, Dec. 12, 1845.

The Rev. Mr. WARREN proposed that the report which had been read should be adopted. It gave a

most gratifying account of the position of the Society; and it was particularly satisfactory to know that they were increasing in numbers, that their funds were also increasing, and that, with the exception of last year, the expenditure was decreasing. That gave them every encouragement to proceed. And as there could be no doubt that the institution was an excellent and useful one, they should persevere in their exertions to support it. He begged leave to propose that the report be received and adopted.

Mr. UMBERS had much pleasure in seconding the motion. It would be a source of pleasure to the country at large to know that the Society was so flourishing, and especially to the agricultural community.

Lord PORTMAN said all the members would hear with pleasure that the Society was progressing; but they required means to forward its usefulness. Every member should endeavour to induce his neighbour to join the Society, and avail themselves of every possible opportunity to bring the Society, and the good that it is capable of doing, before every farmer in the country, and thereby increase the number of its members, and of course its usefulness. Since the last meeting a great number had joined its ranks, and he was sorry to say that since then they had also suffered a serious loss. He could not put the question to them without expressing his deep grief for the loss they had sustained by the lamented decease of Lord Spencer. Individually it was a great loss to him (Lord Portman), as it deprived him of the valuable assistance of such a colleague; and although he was still assisted by the experience and ability of the noble duke (Richmond) on his right, he should have much wished that he had the deceased nobleman on his left. He hoped, however, that the removal of his lamented friend was a blessing to himself, although it was an irreparable loss to him (Lord Portman) and the Society.

The question was then put and carried unanimously.

Mr. RAYMOND BARKER said, that as Chairman of the Finance Committee, it was his duty to inform the meeting that the auditors had met on the previous day, and the accounts for the preceding six months had been submitted to them. The statement of accounts was then read, from which it appeared that the total receipts during the first half of the present year (including the Christmas balance) had been 7,086*l.* 18*s.* 11*d.*, and the total expenditure during that period (including the purchase of 500*l.* stock) 3,169*l.* 18*s.* 2*d.*, leaving a current cash balance of 3,917*l.* 0*s.* 9*d.* He also read to the meeting the Balance Sheet of the Shrewsbury meeting, showing the receipts on that account (including the subscription of 1,000*l.* from the town of Shrewsbury) to have been 3,661*l.* 12*s.* 2*d.*, and the payments up to that date 5,166*l.* 8*s.* 9*d.*, leaving an excess of expenditure over the receipts on that occasion of 1,504*l.* 16*s.* 7*d.*, which had been already paid out of the general funds of the Society, in addition to the amount of Prizes awarded at the Shrewsbury meeting.

Mr. BARKER continued.—Those accounts had been submitted to the auditors, and Mr. Blanchard and the noble lord in the chair could vouch for their correctness;

the books were before them, and every information was given to test their accuracy. He could not refrain from making some observations with respect to the large amount of arrears due to the Society. Much had been done to diminish that amount, and he was glad to say that they had succeeded in doing so to the extent of nearly 2,000*l.* One great cause of the large amount of arrears was, that many members in the different districts in which the Society had held its annual shows, had joined the Society for the year in which the show was to take place in their own locality, and they did not consider that being once members they were bound to continue their subscriptions. At Cambridge, for instance, they had a very large additional number of members—gentlemen connected with the University, who were present at the Pavilion dinner, many of whom had never intended to remain permanent paying members of the Society. Another cause was, that application for payment was not promptly made, otherwise it would have been ascertained that those gentlemen did not intend to continue members, and then their names would have been struck off the books of the Society, and the amount of their subscription would no longer be put down to swell the amount of the arrears. The same observation would apply to Liverpool and Bristol, and the subscriptions were not forwarded. When, however, application was made, as the answers came in they disclosed the real state of the case, and the names were struck off. Some of them paid, and others had delayed to do so. During that and the last year a very different system was pursued, and it was gratifying to know that the amount of arrears due for the year preceding January, 1845, was greatly less than for any previous year; and on the current year the number was still less in proportion. The Shrewsbury meeting had added to the deficit, but that was not a very material point.

Mr. BLANCHARD said, that from the statement of the Chairman of the Finance Committee, it appeared that a larger revenue was returned than was actually received, and that was occasioned by parties entering themselves as members who did not intend to continue so permanently; but now that the error was discovered it would not occur again, and he (Mr. B.) trusted the explanation given was satisfactory to the meeting.

Lord PORTMAN said that one paragraph of the report recommended that it should be inserted in the next Journal that information should be given of any error in the list of members; but it should be borne in mind that no member in arrears received the Journal, and that, consequently, the insertion of the paragraph would not have the desired effect; and he (Lord P.) therefore thought the members should endeavour to ascertain the requisite information in their various localities, and transmit it to the Secretary.

The Duke of RICHMOND said that he rose to propose that the thanks of the meeting should be offered to the gentlemen who acted as Judges at the Shrewsbury meeting (*hear, hear*); and he hoped they would permit him to express his concurrence in the report of the Council. He was satisfied that the Society had done great good, and that it was capable of doing much more.

It had been stated by some that they were expending too much money on the country shows, and that the district in which the show was held should pay all the expenses. Now he differed from those who said so; and he was sure that there was no more legitimate or beneficial manner in which they could expend their funds. (*Hear, hear.*) If they were to confine their shows and their operations to one locality they would do very little good to the tenant farmer, who could not be present; but by shifting their ground, the tenant farmer could attend the meetings, and go into the Show Yard. He (the Noble Duke) considered that there was no more legitimate manner of spending their money. It was true that the expenditure at Shrewsbury was great, but that was principally owing to the want of railway accommodation; they were obliged to employ omnibus proprietors to convey the persons attending the show thirty miles to and from the railway, and that necessarily occasioned a heavy additional expense; and the want of railways also kept a great number of persons from attending the show. He thought, therefore, that the money was well spent. The object of the Society was to diffuse information, and he hoped that the members would not be so foolish as to sacrifice the usefulness of the institution on account of any additional expenditure. (*Cheers.*) He trusted they would excuse him for making these remarks; and he begged to propose a vote of thanks to the Judges of the Shrewsbury show. His Grace further said that he hoped they would pardon him for leaving the meeting, as he had the command of Prince Albert to attend him at the Cattle Yard, where the Prince was to call that morning. (*Cheers.*)

Mr. HOBBS seconded the motion, and said that he entirely agreed with what had fallen from the Noble Duke.

The question was then put, and carried.

Mr. BROWN proposed the thanks of the Society to Professor Playfair, for his able and instructive lectures on the "potato disease," and he recommended that the Professor's opinions should be printed and circulated in a cheap pamphlet, for the benefit of the working classes.

Mr. FRENCH BURKE seconded the motion.

Lord PORTMAN said, the suggestions of the Professor were exceedingly valuable, and would be found most useful for the poor.

The motion was then carried.

Mr. H. RANSOME proposed a vote of thanks to the Royal Institution of Great Britain for the use of the theatre on that occasion.

Professor SEWELL seconded the motion, which was carried unanimously.

Mr. DIVETT, M.P., impressed on the meeting the necessity of farmers keeping correct accounts, and urged the consideration of the Society to the subject. He also called their attention to the desirableness of holding one of the annual shows at an early period in Exeter, where it would be productive of great good.

Lord PORTMAN said, that it was a question whether the wise men of the East should go to the wise men of the West first, or that the West should go to the East (*laughter*).

Mr. WARRENE called the attention of the Society to the importance of preserving fluid manures.

Lord PORTMAN said that Mr. Warrene was irregular, as the subject was before the meeting.

On the motion of Mr. PUSEY, the auditors were re-elected.

On the motion of Mr. DIVETT, the thanks of the meeting were voted to the Chairman for his conduct in the chair, and the meeting adjourned.

NEW MEMBERS.

Allen, James, Holt Farm, Pilton, Shepton-Mallet, Somerset
 Anderson, Joseph, Whitley, Tynemouth, Northumberland
 Anderson, William, jun., Newcastle on Tyne
 Bagot, Hon. William, Blithfield, Rugely, Staffordshire
 Batard, Thos. Matthias Bearda, Sydenham, Kent
 Bell, Thomas, Newcastle on Tyne
 Bell, Christopher Seymour, Cumberland Road, Newcastle on Tyne
 Bennet, Philip, jun., M.P., Rougham Hall, Bury St. Edmunds
 Brown, Rev. R.G.S., Vicar of Atwick, Hornsa, Yorkshire
 Bull, Humphrey, Aston-Clinton, Tring, Herts
 Carr, William Cochrane, Blagdon, Newcastle on Tyne
 Carr, John, Roseworth, Newcastle on Tyne
 Carrol, Hutchinson, Tulla House, Nenagh, Co., Tipperary
 Cookson, Isaac, Meldon Park, Morpeth, Northumberland
 Cornwall, Sir Velters, Bart., Moccas Court, Hereford
 Colton, Michael George, The Terrace, White Hart Lane, Tottenham
 Cowen, Joseph, Blagdon Burn, Newcastle on Tyne
 Creswell, A. J. Baker, M.P., Creswell, Morpeth, Northumb.
 Drummond, Dr., 103, Gloucester-place, Portman-square
 Dyke, Henry, Papade, Monmouth
 Dyke, J. D., Glovers, Sittingbourne, Kent
 Elgar, James, Wingham, Kent
 Fox, Robert, The Lodge, Wendover, Bucks
 Greenhow, John, Kendal, Westmoreland
 Headlam, Thomas Emmerson, Mayor of Newcastle on Tyne
 Hearn, John Henry, Newport, Isle of Wight
 Henderson, Edward, Lowick, Wooller, Northumberland
 Howard, John, Breerton Hall, Sandbach, Cheshire
 Howard, Hon. James, Hazely, Newbury, Berks
 Huchison, John, Monray, Peterhead, N.B.
 James, Thomas, Brandon, Wooller, Northumberland
 Laycock, Robert, Wenlaton, Newcastle on Tyne
 Laycock, Richard, Wenlaton, Newcastle on Tyne
 Majendic, Ashhurst, F.R.S., Heddingham Castle, Halstead, Essex
 Marshall, John, Alnham, Whittingham, Alnwick, Northumb.
 Martinson, Edward, Hedgefield, Newcastle on Tyne
 Mason, Thomas, Fallinsburn Cottage, Ford, Wooller, North.
 Merest, Charles William, The Priory, Forham, Bury St. Edmunds
 Milne, Oswald, jun., Prestwick Wood, Manchester
 Naish, W. B., Stone-Aston, Bath
 Parker, Rev. William, Rector of Little Comberton, Pershore, Worcestershire
 Parker, Harrington, Parbold Hall, Standish, Wigan, Lanc.
 Phillott, Edward Pender, The Clewards, Dawlish, Devon
 Pope, Thomas, Kidbrook, Blackheath, Kent
 Potter, Addison Langborn, late Mayor of Newcastle on Tyne
 Potts, Timothy, Rising Sun, Long Benton, Newcastle on Tyne
 Pulleine, James, Crakehall, Bealac, Yorkshire
 Rathbone, Basil, Woodcroft, Liverpool
 Reed, Nicholas Ridley, Byrness, Redesdale, Jedburgh, N.B.

Rees, Rees Edward, Packingsh, Newport, Moumouthshire
 Spoor, Richard, Whitburn, Smderland, Durham
 Stagg, Thomas, Great Bedwin, Wiltshire
 Stent, Bridger, Hastings, Sussex
 Swaine, Thomas, Buckingham
 Thorp, Thomas, Alnwick, Northumberland
 Twining, F., Parbold Hall, Standish

Vere, John, Carlton on Trent, Newark, Notts.
 Walker, George, Eastwood, Nottingham
 Watts, James, Hythe, Kent
 Wells, John, Woodborough, Nottingham
 West, Captain, R.N., Jesmoud, Newcastle on Tyne
 Wickham, John, Butcombe, Bruton, Somerset
 Wilkinson, William, Stainton Vale, Richmond, Yorkshire.

INORGANIC CONSTITUENTS OF PLANTS.

BY JOHN TOWERS.

It is always dangerous to attempt to prove too much. Since Liebig published his estimable organic chemistry, it has become a sort of passion to ascribe every thing—so far as refers to nutriment derived by roots from the soil—to the *inorganic* matters which it supplies to the sap.

A great many facts, one of which I shall shortly recite, have proved that the earth is the medium whence plants derive their silex, lime, metallic oxides, and salts with mineral bases: but what proof is there that organic gases are not furnished? and can any one get rid of the irrefragable truth, that, just as *bulk* of food is indispensable to the animal digestive organs, so bulk of decomposable manures is of the last importance to the health and luxuriant growth of every vegetable?

Of the importance and universal distribution of inorganic substances throughout nature, it would not, however, be difficult to furnish decisive proof, and of this the following experiment may be taken in evidence.

Every one is acquainted with the simple process of burning weeds in field and garden; but few reflect upon the conditions which it involves, so apt are we to pass by the common occurrences of life, though they include phenomena of stupendous grandeur. Last October I burned the refuse of the garden, in order to bring its active principles within the smallest compass: the heap included raspberry canes, lettuce stalks that had borne seed, cabbage and broccoli stems, and weeds, as they came to hand. A small parcel of the best and cleanest of the ashes was taken; and for the sake of chemical investigation, I submitted three portions of from 30 to 60 grains to a series of tests (not sufficiently comprehensive doubtless) but which furnished the following results:—

The ashes were first heated in pure water in a flask for an hour or more, and the liquid was strained through filtering paper: evaporated to dryness, two grains of salts were obtained from every 20 grains of the ashes; and these salts yielded *muriatic* acid in abundance to nitrate of silver, some (but not so much) *sulphuric* acid to nitrate of baryta, and platina

chloride of *potassium* to perchloride of platina. The fluid also showed an alkaline reaction to turmeric paper; and thus we have ample evidence of the presence of chloride of sodium, sulphate of soda or potassa, and of some free potassa, in the soluble salts obtainable by lixiviation of these ashes. The insoluble ash remaining in the filter, being dried, and treated with diluted hydrochloric acid, boiled, filtrated and washed, till free from taste, lost 11 grains of 40, and the 29 remaining were fused at a red heat with about one drachm of carbonate of potassa, by which process they lost 9 grains more. The first filtrated *muriatic* solution yielded to caustic ammonia a copious precipitate of *oxide of iron* , but no phosphate. After filtration and washing, the liquid which passed was tested by oxalate of ammonia, and deposited much *oxalate of lime* . The portion fused with potassa was treated with hydrochloric acid, and then with water; and by being passed to a filter, washed, dried, and weighed, above 16 grains of pure silica were obtained, and the clear filtrate yielded a most copious deposit of *Prussian-blue* to the test of prussiate of potash, also one grain of *alumina* to caustic ammonia. These results, which were essentially "qualitative," were, nevertheless, established by a collateral analysis with *nitric acid* to the extent of about *three grains* , and this deficiency arose chiefly by an accident.

The experiment in itself is specifically worthless, because it determines no one definite point: still it leads to the general inference that salts of great consequence exist in all vegetable matter, and become revealed by combustion; therefore, that any man or body of men who can demonstrate the components of each individual farm or garden plant, and prove by accurate tests the constituents of the soil *prior to cropping* , and its definite loss or change after a given crop, must and will be esteemed a benefactor to the country.

It belongs to our colleges of agriculture and of chemistry to carry out, and faithfully report similar experiments and results; and if they succeed, agriculture and the sister art, will be exalted in character, by being established upon a base of philosophic truth.

REVIEWS.

A TREATISE ON SHEEP; by Ambrose Blacklock, London (*Groombridge and Sons, Paternoster Row*).—To recommend a useful work to the attention of those for whom it is written ought to be the duty of the editor of any periodical; but where that periodical is confined to a particular class of readers, as is the case with us, and when that class require every assistance that research and science can give to enable them to keep their ground with these changing times, we take it to be an admitted truth that it is doubly our duty to select only such works for approval as upon the face of them bear out their own testimony. The farmer of the present day finds the most difficult branch of his business to be the profitable management of live stock. Disease for these last seven years has assumed a more formidable appearance amongst cattle than hitherto; indeed, so much so, as to induce some well minded and spirited individuals, amongst whom are to be found as patrons the names of His Grace the Duke of Richmond, Lord Torrington, Lord Abercrombie, Lord Kenyon, and the Hon. Wm. Gage, to associate themselves into a mutual insurance society, called the "Farmers' and Graziers' Mutual Cattle Association," for the purpose of protecting the farmer by insurance of cattle, as he was hitherto enabled to do by insurance against fire. Yet, as the general treatment of cattle for profit is as necessary to know, as it is prudent by insurance to protect them from total loss, the perusal and study of "Blacklock's Treatise on Sheep," which only embraces points of importance, and rejects those which cannot admit of practical application, will be to the farmer of the first advantage. This work omits all allusion to foreign varieties of sheep, thereby stripping away superfluous matter, and laying only before the reader what directly concerns himself, viz., those belonging to this country. He treats on the improvements of their breed in a business-like manner, quite intelligible to the plainest understanding; the remarks on their profitable management—though a difficult business—is naturally arranged and classified: the clearest and most concise terms are used in the direction for operations, and the means are pointed out which art affords for the remedy of accidents to which they are sometimes liable; and the clearness with which he treats of their diseases, which are illustrated by engravings, both coloured and plain, make it a work of reference, not only for the well educated farmer, but also those who practise

sheep management without previous training. The whole is wound up with an interesting account, and remarks on the management, of sheep in Australia.

THE SPORTING MAGAZINE, from September to December (*M. A. Pitman, Warwick Square*).—This useful and amusing work continues to be conducted on that same principle which has so long procured for it the attention and patronage of sportsmen. In illustration and literary matter we find the editor still keeps his team "well coupled up together;" Harry Hie-over, as usual, taking about the most prominent place amongst them. In all concerning the chase, the experience of this gentleman is well applied. Though, as we recommend Harry Hie-over for a guide across country, we take some other of the many good correspondents of this magazine as authority on the more intricate business of riding, training, and running the race-horse.

THE SPORTING REVIEW, from September to December (*J. Rogerson, Norfolk-street, Strand*).—The high ability with which Nimrod and Craven, by long odds the first men in their line, set the Sporting Review on its legs, has, within the last year or so, rather increased than diminished the excellence of its form and action. Grave and gay, home and foreign intelligence, now bring it out with an effect that nothing but the very best hands in the market being regularly on it could hope of realizing. The illustration department of the Sporting Review, more particularly, we have no hesitation in saying, is scarcely equalled by any publication of the present day; and the letter press, we can add as surely, is rounded off with a true knowledge and elegance of expression (in most cases), that many more presuming periodicals might well take a copy from.

THE VETERINARIAN, from September to December (*Longmans, Paternoster-row*).—There are few professions—not one, indeed—that have advanced so much of late years as the veterinary art; and not a little of this improvement, we are inclined to think, is due to the periodical which so ably records its transactions and diffuses its successes. The four numbers we have now before us are quite up to its established worth in every individual paper, and as capitally combined as usual by the able and well-known editors, Messrs. Youatt and Percivall. The continued article on rheumatic lameness in the horse, by the latter of these gentlemen; an extraordinary idea, well worked out, on the practicability of using horses without shoes, by

Mr. Mogford, of Jersey; and some observations on inflammatory fever in cattle, by Mr. Barlow, are amongst the many other clearly expounded contributions which have caught our attention. The cases, anecdotes, and suggestions from members of the profession generally, are as abundant and useful as the matter furnished to this department has always been remarkable for.

THE DOMESTICATED ANIMALS OF THE BRITISH ISLANDS; by Professor Low (*Longman, Brown, Green, and Longmans*).—"In the rural economy of this country, a high degree of importance is to be ascribed to a knowledge of the distinctive characters of races or breeds. Much of the profits of the owners depends upon adapting the breed of any animal to the circumstances in which it is to be placed." So says Professor Low in the preface to the present edition of his very able and comprehensive work, and so we beg leave most cordially to echo. The observation as to the benefit derivable might indeed, we think, be made almost equally applicable to any country, though in none are these said circumstances so carefully or profitably attended to as in our own. The Arab may mess with his horse, the Brahmin worship his bull, the Spaniard boast of his sheep, or the Esquimaux his dog, while the Englishman could compete with all four, and with every chance of success, mainly from that greater spirit of enterprise and improvement which a high state of civilization so rarely fails to produce. The domesticated animals of the British Islands are then, in fact, one of the greatest triumphs we have, and to which nearly all the rest of the world are wont to look for breeds of standard excellence. Any book, consequently, of so very general a nature as professing to include the whole of them and their varieties, must be supported by an immense amount of not only personal experience and thorough acquaintance with each individual subject, but also of hard study in collating the opinions of others, to secure it that high standing amongst publications of its class we may naturally expect it aspires to. This work, though, as we have already stated, does not come before us in an entirely new form; a much larger and more expensive edition in two volumes, by the same hand, on the same subjects, having for many years established itself; subsequent alterations and improvements, together with a desire for cheapness and condensation, alone requiring it to be rewritten. An addition, moreover, we should say, is very properly made in the article on the Dog; and the single volume now contains the history and the description of six distinct animals, with every known variety ever introduced into this country. These are the goat, the sheep, the ox, the hog, the

horse, and the dog, preceded by a very elaborate introduction on the divisions of the animal kingdom, and an anatomical consideration of external form; in all, eight hundred and eighty pages of matter, which, it is about the greatest recommendation to say, as we very safely can, comprises the cream of the Professor's original work. If there be anything to cavil at, it is the paucity and poorness of the engravings—a point in which the first edition has a superiority that we should hardly have expected, from the subsequent advance in wood-engraving. Perhaps, however, any equal improvement in this line would have been incompatible with the cheap character the book now assumes.

The extract we give will show that in *all* the British islands the improvement in, and the method of managing some of the so-by-custom called domesticated animals, are not exactly in accordance with that national civilization on which we have just been complimenting ourselves. It is an exception, however, that we transfer to our pages more from its very singularity than anything else. "The sheep, over a great part of these islands (the Orkneys) are pastured in common; and the general treatment of them is rude in a remarkable degree. The animals are often left entirely to their own resources in the bleak and desolate islands in which they are imprisoned. They are collected by being hunted together, once a year, stripped of their fleeces, marked by their respective owners, and then turned adrift, until such as survive are caught again in the following year, and subjected to the same treatment. In all cases the number of rams is allowed to be disproportioned to that of the ewes; and in many cases the number of sexes are nearly equal. When sheep are wanted from the pastures, they are run down by dogs; and hence these poor creatures acquire as great a terror for the dog as in other countries they do for the wolf, or other beasts of prey. The dogs, termed Had or sleep dogs, are taught to select a particular sheep, and run him down; and curious old laws existed regarding the property and control of these animals. Under the whole of this barbarous system, the mortality is excessive; all the property to be derived from a proper management of a flock of sheep is lost; and all the means are foregone of improving the breed, by the selection of the male and female parents."

The Duke of Richmond has been unanimously elected President of the Smithfield Club. By this appointment his Grace will have filled the high office of President of the four most leading societies in Great Britain connected with Agriculture.

METEOROLOGICAL DIARY.

BAROMETER.			THERMOMETER.			WIND AND STATE.		ATMOSPHERE.			
Day.	8 a.m.	10p.m.	Min.	Max.	10p.m.	Direction.	Force.	8 a.m.	2 p. m.	10 p. m.	
Nov.	22	29.60	29.68	35	45	34	N. West.	gentle	cloudy	sun	fine
	23	29.81	29.98	31	41	32	N. by West	gentle	fine	sun	fine
	24	30.00	30.11	30	40	32	N. by East	br., gen.	fine	sun	cloudy
	25	30.02	29.98	32	46	38	S. West	gentle	cloudy	cloudy	fine
	26	29.84	29.84	38	52	51	S. West	strong	cloudy	cloudy	cloudy
	27	29.98	29.88	48	52	48	W., S. West	lively	cloudy	cloudy	cloudy
	28	29.69	29.57	46	51	50	W., S. West	strong	cloudy	cloudy	cloudy
	29	29.73	29.70	41	50	40	S. E., N. East	brisk	cloudy	cloudy	cloudy
	30	29.85	29.95	35	46	39	N. W., S. W.	brisk	fine	sun	fine
	Dec.	1	29.95	29.97	39	47	40	W. by South	brisk	fine	sun	cloudy
2		29.96	29.64	40	47	42	W. by South	brisk	fine	sun	cloudy
3		29.47	29.54	34	44	33	West	brisk	fine	cloudy	fine
4		29.70	29.50	31	43	43	W. by N., S. W.	gentle	fine	sun	cloudy
5		29.48	29.50	42	48	38	W. to W. by N.	brisk	fine	sun	fine
6		29.50	29.48	33	46	33	S. W., South	gentle	fine	sun	fine
7		29.63	29.96	31	42	32	N. by West	gentle	fine	sun	fine
8		30.10	30.00	26	45	45	S. by East	var. calm	fine	sun	cloudy
9		30.10	30.17	40	47	37	N. West	gentle	fine	sun	fine
10		30.28	30.28	34	43	35	N. N. E., N. W.	gentle	fine	sun	cloudy
11	29.97	30.00	35	50	39	N. Northerly	v. strong	fine	sun	cloudy	
12	30.20	30.38	33	40	32	N., N. by W.	gentle	fine	sun	fine	
13	30.41	30.40	28	36	33	N., N. by W.	lively	cloudy	sun	fine	
14	30.33	30.01	32	45	45	West	lively	cloudy	cloudy	cloudy	
15	29.77	29.80	38	50	40	W. by N., W.	lively	cloudy	cloudy	cloudy	
16	29.80	29.80	40	48	46	W. by North	brisk	cloudy	cloudy	cloudy	
17	29.50	29.63	42	45	42	various, S. E.	gentle	haze	cloudy	cloudy	
18	29.80	29.60	40	46	39	S. E. to N. E.	brisk	haze	cloudy	cloudy	
19	29.35	28.98	33	45	35	S. W., W. by N.	variable	cloudy	cloudy	fine	
20	28.81	29.00	34	41	35	N. West	brisk	cloudy	cloudy	fine	

ESTIMATED AVERAGES OF DECEMBER.

Barometer.		Thermometer.		
High.	Low.	High.	Low.	Mean.
30.320	29.120	55	17	39.3

Real Average Temperature of the period.

High.	Low.	Mean.
45.55	36	40.775

North and N. East Winds.. 3½ days.
 East and to South..... 7½
 South and South West..... 10¼
 West and to North 10

WEATHER AND PHENOMENA.—November 22, cold, tending to frost. 23, fine frosty day. 24, fine day, changeable evening. 25, much rain early; clear damp evening. 26, much rain in the past night; high wind. 27, pleasant, tranquil, and warm day. 28, same, though quite overcast. 29, much rain from before noon. 30, beautiful and drying day. Sixteen days in November wherein it has rained more or less; very little frost at any time, none through-

out an entire day. December 1, rain in the night, and again early, but fine mid-day. 2, fine forenoon; windy, wet evening. 3, fine early and late; day changeable, with sleet; aurora borealis in the north. 4, fine day; wet evening, 5 lively, cool day. 6, frost rime remains on shady spots. 7, clear, with frosty air. 8, thaw after white frost; compound clouds and rain at night. 9, another fine change; high state of barometer established. 10, very fine day;

variable at night; and the same throughout the 11th, with strong wind. 12, frosty air. 13, strong rime; the coldest day. 14, a decided change, and the end of the fine sunny days. 15, broken clouds; no sun, but pleasant. 16, the same. 17, foggy; drizzling rain. 18 hazy; exceedingly wet. 19, sleet showers, and furious gusts; ground soaked. 20, brisk showers, otherwise improved; wind keen; and evening fine.

The chief phenomena are found in the singular and beautiful line or arch formed by all the visible planets; the whole autumn has been thus enriched. Rain on eleven days.

LUNATIONS. Nov. 22, last quarter, 4h. 26m. morning. 29th, new moon, 11h. 41m. forenoon. Dec. first quarter, 6th day, 2h. 52m. morning; full moon, 13th day, 6h. 43m. evening.

REMARKS REFERRING TO AGRICULTURE.—The weather has been favourable to the plough—in Berkshire at least—and everything is looking well: more we cannot report. The wheat is healthy and green, for the few frosts we have had have been sufficient to check luxuriance, and a mild winter, as a whole, is propitious, and offers a good prognostic.

Maidenhead Thicket,

J. TOWERS.

CALENDAR OF HORTICULTURE—JANUARY.

We defer our retrospective remarks to the latest period at command, and therefore postpone them till the end of this article. With the new year we propose to commence our observations in those departments in which activity must prevail, since it is also evident that all external work must be contingent. Another motive also offers itself, because on the very day when the manuscript of the present calendar was commenced, a casual call at a neighbouring nursery presented to view a furnace for the propulsion of hot water through forcing houses, that promises to effect all the objects for which we have upon several occasions contended. It had just come to hand; therefore another opportunity must be embraced to describe the mode in which it will be set up, and the arrangement of the hot water channels, so as to obtain regular bottom heat in a propagation tank, and a temperate or warm atmosphere equally throughout the whole house. Suffice it to say, that the boiler is the *furnace*, which, from its structure, is called “the saddle boiler;” that the fire acts horizontally, as in the common brick oven-furnace, reposing upon bars, and prepared to burn any kind of fuel, of the cheapest description, with a slow or rapid draught, leaving nothing whatever unconsumed, save the merest incombustible ashes, that fuel of every description must ultimately yield. After these preliminary remarks, we commence with

THE FORCING DEPARTMENT.

Early Vinery.—Many persons begin forcing the vine with the new year; but as grapes require at least five months to become properly ripe, the first vine ought to be now green, and the temperature raised by day to 68°, and by night to 58—60°. If the fire is not yet lighted, the house should be warmed

by degrees, beginning at 50, and increasing moisture in proportion to the advance of temperature. They who argue for vapour, and the condition of the bagnio, direct to wash the stems of the trees, to syringe till the branches drip with water, and the floors become flooded. Others there are who repudiate moisture and steam. The red spider may be kept down by steam, and sometimes by sulphur; but there are houses in which it never has infested the vines. Every one must act according to his own object. If large fruit be aimed at, rigid thinning and very great moisture will be required; but if richness of flavour be sought, judicious thinning, and high temperature by day, with little moisture at any time, must be adopted.

The fruiting pine-stove must be kept regularly at 70 to 75°, and much higher with sun and air; the succession pits pretty warm, moist, and with little air; nothing can support a close vaporous atmosphere better than the growing pine; and the steam of fermenting stable manure, moving through lined flues, as in M'Phael's pits, is most congenial.

The earth for pines is an open, silky loam-turf, with no artificial manure; the inorganic constituents of the pine ought, in fact, to be correctly determined, and perhaps it may be found, that *bone earth*, or super-phosphate of lime, will be useful—we must make this a matter of research.

The peach-pit and house must be excited with great caution, for the least excess of fire in the blooming season will cause the loss of the germs of all the varieties, unless we may except the Royal George and Noblesse. 40 to 48° by fire may be the limits, and air is of great consequence.

FLOWER HOUSE.

The water and tank system answers perfectly, and, with the furnace just described, ought to supersede every mode of warming flower houses, because of the sweet genial temperature and the perfect cleanness of foliage which are maintained. Even in the dark winter months of 1844-5 it was interesting to behold the beautiful floral specimens that were produced in January and February, and the immense number of lovely flowers devoted to form the bouquets of fashion, all produced by hot water forcing. The only defects are in the tanks, where it should seem that nothing can supersede tan, leaves, or manure, as the plunging medium. Heat, radiated merely through a substance, like sand, &c., that has none in itself, cannot produce the same results as that which is developed within the mass of substances in a state of chemical decomposition.

Keep up 55 to 60° in flower and propagation houses, and 40 to 45° in the geranium and succulent departments. The hard wooded tribes will generally do well in pits, sunk and protected, with free air and little, if any, heat.

In frames, and with gentle hot-beds, radishes, lettuce, a few carrots, and saladings are raised; and so may be the cabbage tribes that have suffered by intense frost. Such accidents occur now and then, but frame-culture finds a remedy. Here, too, we recommend the oiled screens, formerly described, to be secured by fillets; straw mats, also, properly woven, become a most effectual defence.

Hot beds for cucumbers and melons may be forwarded; but the safest of all erections are the fluid brick pits, heated all round by masses of dung and leaves placed between it and four walls that form the facings to spaces excavated for the purpose. In aid of the linings, a small hot water apparatus is very advantageous.

Potatoes will be in requisition very early; and it is probable that many persons who never thought of a potato raised by artificial heat, will have recourse to fluid pits or vacant spaces in vineries and elsewhere, to produce an early supply. The plan appears very feasible, especially as a trifling degree of heat will stimulate the tubers.

Sow kidney beans in the hot-house, and introduce to gentle heat a few pots of Keene's strawberry.

VEGETABLE GARDEN.

First week, sow peas of any early kind: Mazagan and long-pod beans; a fair crop of each, three or four inches deep.

In the last week, sow second early peas, Dutch and Cilicia lettuce, and radish seed.

Protect early-sown crops by litter, also celery

rows by boards or lines of bean-stalks placed closely on each side.

A new mode of hardening asparagus, and rendering it highly prolific, has been suggested. Instead of throwing earth out of the alleys or intermediate spaces between single rows, and therewith covering the plants, we are told to fork off the soil from the plants, partially exposing the crowns, and, as spring approaches, to dig the alleys, making the earth fine, and throwing it over the crowns to a full depth. The trench thus formed on each side is to be filled with good manure. We would try a portion, for it is quite certain that asparagus is perfectly hardy; and, again, that manure applied at the season of growth is in its proper place, and more likely to stimulate and feed the plants than when it lies inert over their crowns, or even in trenches during the season of torpidity.

To force asparagus and sea-kale, attend to former directions.

Trench and ridge open plots, remove litter, and prepare compost manures. These *ought* to be compounded for specific objects, and we shall never be gardeners in the full sense of the term until we know the elements of soils as appropriate to every individual vegetable. But to this knowledge the mind aspires; and when organic chemistry shall have discovered those constituents which are peculiar to a plant, and analytic chemistry shall have detected the presence or absence, *after crop*, of the given element, then we may feel assured that we act upon principle in preparing a compost for asparagus, for potatoes, broccoli, cabbage, and so on to the end of the catalogue. We are sure of the presence of oxygen, hydrogen, and carbon, in all vegetables and animal refuse, therefore pretty safe in as much as refers to the *organic elements*; but at present we remain subjects of conjecture only when applying manures on the general system of enrichment.

FRUIT DEPARTMENT.

Neither plant nor prune any superior tree, and continue the defences of the fig and others that have been covered. At the close, it may be well to regulate the berry-bearing shrubs; for, if the weather be open, their buds will enlarge. Begin with gooseberry-bushes, and, as a system, prefer to cut away so many of the oldest bearing branches as to leave a regular supply of the best situated shoots of last year. But some gooseberry trees produce close-set spurs the entire length of even old branches, and also have a handsome fruit-spur at the base of worthless twigs. In such a case, leave the fruitful branch, and cut back the twigs everywhere—most of them entirely away, but others to the spur at their base.

Spur boldly the currants, always excepting the black-fruited, leaving the bearing-shoots bristled from top to bottom with clustering, short spurs; then cut back all the leading young wood to an inch or two of its origin, and also retain any fine new shoot that will advantageously supply a fresh bearer.

Raspberries: cut out all the weakly canes, retaining four to six good ones; prune these to a bud below the curve, then tie the shoots to a stake, or open, against a trellis. Some gardeners confine them to a row of stakes, set in sloping from the south towards the north, at an angle of about 30 degrees from the perpendicular. In that way, the young wood of the following season will grow upright without interfering with the bearing-shoots. Keep the rows orderly by grubbing up all the rambling suckers.

As the plot of these shrubs are pruned, lightly fork the soil an inch or two to remove weeds, and dress the surface with manure. Never dig with the spade, especially among raspberries, because the roots are thereby injured.

SHRUBBERY AND ORNAMENTAL GROUND.

At the end of the month, if the weather prove open, fork and turn over the soil, burying the dead leaves; trim off supernumerary shoots and misplaced branches. If snow fall, let it be speedily shaken off the exposed evergreens, to prevent sunscalding.

Keep the edges of lawns neat; weed gravel walks; and suffer no filth to accumulate.

The flower-garden should not be disturbed at this season of the year. January is often mild and delusive, by which persons are too apt to be misled.

Retrospect: So far, we have a mild, early winter—the very contrast of December, 1844. Then, gloom, fog, and intense frost prevailed; now, we have just perceived two or three rimy frosts, have enjoyed a very fair proportion of sun, and an ample supply of penetrating rain. Vegetables have been plentiful and good, and every kind of “greens” remains rich and in excellent condition. Turnips, carrots, parsnips, and beets, were never better; and celery, though a good deal of it is small, cannot be complained of.

Of potatoes—so contradictory are reports, many of which have an interested motive—that we can offer no decided opinion. At all events, our own are, and have been, excellent, and keep well, though perhaps one-fifth part was sacrificed, having some taint. All the preservative and restorative processes recommended are just so many words wasted; bad potatoes cannot be cured, and good ones require only perfectly dry treatment, and this they ought always to enjoy. There will be no lack,

if our own vicinity be taken as a guide to an opinion; for if half a sack can be bought for 3s., or even a single bushel for 2s., in the face of all the denunciations of famine, what is to be said? Potatoes are dear in comparison, but so are bread, meat, and other requisites; yet none of these articles are so high in price as they have been within the short period of twelve years.

As to tubers for seed, we are keeping a sack or two of those which are discoloured in the rind expressly for the purpose, and have already planted seven rows. If we can keep the others safe from frost we fear not the disease, having already preserved infected tubers from September last without perceiving any deterioration.—December 20.

AGRICULTURAL QUERIES.

TO THE EDITOR OF THE FARMER'S MAGAZINE.

SIR,—“A Subscriber” wishes to get a plan of an efficient kiln for charring peat, at a moderate cost, on Mr. Smith's (of Deanston) plan.

SIR,—Having a large quantity of a mixture of road scrapings, ditch cleanings, and rubbish from old buildings, I shall feel greatly obliged if any of your correspondents will inform me of the best and cheapest mode of improving its fertilizing properties. I am, yours respectfully,

INQUIRER.

SIR,—In your magazine for September there is a very useful and ably written article, by James Anderson, Esq., “On the indications which are practical guides for judging of the fertility or barrenness of the soil.” In the above article the principal guides to an observer of the natural state of the soil are the various plants, &c., therein stated; these plants, to me, and I have no doubt to a great many others, are unknown by their proper names; I should therefore feel obliged by your informing me, in your next month's publication, whether you are aware of there being any agricultural botanical work, wherein the plants, &c., are not only described by their respective names, &c., but are shown by coloured engravings, so that the same might be easily observed and recognized by a person unacquainted with the botanical name. By informing me of the above, and the name of such work, you will confer a favour on,

Sir, your obedient servant,

Waltham Abbey, Essex.

DELTA.

[The late Mr. Loudon's, and Dr. Parnell's, are the best works on grasses. Loudon's Encyclopædia of British Plants is considered to rank the foremost of all such works,—ED. F. M.]

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR DECEMBER.

Notwithstanding we have now arrived at the close of 1845, the atmosphere during the whole of the past month has been extremely mild and vegetative. In all parts of England, as well, indeed, as throughout the United Kingdom, farm labours have progressed remarkably well, and it affords us great pleasure to be enabled to assert that the winter wheat plants are everywhere represented as looking strong and healthy, although they stand much in need of a few sharp frosts to check premature exuberance.

The events which have taken place in political circles, since the date of our last report, have been of a character calculated to arouse the energies of the agricultural body, in support of their just rights and privileges. As these events are of the highest possible interest at this moment, we shall here take a cursory glance at them, in order that our numerous readers may have an opportunity of preparing themselves for any future legislative enactments that may be passed having reference to the import of the staff of life. The decided change which has taken place in the views of Lord John Russell, his Lordship now asserting that a total free-trade is inevitable; the disunity in Sir Robert Peel's Cabinet, on the corn question; and the various changes in the ministry, have produced a degree of excitement, seldom or never, equalled. The strenuous efforts of the Anti-corn-law League—the immense amount of subscriptions obtained by that body, to carry, as they term it, “war into the enemy's camp”—appear to impress many with the belief, that the days of protection to the agriculturists are numbered. The result, therefore, has been, that great activity prevailed in our principal corn markets in the month's early part, and the quotations of wheat and all other articles of grain, from the unwillingness on the part of dealers to purchase, on, as they conceived, the eve of a repeal of the corn laws, beyond what they require for immediate use. Under those circumstances, it was but natural that the growers should forward limited supplies of wheat for sale; hence, from the 22nd till the close of the month, the demand for that article ruled steady, and prices improved from 2s. to 3s. per quarter.

Looking at these fluctuations in value, we are somewhat struck with the folly of partise anticipating extremely low prices from the publication of rumours—nothing more—respecting the fate of our import laws.

That some change in the existing laws is in contemplation, not a doubt can exist. What its exact nature may be, it would be impossible at this moment to state; still we will endeavour to reply to the question put to us by many of the leading farmers: “Will Sir Robert Peel propose a total repeal of the corn laws in the ensuing session?” We have carefully watched the progress of events for a long time past, and made the most extensive inquiries as to the stocks of wheat, and other articles of grain, in the hands of the growers: we have not failed to take into the account the partial failure of the potato crop—the stocks of foreign grain and flour in warehouse here—the supplies now on their passage hither from different parts of the world—the quantities that will be received here during the new year—and above all, the consuming powers of our population. All these lead us to the inference (we *may* be mistaken in our impressions), that ALL PROTECTION WILL NOT BE TAKEN FROM THE HOME GROWERS IN THE NEXT SESSION. Still, it is clearly evident that the produce of our colonies will be placed on the same footing as that of Canada; and we should in no way be surprised to find Sir Robert Peel proposing a *fixed duty*—say of 4s. or 5s. on wheat, and a nominal one on barley and other articles of foreign growth.

The mildness of the weather has been productive of a good supply of pasture herbage. This together with the superabundance of turnips and other food, has afforded a most plentiful supply of food for depastured and other cattle stock, which is now suffering but little, if anything, from the epidemic. This subject we have more fully enlarged upon in our “Review of the Cattle Trade,” which will be found in another column.

From Scotland, our advices are of a favourable character. The wheats above ground are described as luxuriant, though not to say winter proud: while the land is, generally speaking, in fine working order.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

In taking a review of the cattle trade during the month just concluded, we may observe that several features of somewhat peculiar interest have again presented themselves to our notice. The most important may, perhaps, be considered the importation of live stock from abroad under the new tariff. Notwithstanding the present advanced season, not less than 2,210 beasts, 3,329 sheep, 2 calves, and 89 pigs, have come to hand in the port of London direct from Rotterdam, Hamburgh, and Harlingen, in, generally speaking, good condition. At the outports, the arrivals have been good—namely, 397 beasts and 510 sheep, wholly from Holland. To show the increasing importance of this trade, we may observe that, at the corresponding period in 1844, only about 400 oxen and cows, together with about 90 sheep, were imported from the continent. Respecting the condition of the foreign beasts, we may observe that they carry a very large quantity of internal fat, but that the eatable quality of the flesh is by no means first-rate. From the exertions still making by the Dutch and German graziers to forward large additional supplies of fat stock to our markets, it is quite evident they have been obtaining a remunerative profit by their late shipments. As has been the case for some months past, immense numbers of beasts are now being fed in the principal distilleries in various parts of Holland; hence it is reasonable to suppose that every opportunity will be taken advantage of to supply our markets freely in future. The prices obtained for the foreign beasts lately arrived in the metropolis have varied from £14 to £22; the sheep, 36s. to 47s. per head. The last official returns, made up to the 5th of November, give the following as the total imports during the last three years, ending on that date:—

	1843.	1844.	1845.
Oxen and bulls - -	1,019	2,889	3,118
Cows - - - - -	348	836	4,600
Calves - - - - -	36	53	565
Sheep - - - - -	190	1,272	8,263
Lambs - - - - -	6	16	812
Swine and hogs -	319	237	656

The steadiness observed for some months past in the demand for sheep in the whole of our principal markets, but more especially in Smithfield, has formed powerful inducements for the foreigner to ship that description of stock, which has, we hear, paid remarkably well.

Owing to the superabundance of food, the stock on most of our large farms has fared extremely well, during the whole of the month; and it affords us great pleasure to state that but few cases of epidemic, or foot rot, have come under our observation.

As a matter of course, the holding of the various local cattle shows has attracted much of the attention of our agriculturists and others. As we predicted some time since, the stock brought together for competition, taking the country generally—though we confess a large number of the beasts has not come up to the weight of some former seasons—has been more even in quality than we have had to report for a series of years past. This, of course, must be chiefly attributed to the excellent green crops gathered in the course of the year. The proceedings in Smithfield having been the centre of attraction, we may observe that the supplies of beasts have exceeded those of most past years, both as respects number and quality; indeed, we never recollect to have seen a more even collection than that exhibited on the “great day.” The numbers of sheep have, however, been small, though of first-rate quality. In this particular, the supplies have never been equalled. Those during the last four years have been as under:—

DECEMBER.

	1842.	1843.	1844.	1845.
Beasts ..	14,820 ..	13,290 ..	13,290 ..	17,712
Sheep ..	129,400 ..	110,362 ..	113,290 ..	98,660
Calves ..	1,182 ..	930 ..	964 ..	862
Pigs	2,412 ..	1,260 ..	1,340 ..	2,671

The comparison of prices stands thus:—

Per 8lbs. to sink the offal.

DECEMBER.

	1842.		1843.		1844.		1845.	
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	
Beef	3 2to4	6 2	6to4	6 2	8to4	6 2	10to4	8
Mutton	3 4	4 6	2 10	4 8	2 10	4 4	3 4	5 0
Veal	3 8	4 8	3 0	4 8	3 0	4 4	4 0	5 2
Pork	2 8	4 8	2 8	4 3	2 10	4 0	3 6	5 2

The numbers of beasts shown on the great Christmas market days, in the undermentioned years, were as follows:—

Years.	Head.
1839	5,074
1840	3,528
1841	4,500
1842	4,541
1843	4,510
1844	5,713
1845	5,326

The past month's supplies of beasts have been chiefly drawn from the following districts:—

Northern counties	6,500 head.
Western and Midland.	3,900
Eastern do.	1,000
Other parts of England	2,400
Scotland	400
Ireland	900

The remainder has been derived from abroad and the neighbourhood of the Metropolis.

On the whole, the beef trade has ruled less active than on some former occasions; yet good clearances

have been effected by the salesmen at our quotations. Up to Newgate and Leadenhall markets the arrivals of slaughtered meat, from various distant parts, have been moderately good, but by no means extensive. Generally speaking, the trade has ruled steady, and prices have been well supported. Beef has sold at from 2s. 8d. to 3s. 10d.; mutton, 3s. 4d. to 4s. 8d.; veal, 4s. to 5s.; and pork, 3s. 4d. to 5s. 4d. per 8lbs., by the carcass.

The country supplies have been derived as under:—

	CARCASSES.			Pigs.
	Beasts.	Sheep.	Calves.	
Scotland.....	195	1330	—	1490
Yorkshire.....	210	1590	—	1900
Lincolnshire....	237	990	—	270
Norfolk.....	120	280	—	320
Suffolk.....	120	340	—	360
Cambridgeshire..	210	320	—	320
Essex.....	170	450	367	720
Surrey.....	280	890	310	940
Devonshire....	—	—	—	266
Wiltshire.....	215	460	264	380
Other parts....	350	750	320	700

B E R K S H I R E .

They who recollect, or can refer to, the Meteorological Diary of December, 1844, must be surprised at the remarkable difference of the weather which characterizes the present season. The whole month was dry, the frost very severe, the wind from east and north-east piercing in the extreme; Christmas-day was cold, foggy, and cheerless, to the last degree; the grass brown as the soil in which it was rooted. Now, in December instant, we count fourteen or fifteen days more or less rainy, three or four days with morning frosty rime, and many (to cite the 24th as a splendid example) whereon the sun has been brilliant as in March. This season has been most favourable to the turnip crop, to clover, to the labours of the plough, and to the early progress of wheat. The grass has been, and is, so abundant and green, that food for cattle is rich, and in every respect favourable. So far our report is most encouraging; because no time has been lost, nothing has been injured, and, if provisions are too dear, the poor labourers have not been tried and brought into jeopardy by bitter weather. It is impossible to prognosticate the future condition of the crops and of live stock; but we can assert that the rick-yards abound with plenty, and the potatoes appear to keep very well, and to fall in price. We are not by any means satisfied of the worth of this vegetable, to which we seem to attach so much importance as to raise the famine cry, because—like a crop of apples which promised to be heavy beyond wont—it happens to have been visited with an epidemic which perhaps has removed one-sixth of its entire product. The tuber of the potato yields about one-seventh of starch or arrow-root, capable of being mixed with flour as a pudding, or of being reduced to a spoon-meat, that loses its consistency in a very short time, and becomes fluid like water. It also contains a certain pro-

portion of fibre-cellular pulp, which, by adding bulk, may in some degree fill the stomach, and so far call forth its digestive powers. With a due proportion of farinaceous flour, as oatmeal, and taken with a little animal food, the potato is worthy of care and attentive cultivation; but its excellence is not paramount, nor does it claim the dole that has been bestowed upon the partial and perhaps salutary check that it has received. To recur to the subject of wheat, it should seem—in our vicinity, at least—that the plant, though healthy, is not so rank or close upon the ground as usual; and this seems to afford evidence of a more general economy of seed. It is quite certain that much seed has long been wasted; but again, experience warrants the fact that dibbled or thin-sown seed, which always tillers most freely, is later at harvest, and ripens irregularly; hence it should be in the ground some weeks earlier than broad-cast or thickly-sown seeds. It is highly probable that, were all land deeply and effectively drained by means of tiles, soles, and broken or pebble-stones, so deep as to allow fourteen inches of staple soil for the plough, such land, ploughed and finely pulverized, would yield vastly abundant crops from seeds dotted singly (or nearly so, as might be) into drills, pressed by the wheel-presser; and that in preference to sowing in holes by dibble, because of the equality of depth and firmness of bottom thus obtained. Our societies, which appear to flourish, ought to determine such facts, with all their exceptions and peculiarities, so as to leave no doubt on the subject. The husbandry of the empire is susceptible of improvement beyond conception, and it merits all the attention that the good and skilful can bestow upon it.—Dec. 25.

E A S T C U M B E R L A N D .

The time has now arrived when something like a probable estimate can be made of the result of the harvest. It is worse than useless at any time to merely guess, and that incorrectly, upon a subject of so much importance. But, at a time like the present, fraught with more than usual interest, it behoves every one to speak with care and caution, and after obtaining the best information within their reach. Before proceeding to notice the state and produce of the grain crops, &c., it may not be amiss to take a cursory review of the whole season. The months of February and March not only being favourable as to weather for the progress of farming operations, but being preceded by an unusually dry winter, accompanied by a long succession of frost, farm labour proceeded quickly, and the spring grain was got in under favourable circumstances, and the opportunity was good for getting the land intended for green crops into good order for the reception of the seed. Potatoes were got in under more than commonly favourable circumstances, and came better, with fewer complaints of dry-rot, than for several years preceding. During a considerable part of the month of May, the weather was cloudy and cold, with slight showers from the east; but the rain was never in such quantity as to saturate the land, and, consequently, the turnip crop was got favourably in, and was finished rather earlier

than usual. A considerable part of the month of June being very hot, crops of every description progressed rapidly; and although the weather became unsettled about the beginning of July, the rain that fell was never in such quantities as even to fill the ditches until the month of August; and the watering ponds in many fields were without water until that time. Consequently the summer, although cloudy and cold, attended by showery weather, could not be said to be a wet one. The hay crop, both lea and meadow, was generally well got in. There were exceptions to this; but where this was the case, it was generally in those parts where they were late in cutting; and, if the crop suffered greatly, it was owing, in a considerable degree, to the want of activity in the parties themselves; so the crop, generally speaking, might be said to be well got in. Owing to the long continued frost, the spring was not a favourable one for wheat, particularly late sown, some of which was much affected by wire-worm, was consequently late, ripened unevenly, and was defective both in quality and yield. Fortunately this was only partially the case; and the crop of wheat taken altogether will be equal, if not superior, to the crop of 1844. On the cold lands in the high-lying districts the crop of wheat will be most defective, owing to the cold weather and consequent late harvest; but this will be quite compensated for by the earlier and more favourable districts, where the wheat will yield better, and is of better quality than last year. The market is the best place to judge of the general quality; and although many inferior samples appear at market, and much of it in bad condition, yet millers have much less difficulty in getting choice samples for the finer qualities of flour than they had last year; and it is generally sound, very little of it having sprouted before being taken from the field. It was generally got in good condition; when not so, it was mostly owing to the impatience of parties causing them to hurry it in before its proper time. It cannot fail to be observed that in a late cold harvest, although attended with a considerable quantity of rain, the risk of the crop being materially injured by the weather is much less than generally supposed, owing to the low temperature, aided by winds common at that late season, preserving it from harm. Barley was, generally speaking, a full crop as to bulk on dry land; on cold late land indifferent; but as only a small portion is sown on that kind of land, it would not affect the general produce much. On suitable soils it was bulky, and yields well, and is of better quality than last year, and weighs well, some of it exceeding 56 lbs. the imperial bushel. Oats were a full average in bulk, yield well, and are fully of better quality than last year. Altogether, the stack-yards are better filled, and the produce from the flail will exceed that of 1844. Turnips are a good crop, and are now selling cheaper than at the commencement of the season, owing partly to the high price of mutton inducing the feeders to send their sheep earlier than they would otherwise have done. Potatoes came well after planting, being less affected by dry-rot than for several years back, and promised well during the principal part of the season, until the blight

affected the tops. All kinds seem to be more or less affected; but some sorts are very much more so than others. The species known by the name of Highland earlies appear worst; and altogether there will be fully a third gone; but a part of them are useful for pigs and cattle. They have been selling from 3½d. to 6d. per stone of 14lbs. Fat, both beef and mutton, has maintained its price, and appears likely to do so. Pork for curing has been in considerable demand, at from 5s. 3d. to 5s. 6d. per stone of 14lbs. The markets for leau stock are about at a close for the season, and have continued pretty good to the last. Employment for labourers has been plentiful, and those willing to work have had no need to be idle. Tile-draining is going forward to a considerable extent, quite equal to former years.—Dec. 22.

VALE OF EVESHAM.

The weather throughout the whole of the month has been extremely favourable for all farming operations. Until the 22nd inst. scarcely a flake of snow had fallen on the earth to remind us of winter: the flocks and herds are still browsing in the pastures, and all are in a healthy and thriving condition. There is a great abundance of fodder, and the barley-straw, which is very sweet and full of clover, is exceedingly relished by the store cattle and breeding ewes. The feeding sheep at turnips are doing very well, although there are a few decayed sorts amongst the Swedish turnips similarly affected to the potatoes: the crops are magnificent, and superior in quality to any we have had for many years. They should be immediately taken up, put in small heaps, and covered with a little soil, as frost would injure the larger sized ones. The young wheats are exceedingly strong and vigorous: never were they freer from slug and wire-worm. Experience has taught many the expediency of pressing, sheep-treading, and hardening the land, which is a great preventive to the ravages of these mischievous little creatures. Rye, winter oats, and barley are up, and promise abundance of early spring keep. The turnip fallows are turning up well and healthy: many are subsoiling the same, a system quite up to the spirit of the times. The plashing of hedges is proceeding: it cannot be too generally adopted, as it opens the fields to a free ventilation of air, and is advantageous in many respects. Every ditch should be scoured out: the refuse burnt into ashes makes excellent manure for drilling with Swedes. The cattle markets have been rather dull the last month. The wool market has experienced a decline, the Leeds merchants preferring to lose a fortune in scrip to gaining one by wool. The corn markets have also declined from causes too well known to the majority of our readers. Wheat has fallen about 6s. per qr., and barley 8s., and all other grain, with the exception of peas, very considerably. It is rather an enigma that, in prospect of famine, prices should recede: I trust there will be a great abundance for all, and that the dishonest knaves that have attempted to alarm and frighten the nation by evil reports will be disappointed.

SOUTH OF THE STEWARTRY.

The weather during the present week has been uncommonly wet, and sometimes boisterous. Wednesday was extremely cold; in the evening the aurora borealis was particularly brilliant and attractive; and next morning the mountains had a pretty close covering, and the lowlands, even to the salt-water's edge, a drizzling of snow. The frost had also been rather severe; but before noon the air softened, the wind went lower, there were murky clouds in the west and south-west, and by sunset it began to rain. This morning the frost and snow had disappeared; throughout the day there has been a strong wind from the west, and there are now no symptoms of settled weather. Owing to the storms, most of the farmers and graziers have commenced the foddering of outlier cattle. The sheep on turnips are doing better than was commonly expected, and very few deaths have thus far occurred. There are some reports about disease among turnips, and here and there, perhaps, rather more Swedes are rotten than ordinary. Yellow bullocks and other kinds, considering the unpropitious summer and autumn, are a pretty fair crop, and the proportion lost by rotting is not greater than usual. "There is nothing new under the sun;" but surely it is a novelty for potato starch to be exported from Kirkcudbright. Several tons have already been sent off, and in a little time large quantities will be transmitted to Liverpool, &c. Prices are recently advanced, and if the potatoes do not decay more rapidly than they have heretofore done, it is supposed that the owners of starch mills will not realize living profits. It is worthy of remark that cattle are very fond of the refuse of the potatoes. It is perfectly clean, and milch cows consume it greedily. Considerable quantities are daily scattered in the fields among young and also outlier cattle; and it is supposed to be nutritive. The potato disease is still the all-engrossing subject of conversation. Hand-picking is as necessary as it was at first; but the loss, as was formerly stated, is greatest where the tubers were housed or pitted in a damp state, when speedy heating ensued, and decomposition necessarily followed. Those who have convenient out-houses are still endeavouring to separate the apparently sound from those that are either rotten or evidently tainted; and the writer knows of several instances where, by careful waling and drying, the loss is diminishing. He has also seen some pits which contain small quantities examined; and the damage, thus far, is less than was expected; while in others, even where precautions had been used, it is greater. Here and there small breadths have been planted whole, in the hope that they will germinate next spring; but as the experiment is suspected, it is not likely to become general this winter. The writer has seen some that are planted in beds, and without any manure, lest it should superinduce mouldiness and decay; and if they sprout regularly in spring, an unusually large portion of guano will be applied. It is somewhat singular, at this season of the year, that one farmer at least, about six miles west of Kirkcudbright, has now about forty bolls of 16 bushels each

to raise. Some others finished only a few days ago. They contend that the delay was useful, because it was easier to distinguish the apparently sound from the diseased. It is still generally allowed that none of the alleged discoveries have completely arrested the progress of the taint; and when the investigations of learned men, the most of whom are but inexperienced agriculturists, have thus proved abortive, the farmers are slow to believe in the infallibility of any recipe, however highly recommended by those who are skilled in chemistry.—Dec. 5.—Dumfries Courier.

CORNWALL.

Potatoes are getting dearer, and more scarce. Many people, instead of carefully sorting out all the tubers that exhibit the least blemish when taken up, frequently put them all together in caves, without any dry sand or dry earth mixed with them; and in almost all these cases, where the disease existed at all, the whole heap is very much decayed. Some farmers, who had planted early, were alert enough, when they saw failure coming on, to get the crop taken up sooner than usual; and they who were fortunate enough to take this step, and store the potatoes before the 13th of September, with a mixture of dry earth, of which at that period there was plenty on the surface of every field, will suffer but very slightly. We are of opinion that no material is so good as very dry, powdery earth; which has been thoroughly successful in every case that has come under our notice. Some persons put as much dry earth as potatoes, and some more; and after mixing with them that proportion, and covering them all over six inches thick, they lay on a coating of the common earth that surrounds them, and thatch with reed or straw to keep off the rain. We conjure Cornish farmers to plant early, if they do not plant in autumn; the sets are then less exhausted, and sooner ready to take up.

DERBYSHIRE.

The month of December furnishes but little matter for an agricultural report, save a relation of results. Our harvest was secured, on the whole, in good order as regards condition; but the bulk of most varieties of grain was more or less damaged with the long continued rains, which fell during the first and two succeeding weeks of harvest; after that period we had fine continued weather, and the crops were gathered well seasoned. Touching the yield, we have some reason to complain. Thrashing has been very general, and the deficiency at least one fifth in comparison with last year, and the quality extremely coarse. We have now, as a proof, wheat offering in our market from five shillings to eight shillings per bushel. The young wheat plants are at present promising, and an average breadth has been sown in a tolerable tilth. The pastures are well supplied with aftermath (*eddis*), and feed extremely plentiful. The complaint as regards potatoes begins to subside; and as a proof that we are not likely to have a famine through the deficiency of bread and potatoes,

they are much more plentiful than money, and prices low. Most kinds of stock are doing well, and prices ranging high; but the farmer is very little benefited by it, for in consequence of the dryness of the summer of 1844, cattle is scarce, and they have but little to sell. Our corn markets are now political ones, and buyer and seller both afraid of being outwitted by Sir Robert. His days are numbered, if not ended, as a guide to this country; thousands of poor tenants are on the rack of poverty, as a consequence of his rash legislation. As we might naturally expect, the poor labourer is the first to feel the evil inflicted. Many farmers have discharged a portion of their men, from an incapability to pay them; and where must they retire? To the work-house. The next cry will be the farmer following in the same track, impelled by necessity; and what next? The landlord must maintain both, and himself be a poor man. We hope many will, with what little they have, help themselves as timely as they can while able. Thus ends the year 1845, full of mourning, lamentation, and woe to the farmer. What lies in the womb of futurity we know not. May He, who sits supreme, direct our legislators aright; so that every successive change may be for general good, and that as members of one great family, we may live in peace, not envying one another. —Dec. 19.

ESSEX.

The extreme mildness which has prevailed since harvest has been most suitable in affording one of the finest opportunities ever remembered for getting in the seed wheat, and in every direction we observe some of the most perfect plants we ever remember; consequently we have one of the very best prospects for the ensuing crop. Tares do not plant quite so well, the dryness of the land when they were put in being against their germination. Pastures continue to give, for time of year, good supply of food for stock yet left out; but the greater part of them are now on turnips, of which, as well as mangel, the supply is most abundant, and having been housed in most excellent condition, appears to keep well. Potatoes do better than at one time was expected, and when laid dry in barns or store-houses continue in excellent condition, and appear likely to do so. A gentleman who has a large quantity so laid by in a barn, tells us for the last month he has not found a single potato rotten, although, previous to being laid there he had sorted out full one fourth bad, and so satisfied is he the disease is stopped, he is selling for delivery next April. As regards the yield of wheat we cannot report very favourably; our opinion is that we are less by a sack per acre generally, than we were last season; but the crop of forty-four was greater by a sack than the preceding year; consequently we think we are not far out of the way in estimating it somewhere an average crop. Its condition and quality are certainly very inferior to that of last year. The yield of barley is spoken of as a full average, although its quality is inferior. Oats are certainly good in quality, but short in quantity. Beans a fair crop, but peas much under. The general operations of the farm are in an advanced stage, and the present prices we obtain for our produce are about remunerative. We are sorry to find the pleuro-pneumonia still lingers among our stock, and many continue to fall victims to that disease. Sheep continue to thrive, and little or no disease among them.

HEDGEROW TIMBER.

TO THE EDITOR OF THE CHELMSFORD CHRONICLE.

Witham, 2nd Dec., 1845.

SIR,—Now that the press of railway matter is over, I forward to you a letter which I recently received from Mr. Isaac Foster, of Great Totham, on the subject of "Hedgerow Timber." I am particularly partial to timber of all kinds, but, at the same time, Mr. Foster makes out such a strong *prima facie* case against hedgerow timber in a pecuniary point of view, and is a gentleman of so much experience, that I join in his wish that his calculations should be made public, and I would desire that they should be investigated by other practical and experienced men. For my own part, I think that Mr. Foster has set the annual improvement in the value of the timber at too low a sum.

As I believe your columns are always open for the investigation and discussion within reasonable limits of subjects affecting this locality, I make no apology for this communication.

I remain, sir, yours truly,
JACOB H. PATTISSON.

DEAR SIR,—My calculations upon growing timber in hedgerows are as under:—

	£	s.	d.
1st. The average value of timber on 100 acres of land in the county	100	0	0
2nd. Let it stand 28 years, and the improvement in value will not exceed 50s. per year	70	0	0
	170	0	0
3rd. Sell the same now	100	0	0
Interest and compound ditto	300	0	0
4th. Tenant paying 2s. more per acre, with the interest and compound ditto upon the same	377	12	0
	777	12	0
	170	0	0
	607	12	0

So that the proprietor of 1,000 acres loses more than six thousand pounds by letting it stand. Perhaps, Sir, you will have the goodness to test this by your own figures, and give it publicity for the good of the community.

I remain, dear Sir,

Your obedient humble servant,

Great Totham.

I. FOSTER.

To J. H. Pattison, Esq., Witham.

REVIEW OF THE CORN TRADE

DURING THE MONTH OF DECEMBER.

Since our last monthly article, some startling occurrences have taken place in the political world. As early as the 4th instant, the *Times* newspaper put forth the bold assertion, that the ministry had come to a determination totally to abolish the corn laws. Whether or not any such agreement was ever come to by the Peel cabinet, has not hitherto transpired; but that some great alteration was contemplated by one portion, and strangely opposed by another, seems tolerably certain, from the fact of the whole having tendered their resignation to Her Majesty. After this took place, Lord John Russell received the Royal commands to form an administration; but in consequence of the substance of his recent letter to the electors of London, wherein he pledges himself to repeal the corn laws, his former colleagues do not appear to have been willing to accept office under his leadership; and it is now settled that Sir Robert Peel is to resume power. This uncertain state of things has, it may easily be conceived, created great uneasiness amongst all classes of society; and the fear that a sweeping change will be made in the laws which regulate the importation of corn, has reduced the value of all kinds of agricultural produce materially. The Anti-Corn-law League have, unquestionably, been the primary cause of all this confusion. The exaggerated statements they have circulated of the deficiency of the last harvest, first gave rise to the clamour. The potato disease afterwards afforded them a fresh opportunity to predict famine and starvation; and so industriously did they fulfil their calling, that very general credit was given to the assertion that absolute want must prevail in Ireland, and great scarcity in England, during the winter months. Knowing how easy it is to create apprehension on a subject of such vital importance as that involved in the question, whether there was, or was not, a sufficiency of food in the kingdom for the support of its inhabitants, they put forth the most startling assertions with the utmost impudence. By these means, they succeeded in magnifying a comparatively small deficiency in the wheat harvest into something like a total failure; the potato rot was exaggerated in the same way; and uneasiness having thus been created, petitions were got up, praying of the Legislature to throw open the ports for the admission of foreign grain. The Premier, it would

seem, gave more credit to these statements of scarcity than they, in reality, deserved; and, according to common report, proposed such measures to his colleagues as they could not agree to, and resignation was the consequence.

Thus much for the past: we have now to consider the future. That a further reduction will be attempted to be made in the remnant of protection afforded to the British farmer, before the close of another session, there is too much reason to fear; and it behoves all, interested in the cultivation of the soil, to bestir themselves, and be prepared to meet the crisis. The Protection Societies have, at length, begun to take the alarm; but what has been hitherto done falls far short of what is required. Let us take a lesson from our enemies; to grapple with the Anti-Corn-law League successfully, we must imitate their perseverance and activity. Meetings should be held in all parts of the country, and the necessary steps taken to lay before the Legislature counter-petitions to those so industriously got up by the League. The county members should be called upon for a definite pledge as to the course they intend to adopt in the forthcoming struggle; so as to learn who is to be trusted, in case of a general election. Above all, let there be union and co-operation among all classes of agriculturists, and, black as is the impending cloud, the threatened calamity may yet be overcome.

Shortly after the harvest was concluded, in pursuing our usual custom, we made some remarks on the result; the outcry which has since been raised, has induced us to reconsider what we then wrote, in order to ascertain whether we had fallen into the error of over-estimating the yield. With this object in view, we have instituted the most careful inquiries; the result of which has been to lead to the conviction that, so far from having taken too favourable a view, we believe we have erred on the other side. Wheat, though certainly short of an average crop, has yielded much better in some of the southern and western counties than, from appearances at harvest time, we believed would be the case; and, allowing for the great falling-off in the produce of the north and east, still, taking the kingdom collectively, the deficiency is not important. It must also be recollected that there was a considerable stock of old wheat remaining in the hands of the growers after the new crop was

secured, and that we have at present nearly one million quarters of foreign (in wheat and flour) in bond in the kingdom. This, and the fact that owing to the lateness of the harvest the crop of 1845 will probably be required to furnish food for only eleven instead of twelve months, satisfies us that no real grounds for apprehension as to scarcity exist; and that the famine-cry has been got up altogether without foundation. At the same time we must confess, that there is not so great an abundance as to warrant us in expecting very low prices; and we look upon the recent important fall as having been brought about by the panic created by political events. Had there been no talk of an order in council, and the repeal of the corn laws, the value of wheat would, in all probability, have ranged between 60s. and 75s. per qr.; and the duty would, in the regular course of things, have receded to a sufficiently low point to encourage importations to an extent quite commensurate to our wants, without, on the one hand, pressing hard on the consumer, or debarring the farmer from obtaining a just and remunerating price for his produce.

Even under the present circumstances we question whether it is wise to press forward supplies at a period like the present, when all parties are so decidedly averse to adding to their stocks. In whichever way the corn law question may be disposed of, we feel satisfied that after it shall have been settled a better opportunity will be afforded for realizing than can be found in the present disturbed state of the market.

The decline in wheat from the highest point cannot be estimated at less than 7s. or 8s. per qr.; indeed, in some of the agricultural districts the fall has been even greater. That the reduction has in a great measure been brought about by farmers themselves there can be no doubt, and so long as they press supplies forward at a time when there is no disposition to buy, the downward movement must continue. It may, therefore, not be altogether without its uses, to consider whether it would not be better to pause for awhile and watch events.

Whoever may attempt to bring forward a measure for the total repeal of the corn laws, can scarcely expect to walk quietly over the course. We are disposed to think that recent events may, in one respect, be considered fortunate, inasmuch as they have thoroughly awoke the landed interest. There was more real danger when all appeared calm than now when the worst is known.

There are still good men and true to be found, and we by no means despair of seeing the present amount of protection continued. The threat of free trade ought not therefore to frighten farmers into sacrificing their property at an unfavourable jun-

ture; for though, as we have flatly contradicted the assertion made by the writers for the *League*, that our crops have turned out so badly as to give grounds for fears of scarcity; still, on the other hand, we are sorry to say the return of wheat has not been so abundant that growers can afford to sell at the present depreciated prices without injury to themselves.

Whilst on this subject we may as well take occasion to remark, that the rumoured probability of a free trade is by no means likely in the first instance to increase the supplies of foreign grain; simply from this reason, that our continental neighbours will, in all probability, be thereby induced to raise their pretensions, whilst the fall which prices have undergone here must check our speculators, and prevent them sending out such large orders as they otherwise might have done. The only quarter from which large arrivals can be expected to reach us before the spring or summer months is America, and even from thence the receipts of flour will not, we think, be nearly so great as estimated by common report. Under these circumstances, we cannot see sufficient cause for the prevailing panic, and have no hesitation in saying that farmers have it, in a great measure, in their own power to put a stop to the retrograde movement.

The transactions at Mark-lane have during the month been on a more restricted scale than at almost any previous period of the same duration within our memory.

The greater proportion of the wheat required by the millers has been derived by them from Lincolnshire, Cambridgeshire, and Norfolk. The cargoes shipped at the various ports on the east coast have gone direct to the manufacturer without appearing at market. Moderate, therefore, as have been the supplies from the near counties, the quantity exhibited at Mark-lane has proved more than equal to the demand; and from week to week prices have receded. To give a more accurate notion of the total fall, we shall quote the reduction as it occurred; beginning, then, with Monday the 6th. The article in the *Times*, to which we have above alluded, had a decidedly depressing influence on the trade; and though many doubted the assertion that the Peel Cabinet were about to undo their own work, still a fall of quite 2s. per qr. took place before buyers could be induced to purchase wheat. On that day week a further abatement of 2s. to 3s. per qr. had to be acceded to; and even at the decline, it was found impossible to clear the Kent and Essex stands. Confidence has since in some degree been restored; still, the downward movement continued up to the 22nd inst. The reported return of Sir Robert Peel to office was looked upon

as in some degree favourable, it being the general opinion that he would not be disposed to go so far as to sanction a total repeal of the existing corn laws. On the strength of this supposition, the millers manifested rather more disposition to purchase; and a moderate extent of business was done, at prices 1s. to 2s. per qr. above those previously accepted. This advance has since been maintained, and it is to be hoped that the turn in the trade at the metropolitan market may have the effect of restoring confidence in the provinces.

In free foreign wheat the operations have been on even a more restricted scale than those which have taken place in that of home growth. It is perfectly true that it has been almost impossible to grind the new English without a mixture of old foreign; but most of the leading millers had tolerable stocks of the latter on hand, and have therefore had little occasion to come into the market to buy. The transactions have been further restricted in consequence of the firmness which holders have displayed, few of the latter having at any period been willing to accede to a corresponding reduction to that which has taken place in the value of English.

During the first fortnight in December bonded wheat was wholly neglected; subsequently, some slight inquiry sprung up, but speculators expected to buy at much lower terms than importers were inclined to accept; hence, few bargains were closed.

The highest price bid for fine Danzig wheat in bond has not, we believe, exceeded 56s. per qr., whilst the article has been held at least 2s. per qr. above that rate.

During the month of November the bakers bought flour rather freely, and the fall which afterwards occurred in prices of wheat caused them to regret having purchased so largely. For the last two or three weeks the millers have experienced the utmost difficulty in effecting sales; and though they have reduced the top price from 60s. to 56s. per sack, this has failed to revive the demand. Ship flour has fallen in the same proportion; good Norfolk household having latterly been sold at 41s. to 42s. per sack in the river.

Hitherto the arrivals of flour from Canada and the United States into London have not been particularly large; but the decline in the value of that of home manufacture has influenced the prices of all other descriptions.

The market has been rather largely supplied with barley; a considerable proportion of the same has, however, gone direct to the distillers; and the quantity exhibited at Mark Lane has, therefore, been only moderate. Really fine malting samples have been actually scarce, and have rather risen than fallen in value; the best sorts having com-

manded 40s. per qr. The common kinds of malting, as well as distilling and grinding qualities, have, on the other hand, moved off tardily at gradually declining rates; a circumstance which has influenced the averages; and instead of the duty falling as many supposed would be the case, a rise of 1s. per qr. took place on the 18th December; and at present there is more chance of a further advance in the rate of duty than of a fall. Most of the trifling quantity (about 65,000 qrs. in the kingdom) was entered for home consumption at 4s. per qr. duty.

The malt trade has, on the whole, been languid; we cannot, however, note any alteration in quotations of the finer kinds; and even on the inferior sorts the abatement from the rates current last month has not been of much importance.

In our last number we had to notice a fall of from 5s. to 6s. per qr. on oats. We were then of opinion that the lowest point had been reached; but in this supposition we were not correct, the downward movement having continued up to the present time. The dealers who bought largely in November have since confined their operations to a very narrow compass; and as the supplies have on the whole been much more liberal than had been calculated on, factors have had no alternative; and have been obliged to give way where anxious to clear vessels whose lay days had expired.

Recently, very good Irish oats have been currently selling in the London market at 25s. per qr.; and foreign feed at from 23s. to 26s., according to quality. On English and Scotch oats the decline has been equally great; notwithstanding which purchasers have refused to take more than they deemed sufficient for immediate use. On the oats recently imported from abroad, there must be a very serious loss; indeed many of the cargoes have cost as much free on board at the port of shipment as they have realized here in bond; freight and other expenses having been wholly lost.

Though a considerable fall had occurred in quotations of beans previous to our last monthly report, the article was then still comparatively high; a further abatement of at least 3s. to 4s. per qr. having taken place.

The export demand for peas having almost wholly ceased, whilst the supplies have increased, prices have fallen materially. White and blue boiling peas have given way very nearly 10s. per qr., and maple and grey 5s. to 6s. per qr. since the close of last month. Latterly a few cargoes of white peas have arrived from the continent; these were bought at extravagantly high prices, and importers must be severe sufferers.

Before concluding our article we shall take a short retrospective view of the Foreign markets. By the

most recent accounts from the Baltic we learn that winter was apparently about to set in, and that most of the vessels, grain laden, had taken their departure from that quarter; therefore, no further shipments can be reckoned on till spring.

At Danzig there were about 200,000 qrs. of wheat in granary, a large proportion of which consisted of very ordinary quality. Supplies by water from the interior had ceased, and as in consequence of the very high prices of rye, a greater local consumption of wheat than in ordinary seasons was expected, considerable inroads would it was thought be made on the stock in hand during the winter months. The total shipments of wheat up to the end of November, had consisted of 33,780 lasts, whereof 24,000 lasts had been sent to Great Britain. Holders of really fine old wheat had not shown much disposition to submit to a corresponding reduction to that which the value of the article has undergone, in the English markets, and superior high mixed samples had at no period been sold below 55s. per qr., at which price they continued to be then still held. Rather an important abatement had however, taken place in quotations of ordinary sorts of new, mixed having been sold at 48s., fine mixed at 49s., and good high mixed at 50s. to 51s. per qr. free on board; the weight of these sorts was given as ranging between 58 to 60 lbs. per bush. The last freights paid for England had been 7s. and 7s. 6d. per qr. for wheat, which, with a very high premium for insurance, must make the cost here much above what the article would sell for at Mark Lane.

At the lower Baltic ports there are no old stocks of wheat, and the supplies of new having been only moderate, comparatively little business had taken place.

The shipments from Rostock have for the last month or two been comparatively unimportant, and at Stettin higher rates appear to have been paid by buyers from the interior than were permitted to be given by the limits of the English orders. The prices asked at these and neighbouring ports for spring shipment varied from 16s. to 50s. per qr.: unless, therefore, a material rise occurs with us, quotations must fall considerably on the other side before profitable business can be done.

There has been some talk of the Prussian Government prohibiting the export of rye and spring corn, and shipments of the inferior kinds of grain have actually been forbidden from Poland.

From Hamburg we learn that the wheat trade had become dull; moderately good qualities of red weighing 60 lbs. per bush. had been sold for home use at equal to 48s. 6d., but there were no sellers of fine Waren, either for immediate or spring delivery, below 54s. per qr.

During the months of October and November,

prices of wheat rose rapidly all over the southern and south-eastern parts of Europe, partly in consequence of a great deficiency in the yield of that grain in several of the principal states, and partly in anticipation of an extensive demand from Great Britain, Holland, and Belgium. Latterly, however, a reaction has taken place at the principal Mediterranean ports; still, prices are much too high to admit of purchases being made there with much chance of paying a profit on being shipped to England. The last quotations from Marseilles for good Polish Odessa wheat were 42s. to 44s. per qr. free on board, and other descriptions were held at corresponding rates. The freight from Marseilles to London would probably be 7s. or 8s. per qr., which, with insurance, would bring the cost here to at least 53s. to 54s., whilst this quality of wheat may at present be bought in bond on the spot at 50s. per qr.

At Leghorn, Trieste, Genoa, &c., quotations are equally high; except, therefore, such purchases as were made when the trade here wore a more promising aspect than at present, there is not much chance of anything being bought in that quarter—nearly the only one from which shipments could be made during the winter months.

From the ports further east, viz., Odessa and the Danube, the advices state that of the large exports of wheat made during the summer and autumn, comparatively little had been shipped to Great Britain, the principal part having gone to different places in the Mediterranean, and to Holland and Belgium.

We must now direct attention to the countries on the other side of the Atlantic. Of the quantity of flour shipped from Canada we have no official return, though the season had closed at the date of our last advices.

That the last crop of wheat grown in the United States has been a very productive one, admits of no doubt; and it is equally sure that the arrivals from thence will be on a much larger scale than in ordinary seasons. During the month of November upwards of 55,000 barrels were shipped from New York alone: but it is fair to infer that a proportion of the same was intended for the West Indies, and perhaps a small part for Holland and Belgium. That the late accounts from hence will have the effect of putting a stop to the export of the article is certain, as prices are now actually lower here than in some of the markets of the United States. The latest quotations from New York were for Genessee and other good western sorts 6½ d.: freight to England by the regular liners was 4s. 6d. per barrel. At present, similar flour may be bought in bond in Mark Lane at 29s. per barrel. When this becomes known on the

other side, shipments can scarcely we conceive be proceeded with. By a statement of the arrivals at New York down the Hudson we learn that against 1,400,000 barrels received in 1844, 1,500,000 barrels had come to hand in 1845.

CURRENCY PER IMPERIAL MEASURE.

DECEMBER 29.

WHEAT, Essex and Kent, new, red	52 58	White 50	63 —
Old, red.....	56 65	Do.	64 66 —
RYE, old.....	84 38	New....	58 40
BARLEY, Grinding, 28 31 Malting	36 —	Chevalier	36 38
Irish.....	27 28	Bere...	26 27
MALT, Suffolk and Norfolk.....	58 63	Brown..	56 60
Kingston and Ware.....	60 —	Chevalier	65 —
OATS, Yorksh. & Lincolnshire, feed	22 —	Potato..	26 —
Youghall and Cork, black..	20 22	Cork, white	28 24
Dublin.....	23 24	Westport	24 —
Waterford, white.....	21 23	Black ..	20 22
Newry.....	25 26		
Galway.....	20 22		
Scotch, feed.....	24 —	Potato..	27 30
Clonmel.....	24 —	Limerick	27 30
Londonderry.....	25 —	Sligo....	26 27
BEANS, Tick, new.....	34 38	Old, small	52 —
PEAS, Grey.....	36 —	Maple ..	36 —
White.....	48 50	Boilers..	50 —
FLOUR, Town-made 55 60 Suffolk	50 —	per sk. of 280 lbs.	
Stockton and Norfolk 48	Irish 50	52	

FOREIGN GRAIN AND FLOUR IN BOND.

WHEAT, Dantzic.....	52 56	fine —	60
Hamburg.....	50 52		
Rostock.....	52 54		
BARLEY.....	23 26		
OATS, Brew.....	24 28	Feed ...	10 22
BEANS.....	44 —		
PEAS.....	50 —		
FLOUR, American, per brl.....	30 32	Baltic ..	— 1

IMPERIAL AVERAGES.

Week ending	Wheat.	Barley.	Oats.	Rye.	Beans.	Peas.
Nov. 15th.....	58 6	35 0	26 3	38 2	44 5	45 7
22nd.....	57 11	34 1	25 5	37 1	43 4	45 4
29th.....	58 2	33 2	25 0	35 4	41 9	45 10
Dec. 6th.....	59 0	32 10	24 7	35 0	41 8	43 4
18th.....	59 4	32 9	24 6	36 8	40 8	43 6
20th.....	57 11	32 7	23 4	34 5	39 6	42 5
Aggregate average of the six weeks which regulates the duty.	58 6	33 5	24 10	36 1	41 11	44 4
Duties payable in London till Wednesday next inclusive, and at the Outports till the arrival of the mail of that day from London ..	14 0	5 0	4 0	6 6	1 6	1 0
Do. on grain from British possessions out of Europa ...	1 0	0 6	0 6	0 6	0 6	0 6

COMPARATIVE PRICES OF GRAIN.

WEEKLY AVERAGES by the Imp. Quarter, from the Gazette, of Friday last, Dec. 26th, 1845.		AVERAGES from the corresponding Gazette in the last year, Friday, Dec. 27th, 1844.	
s. d.		s. d.	
WHEAT.....	57 11	WHEAT.....	45 3
BARLEY.....	32 7	BARLEY.....	34 2
OATS.....	23 4	OATS.....	21 10
RYE.....	34 5	RYE.....	32 0
BEANS.....	39 6	BEANS.....	35 11
PEAS.....	42 5	PEAS.....	35 4

STOCK OF GRAIN IN BOND IN LONDON DEC. 5.

Wheat. qrs.	Barley. qrs.	Oats. qrs.	Beans. qrs.	Peas. qrs.	Rye. qrs.	Flour. cwts.
322,869	8,421	63,791	—	—	—	57,362

PRICES OF SEEDS.

DECEMBER 29.

The transactions in the seed market afford little scope for remark, and the only change in prices we have to notice is a further small decline in Canary-seed.

SEED, Rape.....	27l. 28l.	Irish ..	22l. 26l. per last.
Ditto, new.....	25l.	—	l. per last.
Linsced, Baltic..	40 44	Odessa	45 47
Mustard, white	10 12	brown —	per bush.
Linsced Cakes, English..	—12l. 0s. to —13l. 0s.	per 1000	
Do. Foreign..	—l. 0. to —l. 0s.	per ton.	
Mediter. & Odessa	44 45		
Tares, Winter.....	7s. 9d. to 8s. 3d.		
Baltic.....	—		
Linsced, English, sowing	54 60	crushing	45 47 per qr
Carraway.....	44 46	new ..	48 50 per cwt.
Coriander.....	11 14	per cwt.	
Mustard, brown, new...	10 14	white..	10 12 p. bush
Hempseed.....	35 38	per qr.	
Trefoil.....	17 24	old.. — new —	
Rye Grass, English.....	—	Scotch —	nominal.
Canary, 52 54 per qr.	fine	56s.	
Tares, old....	— —	new—	per qr.

PRICES OF HOPS.

BOROUGH, MONDAY, DEC. 29.

The demand for best new Kent bags has been moderate, and the quotations have been fully supported. In other descriptions the transactions have been very limited, but we do not note any change in prices. Sussex pockets are about 6l. 10s. to 7l. per cwt; Weald of Kent do., 6l. 10s. to 7l. 10s.; Mid-Kent do., 7l. 7s. to 9l. 10s.; and East Kent do., 8l. 5s. to 10l. 10s.

POTATO MARKET.

SOUTHWARK, WATERSIDE, DEC. 29.

The supply to this market during the past week was very limited by the usual conveyance, yet some sailing vessels arrived both from Yorkshire and Scotland, and fortunately they had a quick passage, for the best of the reds would not stand a long one; for the disease was very evident in the last arrivals, and it would have destroyed the cargoes if they had had a long passage. There was a number of tons arrived from Scotland by the steam-boats, and from Yorkshire by the steam-boats and by the railways, which kept this market sufficiently supplied for the very limited demand.

The prices ranged as follows:—York reds from 50s. to 130s.; York Regents from 100s. to 130s.; Scotch reds from 90s. to 100s.

WOOL MARKETS.

BRITISH.

WAKEFIELD, Dec. 26.—Christmas week is usually a dull one for sales of wool; this week has been more than ordinarily so, and transactions have been on a most limited scale. Indeed, the seller and buyer seem both disposed to hold off till the new year sets in, and the market may be said to be in abeyance.

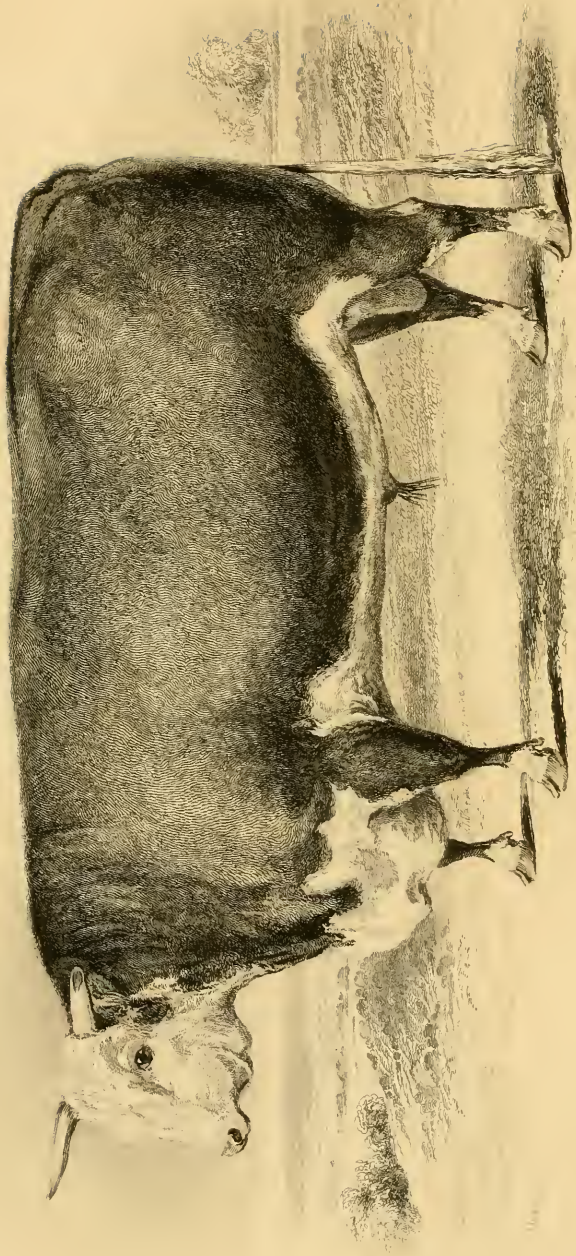
LIVERPOOL, DEC. 27.

SCOTCH.—As usual at this season of the year, the demand for Laid Highland Wool is limited. The same remark will apply to all kinds of Scotch Wools; and prices nominally the same as for the last few weeks.

	s. d. s. d.
Laid Highland Wool, per 24lbs	9 3 to 9 9
White Highland do.....	12 3 15 3
Laid Crossed do. unwashed.....	11 6 15 0
Do. do. washed.....	12 6 14 0
Do, Cheviot do. unwashed.....	12 0 14 0
Do. do. washed.....	15 0 13 0
White Do. do.....	24 0 23 6

THE FARMER'S MAGAZINE.
PRICES OF SHARES.

Shares	Div. last half year	RAILWAYS.	Price per Share.		
		Aberdeen	51 pd		Kendal and Windermere 251 sh 1 1/2 pd
24,000	21 p sh	Armagh, Coleraine, and Portrush 251 sh 1 1/2 pd	5 1/2 a 1/4	5,000	Killarney Junctions
4,000		Aylesbury and Thame	251 sh 1 1/2 pd	16,000	Lancaster and Carlisle
		Belfast and County Down	251 sh 1 1/2 pd		Leeds and West Riding Junct.
9,500	10s	Bideford and Tavistock	1 1/2 pd		Leicester and Birmingham 207 sh 22s pd
10,000		Birmingham and Gloucester 1001 sh pd	127 a 5 1/2		Leicester and Bedford
30,000		Do. New, iss. 7 1/2 dis.	251 sh 1 1/2 pd	5,100	Leicester and Tanworth
		Birmingham and Oxford Junction,	201 sh 21 pd	7,963	Limerick and Waterford
				11,475	Liverpool & Manchester
		Boston, Stamford, and Birmingham.	22s pd		Ditto Half Shares
9,500		Brighton, Lewes, & Hastings, 501 sh 20 pd			Ditto Quarter Shares
15,000	17 8s p sh	Bristol and Exeter	1001 sh 70 pd		Liverpool & Leeds Direct 501 sh 2 1/2 pd
		Ditto New	391 sh 21 pd		Lpool, Manch., and Newcastle Junction
6,640	12s p sh	Bristol and Gloucester	501 sh 30 pd	4125000	London & Birmingham
		Bristol and Liverpool Junction 241 pd		41,250	Ditto Thirds
36,000		Caledonian	501 sh 101 pd	54,450	Ditto Quarter Shares
		Do. Extension	501 sh 21 pd		Ditto Fifths
60,000		Cambridge and Lincoln	251 sh 1 1/2 pd	48,000	London and Birmingham Extension
		Do New	251 sh 1 1/2 pd		London & Blackwall
		Canterbury and Dover	1 1/2 pd		Ditto New
		Cheltenham and Oxford	21 pd		Ditto Extension
42,000		Chelmsford and Bury	1 1/2 pd	36,000	London and Brighton
		Chester and Holyhead	501 sh 15 pd	4,500	Ditto Consolidated Eighthths 501 sh 35 pd
		Chester and Manchester	42s pd		Ditto Sixths
		Clydesdale Junction	51 pd	33,000	London & Croydon
		Cork, Blackrock, and Passages	22s sh 22s pd	33,000	Do. Guaranteed 5 per Ct.
		Cork and Killarney	501 sh 2 1/2 pd		Lon., Chel., Oxf., Glouc., and Hrd.,
40,000		Cork and Waterford	251 sh 1 1/2 pd		London & Greenwich
		Cornwall	501 sh 51 pd	43,077	Preference or Privilege
4,800		Coventry, Nuneaton, Bir., & Leicester,	251 sh 1 1/2 pd	11,136	London, Hounslow, & Western
					London & South West
		Derby, Uttoxeter, and Stafford 241 pd		46,200	Ditto Consolidated Eighthths, 401 sh 20 pd
		Direct Manchester (Remington's) 201 sh			Ditto New
		Do. Do. (Rastrick's)	51 pd		Ditto New
		Direct Northern	501 sh 21 pd	50,000	London and York
85,000		Direct Norwich	201 sh 11 pd	20,900	London and Windsor
		Dublin and Armagh	1 1/2 pd		London, Warwick, & Kidder 501 sh 2 1/2 pd
21,600		Dublin and Belfast Junction	501 sh 5 pd	10,000	London, Salisbury, & Yeovil 501 sh 2 1/2 pd
19,060		Dublin, Belfast, & Coleraine, 501 sh 2 1/2 pd		10,000	Londonderry & Coleraine, 501 sh 2 1/2 pd
12,800		Dublin and Galway	501 sh 41 pd	8,000	Londonderry & Enniskillen 501 sh 2 1/2 pd
17,000		Dundalk and Enniskillen 501 sh 2 1/2 pd			Lynn and Ely
144,000	3s p sh	Eastern Counties	251 sh 141 16s pd	13,000	Lynn and Dereham
		Do. New	251 sh 61 16s pd	13,000	Manchester & Leeds
144,000		Do. Perpetual, No. 1.	61 18s 4d sh pd	13,000	Ditto Half Shares
		Ditto ditto. No. 2.	61 18s 4d sh pd		Ditto Quarter Shares
4,500		East Dereham and Norwich	11 pd		Ditto Fifths
2,000		Eastern Union	501 sh 251 pd	30,000	Manchester & Birmingham
		Ditto Quarter Shares	121 sh 3 1/2 pd	30,000	Do. 1/4 Shares
		East Lincolnshire	1 1/2 pd		Do. New 1/4 Shares
		East and West of England	1 1/2 pd		Do. Continuation and Welsh Junction
18,000	11 10s ps	Edinburgh & Glasgow	501 sh pd		Manchester, Buxton, and Matlock,
18,000	7s 6d ps	Ditto Quarter Shares	12 1/2 sh pd		Manchester, Buxton, and Matlock,
26,000		Ditto New 1/4 Shares	12 1/2 sh 7 1/2 pd		Manchester to Southampton
26,000		Edinburgh and Northern, 251 sh 1 1/2 pd		4155400	Midland
		Edinburgh and Perth	1 1/2 pd	12,500	Ditto Fifths
10,800		Ely and Huntingdon	251 sh 51 pd		Ditto New
		Enniskillen and Sligo	2 1/2 pd	0785000	Ditto Birmingham & Derby
		Exeter, Yeovil, & Dorchester, 501 sh 2 1/2 pd		15,000	Midland Grt. West. (Irish) 501 sh 2 1/2 pd
		Glouc., Aberystwith, and Central of Wales	251 sh 1 1/2 pd		Do. Extension to Sligo
		Goole Doncast. & Sheffield, 201 sh 42s pd	1 1/2 pm	20,000	Newcastle & Berwick
10,918	51 per ct	Grand Junction	1001 sh pd		Newcastle and Carlisle
10,918	51 per ct	Ditto Half Shares	501 sh pd		Newcastle, Durham, and Lancashire Junction
10,918	51 per ct	Ditto Quarter Shares	251 sh pd		Newcastle & Darlington Junct.
		Grand Union (Nottingham & Lynn) 1 1/2 pd	1 1/2 a 3	20,000	Ditto New (Branding)
		Great Eastern and Western	2 1/2 pd	10s p sh	Newport and Aberavenny
12,000		Great Grimsby & Sheffield, 501 sh 51 pd			New Ross and Carlow
20,000		Great Southern & Western (Ireland)	501 sh 151 pd		Newry and Enniskillen, 501 sh 2 1/2 pd
				24,000	Newark, Sheffield, & Boston 251 sh 2 1/2 pd
		Ditto Extension	501 sh 12 1/2 pd	36,000	North British
		Great Munster	2 1/2 pd		Ditto 1/2 Shares
10,000	31 p sh	Great North of England	1001 sh pd		Ditto Carlisle Extension, 12 1/2 sh 1 1/2 pd
	10s p sh	Ditto New	401 sh 51 pd		Ditto Dalkeith
		Ditto New	301 sh 21 pd		North Devon
		Great North of Scotland	2 1/2 pd		Northern & Eastern
25,000	41 per ct	Great Western	1001 sh 801 pd	10,266	Do. Scrip
25,000	41 per ct	Ditto Half Shares	501 sh 65 a 4	3,186	Do. 1/4 Shares
		Ditto Quarter Shares	2 1/2 pd	12,208	Do. New
37,500	41 per ct	Ditto Fifths	201 sh 201 pd		North Kent & Direct Dover, 501 sh 2 1/2 pd
		Guildford, Farnham, and Portsmouth,	501 sh 51 pd		North Staffordshire
20,000		Harwich	201 sh 11 pd		North Wales
8,000	17 15s ps	Hull and Selby	501 sh pd		Norwich and Brandon
8,000	3s 9d p sh	Do. Quarter Shares	12 1/2 sh pd		Ditto New
8,000		Do. Half Shares	251 sh 21 pd		Nottingham, Banbury, & Chelst.
15,000		Inverness and Elgin	201 sh 11 pd		Nottingham and Boston
80,000		Irish North Midland	1 1/2 pd		Nottingham, Erewash Valley, & Manchester
		Isle of Axholme	2 1/2 pd		



THE FARMER'S MAGAZINE.

FEBRUARY, 1846.

No. 2.—VOL. XIII.]

[SECOND SERIES.

PLATE I.

A HEREFORD BULL.

The subject of our first plate is a Hereford Bull, five years and six months old, the property of, and bred by Thomas Sherriff, Esq., of Coxall, Herefordshire. The prize of Thirty Sovereigns was awarded to this animal at the Meeting of the Royal Agricultural Society, held at Shrewsbury, in July last.

PLATE II.

PLAN OF FARM-BUILDINGS, AT WESTER-FINTRAY, ABERDEENSHIRE.

(For description see page 117.)

THE COMPOSITION OF ORGANIC MANURES.

Their Gases.—Hydrogen.

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

(Continued.)

We have seen what an important constituent, of organic fertilizers, is nitrogen—a gas which exists, however, in vegetable substances, in the least proportions of any of the gases. In the next smallest proportion of gaseous substances forming an essential portion of all vegetable substances is hydrogen—the lightest, and perhaps the most universally present, in some combination or other, of all the gases. In the vegetable structure we find it in every place: thus, as I have elsewhere had occasion to observe—

	Parts.
100 parts of gluten from wheat contain of	
hydrogen	14·5
starch from wheat	6·77
sugar	6·90
100 parts of gum	6·93
bees' wax	12·67
wood of the oak	5·69
wood of the beech	5·82
acetic acid (vinegar)	6·35
oxalic acid	0·224
tartaric acid	3·95
citric acid	3·80
benzoic acid	5·16
gallic acid	5·
camphor	14·49
rosin	10·71

The sources whence plants derive their hydrogen are either from the decomposition of water, or from the putrefaction of organic matters. Liebig appears rather to incline to the opinion that water is the chief source; he observes, "From their generating caoutchouc, wax, fats, and volatile oils, containing hydrogen in large quantity, and no oxygen, we may be certain that plants possess the property of decomposing water, because from no other body could they obtain the hydrogen of those matters. It has also been proved, by the observations of Humboldt on the fungi, that water may be decomposed without the assimilation of hydrogen. Most vegetable structures contain hydrogen in the form of water, which can be separated as such, and replaced by other bodies; but the hydrogen which is essential to their constitution cannot possibly exist in the state of water. The solid parts of plants (woody fibre) contain carbon and the constituents of water, or the elements of carbonic acid gas together with a certain quantity of hydrogen. We can conceive the wood to arise from a combination of the carbon of the carbonic acid with the elements of water under the influence of solar light. In this case 72·35 parts of oxygen, by

weight, must be separated as a gas for every 27·65 parts of carbon which are assimilated by a plant; or, what is much more probable, plants under the same circumstances may decompose water, the hydrogen of which is assimilated along with carbonic acid whilst its oxygen is separated."—(*Org. Chem.*, p. 65.)

That hydrogen gas exerts a considerable influence upon the leaves of plants was first noticed by Dr. Priestley. Sennebler found that plants which lose their green colour in the dark preserve it under that circumstance, if a small portion of hydrogen gas is present in the atmosphere in which they are placed; and Dr. Ingenhouz noticed that its presence when they are growing in the light renders their colour of a deeper green.—(*Ann. de Chim.* vol. iii., p. 57.) And again, Mr. Humboldt has noticed that the *poa annua*, *trifolium arvense*, and other plants growing in the galleries of coal mines, preserve their green colour, although vegetating in the dark; and that in such situations the atmosphere contains a proportion of hydrogen gas.

And with regard to the carburetted and sulphuretted hydrogen and carbonic acid gases evolved during the putrefaction of animal and vegetable manures, the discoveries of the chemist are equally instructive and confirmatory of the observations of the intelligent farmer: the one finds that these gases, so grateful to the farmer's crops, are the most copiously emitted in the early stages of putrefaction; that these gradually decrease in volume as the fermentation proceeds; and, finally, when the mass is reduced to the state of vegetable mould, cease altogether. Now, the farmer is well aware that the manure of the farm-yard, in common with all organic decomposing fertilizers, is by far the most advantageously applied, and produces the most permanently good effect, when it is used in the freshest state that is at all compatible with the destruction of the seeds of weeds, with which such collections usually abound. He is also aware that in all situations where the gases of putrefaction are emitted, such as near to stables, marsh ditches, covered drains, &c., there vegetation of all kinds indicates, by its rank luxuriance, that some unusual supply of nutriment is afforded. The gardener in his best arranged hot-beds notices that the gases which ascend from his piles of litter through the earth (which earth is not in immediate contact with the dung) produce the same effect long after all the *warmth* of putrefaction has subsided. The growth of some of his plants is in this way *stimulated*, he says, in an extraordinary manner. These facts, these observations, are entirely confirmed by those of the chemist: he notices that all the gases of putrefaction are exactly those which are the most grateful to the growth of plants; that air which has

been spoiled by the presence of the gases evolved in putrefaction, or by the breathing of animals, is exactly that which is the most grateful to vegetation; and that where those gases are applied to the roots of plants in the most skilful manner, so as to ensure a regular, steady supply, then the plant is enabled to vegetate in a most vigorous and unusual manner. Thus, when green manures, such as seaweed, buck-wheat, leaves of fern, &c., the most slowly decomposing of all vegetable manures, are applied to the roots of plants, the effects, according to chemical experiments, are excellent; and, as I have elsewhere observed, the farmer assures us that they are so. He tells us that all green manures cannot be applied in too green a state; that the best corn is grown where the richest turf has preceded it; and that where the roots, stalks, and other remains of a good crop of clover are ploughed in, there an excellent crop of wheat may be expected; and that when a crop of buck-wheat is ploughed into the soil, this is most advantageously done when the crop is coming into flower. The chemist, again, explains this without any difficulty. Davy and other chemists have shown that when the flower is beginning to appear, the plant then contains the largest proportion of easily soluble and decomposable matters; and that when these green plants are in this state buried in the soil, their fermentation is checked and gradual, so that their soluble or elastic matters are readily absorbed by the succeeding plants, and every portion of it becomes subservient to the demands of other crops.

No scientific cultivator ever examined this question more accurately, or tried his experiments with more neatness, than the late excellent President of the London Horticultural Society, the lamented T. A. Knight; and these were the more valuable from being instituted to ascertain the state of decomposition in which decaying vegetable substances could be employed most advantageously to afford food to living plants. This he clearly proved, however erroneous his explanations of his own observations and discoveries. One of his experiments with a seedling plum-tree was very remarkable. He placed it in a garden-pot, having previously filled the bottom of it with a mixture of the living leaves and roots of various grasses covered over with a stratum of mould. The plant appeared above the surface of the ground in April, and, during its growth in the summer, was three times removed to a larger pot in the green-house (in every case, the bottom of them being filled as at first with living grasses, covered over with a layer of mould); and by the end of October its roots occupied a space of about one-third of a square foot, it having then attained the extraordinary height of nine feet seven

inches. This experiment was varied by Mr. Knight in several ways; he drilled turnip-seed over rows manured with green fern-leaves, and compared the produce with other rows of turnips by their side, manured with rich vegetable mould; and in all cases those which grew over the gradually fermenting green fern not only grew more rapidly than those treated in any other manner, but they were distinguished from all others in the same field by their deep green colour. Now, when the gases of putrefaction are mixed with the roots of all growing crops, this is exactly the effect produced. The most foul, stinking water, even when transparent, is ever the most grateful to plants; that from stagnant waters, which has always a peculiar taste, from the carburetted hydrogen it contains, is excellent. Every gardener prefers that from pools, however clear, for watering: the purer water from wells, he tells you, is very inferior—it is *too cold*; but then, he confesses that even warming it does not render it equal to that from stagnant places, in its effects upon his plants; so that, in whichever way the experiment is made, there is no doubt of the value of these gases to the cultivators' crops; and he will therefore readily agree with Knight in the conclusion, that any given quantity of vegetable matter can generally be employed, in its recent and organized state, with much more advantage than where it has been decomposed, "and no inconsiderable portion of its component parts have been dissipated and lost during the progress of the putrefactive fermentation."—(Trans. Hort. Soc., vol. i., p. 248).

There is no doubt of the highly important value of the hydrogen evolved from the manures applied to the roots of plants. Those fertilizers, such as train oil (which contains 16.1 per cent. of hydrogen), fat (which contains about 12 per cent.), and many others in which it is found, exert a powerful effect on the farmers' crops. And as I have had occasion to remark in another place, when applied to the roots of plants in moderate proportions, the influence of the compounds of hydrogen gas is evidently beneficial. In many situations this gas is copiously evolved in combination with carbon (forming carburetted hydrogen), or with sulphur (forming sulphuretted hydrogen), as over drains, stagnant waters, dung-hills, &c. Now, it is well known that the plants growing over such places are commonly very rank and luxuriant. A small portion, therefore, of carburetted hydrogen gas in the atmosphere, or in the soil in which plants are placed, certainly promotes their vegetation; and hence one advantage derived from the application of decomposing organic fertilizers.

The effects produced by these magic assimilations of hydrogen with the constituents of vegetation are full of subjects of the greatest interest and instruction to the farmer, who, when he regards the transmutation of these stinking compounds of hydrogen gas into such widely different forms of vegetable fragrance, sweetness, and usefulness, cannot hardly fail to feel fresh incentives for the chemical examination of the works of their Divine Author.

FOREST AND ORNAMENTAL TREES.

BY J. TOWERS, M.R.A.G.S., HORT. SOC., &C.

As the year is now decidedly on the advance, and, so far as respects the winter generally, with a character entirely dissimilar to that of 1844-5, we return to the present subject.

The removal of trees, deciduous, not evergreen, requires mature consideration; for although writers in general treat the subject with regard to time with some indifference, yet much depends upon local peculiarities. It cannot be questioned that every plant, as it approaches the period of its own growth, is removed with the greatest certainty of success, all conditions being favourable; because atmosphere, meteorology, and temperament of soil being propitious, the roots, and with them the buds, are in a fitting state to expand and grow with little loss of time.

But there are several contingencies which ought

to govern the proceedings of the planter. If the spring season be locally and early dry (as we find it six times of seven in the east of Berkshire), and any deciduous tree or shrub be removed from a distant situation which may require some hours' or a day's delay, the rootlets must become dry; and though a nicely pulverized soil, which can be trickled among them, and made to touch even the smallest fibres, is a most favourable circumstance, yet it cannot be all-sufficient; and rain failing, as it frequently does in this part of the country during six or more weeks, the subject has to depend upon artificial waterings—a poor substitute at the best for the genial spring showers, and especially when these aids are more than neutralized by a parching atmosphere, and the burning sun of April and May.

Autumnal planting, therefore, is the more safe,

provided it be completed by the end of October; but if delayed till the end of November, and thence onward till mid-January, the roots cannot stir at all, and thus they remain torpid during the chills and swampings of cold rain, snow, sleet, and ice. With these cautionary remarks the gardener must be left to adapt his operations to existing conditions.

The ASH (*Fraxinus*) is essentially a forest tree. The genus abounds in species, nearly thirty of which are natives of North America. These are not very well known here according to Loudon; but those of Britain, of which *Fraxinus excelsior* is first and chief, is one of the finest trees that adorns the forest. Botanically, it stands in the Linnæan class *Polygonia*, order *Diacia*; the flowers being hermaphrodite and female on the same tree. Lately the tree has been referred to the 129th Order of the Natural Classification, *Jasminæ*, and to its second tribe *Oleina*, or the Olives. There are four varieties of this tree: the first, the tall forest ash just named, which attains the height of 80 feet; the second is β (beta), *Fraxinus pendula*, the weeping ash; and these alone will form the subjects of the present article.

The Common Ash is easily raised from seed, and grows rapidly. Seedlings are observed wherever there are trees which produce the "keys," as the seed-vessels are called; but in the nurseries they are sown in drills, and with common attention yield a great number of young plants, which being once transplanted become, in a few seasons, fitted for final removal to plantation. The soil most suitable is a sound, unctuous loam; but the ash is not difficult in its choice. The full-grown tree is not very suitable to ornamental grounds; though, as Gilpin remarked, as to picturesque "nothing can have a better effect than an old ash hanging from the corner of a wood, and bringing off the heaviness of the other foliage with its loose pendent branches." Its greatest defects are the tenderness of this foliage, as the leaves are developed very late in the spring, and fall under the influence of a very slight early frost, its honours therefore soon pass away.

But the uses to which the tree at all ages are applied are great and exceedingly numerous. "In the arts of peace as well as of war, in architecture, tillage, and manufactures, the ash objects to business of no kind; while even its refuse spars (and we may add the grubbed roots if dried) are accounted the best fuel in the forest."

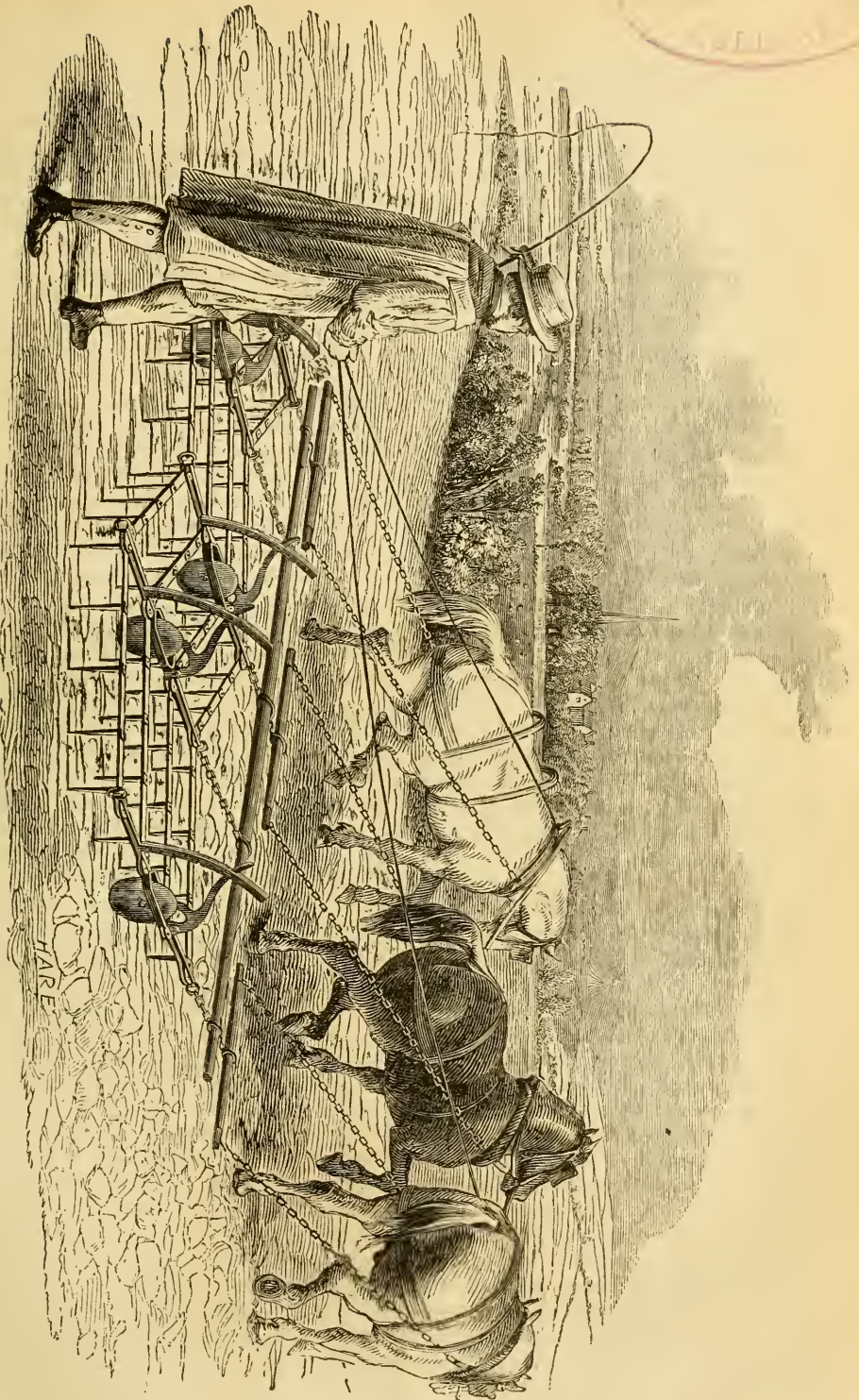
Straight young ashen plants furnish excellent hop-poles, and are abundantly used as such, though

poles of oak may in the end be more durable. Cobbett, with his customary predilection for everything American, has dwelt upon seven or eight of the trans-atlantic ashes. He however recommends the American *White Ash* as the only one which can rival the English species already described. It has, he observes, more beautiful foliage, grows faster, and produces a timber vastly superior; adding, a great deal of it is brought to England in plank. Michaux, in his "North American Silva" says, that Mr. Oddy, in his treatise on European Commerce "acknowledges it to be superior, for many purposes, to the common European ash."

The WEEPING ASH (*Fraxinus pendula*) is purely ornamental, and suitable to lawns and insulated grass-plots, among those discursive meanderings—if this expression be allowed—which we now and then meet with in the extensive shrubberies of a large property. The finest and most perfect model of a single tree may perhaps be found in the lawn of an ornamental piece of ground opposite to what was the Sun hotel, ere railroads had a name: it forms a complete arbor, capable of accommodating a large party about a round table, perfectly screened and sheltered.

Any tree planted in deeply worked suitable loam could be made equal to this specimen by judicious formal training, to stakes and hoops, or, what would be far better, to an iron trellis, with perfectly circular horizontal rails, leaving one opening as an entrance on the side exposed to view. The tree suits the lawn, as has been said; but being very formal in figure, it perhaps would be most completely in its proper place in some small green-plot amidst shrubs, concealed from view, to which a party might retire with perfect privacy and cool shade.

The height of the perpendicular main stem should be twelve feet at the least, and such trees may be found in a good nursery; but the adroit amateur, by raising and training common ash seedlings, might form his own plants, by grafting a certain number of well-placed young branches (cut back in March or April), arranged in circle at the summit of the main stem, so as to furnish the skeleton of the future pendent branches; or better still, by budding in the moist weather of July, in two-year old wood, the full, bold eyes of some younger shoots of the genuine weeping variety. All must depend upon truth of character and skilful manipulation in the first operation, and subsequently upon judicious training.



GOLEMAN'S PATENT EXPANDING LEVER HARROW.

HARE

COLEMAN'S PATENT EXPANDING LEVER HARROW.

Next to the plough, the harrow may be regarded as the most important implement used in the cultivation of the soil, but which has not received that consideration to which it is entitled. With many it would seem a matter of perfect indifference what kind of harrow is to be used; hence the practice of making one or two inferior implements, constructed in the rudest manner, serve for all the purposes of harrowing, whether the land be light or heavy, dry or moist; whether a light or heavy, a coarse or fine harrow is required; whether for cleaning lands, pulverizing the soil, or harrowing in the seed, the same implements are in request. To every scientific agriculturist it is clear that, for all the purposes of harrowing either a great variety of harrows constructed on the old system is necessary, or a harrow that will adapt itself to the variety of purposes above referred to must be invented; this desideratum is, to a great extent, supplied by the implement represented in our engraving, which embraces in one a wide or narrow, a coarse or fine, a light or heavy implement, and is easily changed from one to the other. These harrows are made in four compartments, each about 3 feet, making together 4 yards in the whole width. This implement is drawn by five chains attached to the long whippetree by double hooks; when an alteration is required to be made either in its width or fineness, all that is necessary to be done is to lengthen or shorten the two longest chains; for example, if a narrow or fine harrow is required, by letting out these chains the angles become more acute, and the teeth travel in closer lines; on the other hand, if a coarse or wide harrow is wanted, the two chains above referred to must be shortened, and by this means any width between 6 and 12 feet may be obtained. Again, when a light harrow is required, the levers must be pressed down and secured by the pins, which fasten them to the guard, when the weight of the implement will be thrown upon the wheels, and thus made to pass lightly over the land; but when a heavy harrow is wanted the levers before mentioned must be raised, when the wheels will serve as weights to press the tines into the soil; thus when the whole weight of the implement, including the wheels, is thrown upon the tines—they will be so pressed into the land as to require the power of four horses to draw it; yet, by pressing down the levers as before referred to, it may be made easy work for two horses. In the arrangement of the tines care has been taken that

each should cut a separate piece of land, and, the joints being constructed on the principle of a parallel ruler, the relative distances of the tines are uniformly maintained at whatever width the harrow may be set. It is also suitable either for level or for ridge land; the flexibility of the joints allowing it to adapt itself to the most abrupt inequalities.

The wheels are so shaped as to present a smooth surface to the soil, thereby preventing adhesion when wet; the bars also into which the tines are inserted being placed diagonally, enables it more readily to pass over obstructions. The same wheels which regulate the pressure of the implements are also used to convey it from one part of the farm to another, thus rendering a cart or slade unnecessary.

We cannot conclude this description without congratulating Mr. Coleman on the success of his exertions to improve this most important implement, and trust that his labours to make it efficient under every variety of circumstances will be duly appreciated and rewarded by our farming friends.

EXTRACT FROM A REPORT ON THE IMPLEMENTS AND MACHINES EXHIBITED AT THE HIGHLAND SOCIETY'S SHOW, 1845.

CLASS II.—For any new and useful Agricultural Implement or Machine that has been satisfactorily tested in actual work, not previously exhibited in competition, a premium of £5.

Entry 1st.—Richard Coleman, of Colchester, Essex, exhibited his patent expanding lever harrows, in two sizes, his own invention. These harrows embody two essential points—1st, the principle of their expansion, which is based on a strictly geometrical principle, that a parallelogram divided into any number of lesser parallelograms, by lines drawn parallel to two of its contiguous sides, will have these smaller, each exactly similar to the original figure, and whatever degree of obliquity may be given to the greater, each of the lesser will undergo the same change, preserving the exact similarity of figure; 2nd, the harrows being supported on small wheels attached to levers, whereby any degree in depth of penetration by the tines is readily obtained at pleasure, by changing the position of the levers.

The first property is an important one as applied to the harrow, and the changeable nature of the parallelogram, when not tied by a diagonal, as well as the constant similarity of its integral divisions

are very beautifully brought to bear in this improvement. By their means this harrow is capable not only of making every tine form a distinct line in the soil, like the best kinds of common harrow, but the distance between the whole of these lines can be varied with mathematical exactness, both as to equality one with another and to extent of variation; thus they will draw lines that shall be all four inches or all one inch apart, or at any fractional part of the distance between these; and the construction being effected, the changes are produced by simply changing the place of a hook in a chain. We have few examples in agricultural machinery where a geometrical principle has been so

happily applied, and applied too to one of the rudest of implements.

The variation in depth of penetration seems also a considerable step in the perfection of this harrow, that being a point in which all others are defective. An objection was made to the use of cast iron in these harrows, but the inventor stated that he also makes them entirely of malleable iron. *As these harrows were not tested in the field, it would be premature to pronounce upon their practical efficiency**, though in principle they are in advance of all others. Under the circumstance also of these harrows being patented, the judges, though approving, could not do more than award to Mr. Coleman a premium of 3*l*.

LECTURE ON THE TREATMENT OF DECAYED POTATOES, AND ON SEED FOR A FUTURE YEAR.

BY DR. LYON PLAYFAIR, Consulting Chemist to the Royal Agricultural Society.

In the last lecture the nature of the so-called disease in the potato was considered, and shown to be a decay of the cellular tissue, which was unable to resist the action of external influences. The probable cause was considered to be the unusual sunless nature of the season at that period of the year when both the plant and the tuber required most direct solar action.

If the nature of the disease be admitted, then a most important practical consideration arises. The constitutional weakness in the cell walls must exist in all those potatoes which, as yet, have shown no symptom of decay. This being the case, every potato is liable to yield to external influences, and will certainly decay unless it be placed under such conditions as to render the progress of decay impossible. We know what these conditions are, and therefore the further progress of the malady must be entirely the result of negligence and ignorance.

With the complete conviction that potatoes will still progress in decay unless cared for and properly treated—with a full knowledge that even the extent of the calamity will not induce the peasant at once to depart from his former coarse mode of treating the tubers, it becomes a most important question for intelligent farmers, where they are to look for seed for a future year. Under ordinary circumstances I would have refrained from lecturing on this practical point, but the conditions are peculiar, and science can be our only guide; for experience does not exist to point out a well-trodden path upon which Practice herself may walk without scientific aid. The question becomes of great importance,

when we consider the state of the crop. Whatever may have been the case in favoured localities, all those who have had access to the most extensive information agree that the potato crop this year was not much, if at all, above the average. This being the case, we must have had in this country only a sufficient supply of seed and for domestic consumption. A considerable part, no matter what proportion, of the crop is destroyed; and, therefore, supposing the home consumption to be as great as formerly, there must be a deficiency of seed for spring planting, if we continue to follow the old methods. But these methods are not indispensable; and therefore, it is of importance to know how far we may relax them, so as to suit the exigencies of the present case.

The anatomical structure of a plant is very complex, but its organization, so far as it is necessary to view it with relation to agriculture, is remarkably simple. It is well known that one part of a plant may be transformed into or be made to produce another. The leaf of an orange or fig-tree, when planted, produces a new orange or new fig-tree; the branch of a tree stuck in the ground is changed into a tree similar to that which produced it; the tuber, or fleshy enlargement of the stem of the potato plant, occasions a new plant to arise: and the transformation or production has been so far carried on, that Woodward turned a willow tree upside

* This is a mistake; they were thoroughly tested the day before the meeting at Dumfries, much to the satisfaction of the judges.—R. C.

down, and the branches put in the earth a fibrous structure like roots, and the roots themselves soon became covered with leaves like branches. It is not necessary for the production of a plant to use the seed itself, and on this account we may grow the potato in several different ways. We may produce it from the seed, which contains the true embryo; we may raise it from the tuber, or whole potato; or we may grow it by planting only part of the tuber. Let us consider the mode of growth in each of these three cases, in order that we may be satisfied as to the course which should be adopted in the present exigency.

The seed of the potato is contained in the green *apple* or capsule, which becomes black when ripe. The seed is removed from this capsule, and spread out in the sun to dry. As an agricultural operation, the seed is occasionally planted in spring by sowing it broadcast, and the tubers taken up in October. By that time they have acquired the size of small plums, and are preserved and sown again next April.

Before gathering this second year's crop it is necessary to bear in mind a peculiar circumstance connected with the produce of the seed. When potatoes are grown from the tuber, any peculiarity which this may have exhibited, such as early growth, colour, or tenderness, is exhibited and perpetuated in its descent. Thus, a York red produces invariably a York red, and not a kidney; but this is not the case with the produce of the seed. In the crop grown from seed, we do not find the peculiarities of the plant on which it grew, but find mixed together, white, red, and dark-coloured potatoes, some being round, some oval, some kidney-shaped. Their habits also are very different: thus, we have some coming to an early, others to a late maturity; some are coarse, others tender, in their growth. In reaping, therefore, the second year's crop we must recollect to watch the plants, and separate them according to their peculiarities. Those which ripen early, as shown by the dying away of the stem, must be first gathered, in order to perpetuate this peculiarity in their descendants. The kidney-shaped tubers are to be separated from the others, and like attention must be paid to select and keep those varieties which show any peculiar merits. As a horticultural operation, the return from the seed can be accelerated. They may be grown in hot-beds, and by transplanting into other pots the plants may be ready for border or field culture in the spring, and thus produce tubers of a larger size than those obtained by sowing the seed broadcast. But all this must suffice to show you that the growth from seed is not that to which we must look as calculated to relieve the scarcity of seed potatoes for the year now approaching.

The second plan of growing potatoes is from the whole tuber. The tuber being merely a continuation of the stem, is furnished like it with buds, or eyes, symmetrically arranged on each side. These buds are capable of growing plants, but when the whole tuber is planted it is usual for them to yield to the upper buds or crown, either by not putting forth shoots at all, or by giving very feeble ones. There are two periods at which the tubers are planted; usually the spring is selected, but autumn or winter has been found to answer equally well, if they are planted deep enough to prevent the attacks of frost. The advantage of planting them now consists in the earlier return which is obtained, the increased chance of safety which it gives to the tender tubers to survive the season, and to yield a produce which may escape the scourge next year. In planting potatoes now, it is indispensable to dry them in the sun, and even to green them so as to enable the tubers to resist decay. The practice is not a new one, having been followed for many years in the district of Fingal for the purpose of supplying the Dublin market at an early season. It has received the sanction of Professor Lindley, whose authority in such matters is very great; and it has been practically tested and approved of by eminent agriculturists, among whom it may be sufficient to mention Mr. Grey, of Dilston, who has found that there is an actual increase of one-third in the produce of autumn-planted potatoes over those which are planted in spring. It is a matter of common observation, that potatoes which have remained in the earth during the winter, are found to be in a sound state when the land is ploughed up for other crops in the spring. The advantages of early planting are certainly due to a considerable extent to the careless mode of preserving our stored-up tubers till spring. We have been accustomed to view the potato as a plant which will grow anywhere, and keep under any circumstances. We have treated it in the most rude way, both in its cultivation and preservation—in a manner much more rude than we have dared to employ towards any other field crops. During the last few years the potato has begun to rebel against this cruel treatment; its sets have rotted in the ground and refused to grow as usual, and it has alarmed growers with the apprehension that it is about to forsake them altogether. Undoubtedly it will do so in course of time, unless it receives more tender treatment at their hands, unless it is stored with the same care as to ventilation and dryness which we give to our other crops, and receive somewhat more of attention in its cultivation. Our old mode of pitting potatoes is in every way reprehensible; and it is only wonderful—shut out as they have been from air, exposed to moisture and decaying emanations,

covered over with damp coverings of clay, through which no air could penetrate—that their vital vigour has lasted so long as, year after year, still to supply us with food. It is because the conditions in which they are placed under ground are more favourable to their after-development than that to which they have been exposed in pits, that autumn-planted potatoes have yielded a grateful return for their kinder treatment. Now, when we consider that it is impossible at once to ascertain whether those who have been accustomed to behave to their potatoes thus roughly will at once follow more kindly modes of treatment, it is certainly advisable to encourage the planting of potatoes *now* if the weather prove favourable for doing so, rather than allow the weak tubers of the present year to perish under the rough usage which their hardy ancestors were unable to bear.

Whole tubers planted now will certainly have a better chance than cut sets to struggle against the dangers which still beset them. But, at the same time, it must not be forgotten, that in planting the whole tubers we are sacrificing much which might be useful for seed in a time of scarcity. The buds or *eyes* have each of them the power of producing new plants, some more quickly and vigorous than others. It is an acknowledged fact in practice, that tubers imperfectly matured grow plants more vigorous than those produced from the fully ripe potato. Owing to this circumstance, the upper or youngest eyes of the potato yield a crop nearly a fortnight sooner than that grown from the under eyes. The middle eyes, in the same way, may be made to produce an intermediate crop. The separation of these are niceties not usually introduced into practice, but which may become necessary on occasions like the present. Any scarcity of food may be met to a considerable extent by forwarding the growth of our crops next year. Suppose, then, that we select early varieties for planting, and that we use the top eyes for our earliest crop, or plant the small tubers whole *now* (in which case the crown eyes will grow to the exclusion of the rest), we may obtain early crops to come in aid of any expected scarcity. An opinion some time since prevailed that we were to look to foreign countries for our seed potatoes. But consular returns have shown us, although commercial enterprise may furnish a good supply from Galicia and Bordeaux, still that when we consider the immense amount which would be required for new seed—800,000 tons for Ireland alone—it is obvious that this importation would only very partially relieve our exigencies, and that to a great extent we must depend upon our own resources. Now it very fortunately happens that we may obtain a very large provision of seed from potatoes used for domestic consumption,

without to any serious extent diminishing our supply for that purpose. If the eyes be preserved along with a small part of the potato to serve as nutriment for the young plant, they may be planted in spring and will produce plants as well as the tuber. This is no mere theoretical opinion: it is a practice constantly followed out in Canada and Brussels, and has been experimentally tested by various persons in this country. The mode of extracting the buds is exceedingly simple: the crown may be cut off to the depth of a quarter of an inch; and the single eyes may be removed by a scoop, of which a drawing is presented in Fig. V. A very

Fig. V. Representing the scoop for removing the buds or eyes of potatoes.

Actual size.



little practice with the scoop makes the operator expert: it is first pressed down firmly over the eye, and then gradually turned round so as to scoop out all the ring marked by the pressure. The eyes thus removed should be shaken in a bag with a little lime so as to dust them over with this substance; and, after lying exposed to the air for twelve hours until a skin forms upon them, should be packed up in perfectly dry wood ashes, peat ashes, or other very dry materials; when spring arrives they may be planted. By this simple operation a prodigious quantity of seed may be preserved for next season

without diminishing to any material extent the daily amount of food. Of course it is intended that the operation should be performed just as the potatoes are about to be used for the domestic supply.

It becomes an important question as to how far it would be safe to plant diseased potatoes. In the first place, it is undoubted that they will germinate and produce apparently healthy plants; but it is equally certain that there is a risk of their rotting in the ground before the formation of the young plant. It would be highly imprudent to plant diseased potatoes when sound ones can be procured; but, in the absence of these the farmer may be inclined to run the hazard. If the young plants be produced, I have little apprehension for the communication of the disease; for even on the fungous view of the malady, it does not follow because germs of fungi are present that they should be developed. However, it must be recollected that very eminent authorities are of a contrary opinion, and believe the experiment to be in the highest degree dangerous, and therefore the practice must not be rashly entered upon.

Connected with this subject, it is worthy of consideration how far land which has grown potatoes this year is likely to be dangerous for crops in the succeeding seasons. On this point also, there are various opinions; but, for my own part, believing fungi to be the consequence and not the cause of the decay, I do not apprehend any serious result. It is quite true that seed immediately sown upon land abounding in the decaying matter might become affected, and afford a soil upon which fungi might vegetate; but exposure to the air by ploughing that land would destroy the decaying matter, and fit the soil for future crops. Any apprehended danger might also be entirely guarded against by treating the land with lime, which would not only aid in destroying the decaying matter, but also prevent the germs of fungi from vegetating. We must recollect that this scourge has appeared for three successive years in America, and an excess of caution is not reprehensible to prevent a similar calamity to this country.

I trust these considerations will be sufficient to aid you in the treatment of sound tubers both for storing and for seed, and I now proceed to another part of the subject.

The manner of treating diseased potatoes described in the last lecture applied only to those which were still fit for human food. Those which are not fit for domestic use must be treated in a different manner.

Much alarm has been created by persons ignorant of the action of organic poisons as to the injurious effects which may arise from giving diseased potatoes to animals. The disease produces no specific poi-

son, and the only possibility of injurious effects from their use is that they might act in the same way as other decayed matter. Well attested instances are certainly on record of the communication of loathsome disease to persons who have partaken of decayed sausages or putrid bacon. But in every such instance of disease the decayed aliment has been partaken of in a cold state, and long after the substance has been exposed to the action of heat. As the injurious qualities of such organic substances are not due to any specific compound, but merely to their *state of decay*, we know with certainty that the progress of decay is stopped by exposure to the heat of boiling water. If, therefore, the diseased potatoes be given to an animal shortly after being boiled, there need not be the slightest apprehension of danger. In fact, M. Bonjean, of Chambéry, has completely set this at rest—had any doubt ever existed. He lived for several days on boiled potatoes, which had been thrown away as refuse, and drunk 8 oz. of the water in which they had been boiled—water sufficiently bad, for he describes it “of a yellowish brown colour, turbid and thick, of a slightly disagreeable smell and nauseous taste, leaving a bitter impression on the palate which lasted for several hours.” With the boiled potatoes, M. Bonjean perceived no unusual effect: the water, however, produced “a disagreeable burning sensation in his chest which lasted for a few hours;” but this experiment was altogether unnecessary, and there is no such risk in ordinary cases. Although the Irish Commissioners never doubted the safety of giving diseased potatoes to animals, after the tubers had been boiled, they fed pigs and a cow on tubers in a very advanced stage of decomposition without observing the slightest prejudicial result from doing so. It is quite true that potatoes actually putrid have produced disease in the lower animals; and I have received documents from Dr. Buckland referring to a case in which pigs were thus poisoned, but in all these cases the potatoes were given raw and not boiled. The diseased part of the potato contains an acrid bitter principle, which renders it of a disagreeable taste, and when it is intended for domestic use the affected portions should be excised, and the remainder, after being boiled, is still as good as before the tuber became tainted.

With the cut-out portions of potatoes used for human food, and with those diseased potatoes which are not converted into money by fattening cattle, we are enabled to save a great proportion of the nutritious matter which remains.

Starch is the principal ingredient characteristic of the potato, but the quantity present in the tuber depends upon the variety. Payen has examined this subject, and the following tabular statement

of his results shows not only the proportion of starch, but also the produce of varieties grown on the same kind of land :—

Varieties.	1 cwt. Seed produced.	One statute acre produced.	100 parts contained		
			Water.	Starch.	Gluten and Fibre.
	Cwt.	Tons.			
Rohan	58	14½	75·2	16·6	8·2
Large yellow . .	37	9¾	68·7	23·3	8·0
Scotch	32	8	69·8	22·0	8·3
Slow Island . .	56	14	79·4	12·3	8·3
Legonzac	32	8	71·2	20·5	8·3
Siberian	40	10	77·8	14·0	8·2
Durillers	40	10	78·3	13·6	8·1

All of you are familiar with the process of procuring starch from the potato. It consists simply in grating down the tuber and washing it with water. The starch as shown in the previous lecture, is imprisoned within cells; and in grating down the potato we tear down the walls of the cells and liberate the little granules of starch. These are insoluble in cold water, and generally are not larger than the $\frac{1}{200}$ th of an inch in diameter; consequently, when we pour upon coarse cloth the grated mass stirred up and suspended in water, these small globules will pass through while the woody fibre and other constituents of the cell walls are retained on the cloth. The starch which has passed through still continues coloured by a little of the diseased matter, but this may be removed by three or four washings and depositions. This starch, after having been dried, may be preserved for any length of time.* The residual pulp remaining on the cloth contains still a large proportion of nutritious matter, which becomes easily putrid and occasions a considerable nuisance in the neighbourhood of large starch manufactories. In Paris the nuisance of this was so great, that endeavours were made to convert it into some practical use, and it was found that in this advanced stage of decomposition, it formed an admirable manure for land, especially when applied in the liquid form by irrigation. More lately it has been used for feeding cattle with good results; nor will this be surprising, when we remember that it contains all the insoluble gluten of the potato. An analysis of the dried pulp thus procured showed that it contains 6 per cent. of gluten, which gives it about

half the nutritious value of oats. Of course our great care should be to economise the greatest quantity of the valuable ingredients of the diseased potato. Now if the pulp can be freed from the disease in an easy manner, it would be in the highest degree culpable not to preserve it. It happens fortunately that the diseased part of the potato, when the tuber has not become much dried, is almost wholly soluble in water; or at least, which practically amounts to the same thing, that the parts which do not dissolve are so light that they may easily be removed from the sound matter by pouring off the water. This being the case, we can obtain almost all the really valuable portion of a diseased potato by simply grating it down and stirring it up with water. The diseased portions dissolve in the water, and the pulp and starch fall down together. The red-coloured water must now be drawn off, and fresh water again put on: this washing repeated twice or at most three times, gives a mixture of pulp and starch, which when dried and ground offers a meal similar in colour to oatmeal. Professor Liebig recommends a very good plan when oil of vitriol can easily be obtained: it consists in slicing the potato and immersing the slices in water containing enough sulphuric acid to render it very distinctly sour to the taste. The slices must afterwards be washed with frequent water, as the acid adheres very obstinately. The addition of acid to water is useful, especially when the disease has been much dried in. In most instances, even when water alone is used, it is not necessary to grate down the potato as we do in making starch: it suffices to cut it into pieces, in the same way as we slice turnips or potatoes for giving to cattle. The only evil attending the process now described is the removal of the soluble albumen. As the albumen is carried off in the water employed in washing, one-half of the really nutritious matter of the potato thus disappears; but when we pursue the common method of making starch and neglecting the pulp, the whole of the nutritious matter is removed, and we obtain only starch, which by itself is not fitted to support animal life.

Other processes for converting diseased potatoes into wholesome food have been recommended; and as one of them, viz., steaming has received the powerful support of Dr. Buckland, I shall allude to it in the first place. It consists in passing steam through a vessel containing potatoes until they are melted soft, after which the softened mass is to be rammed down into air-tight casks, which are to be covered with melted fat. The potatoes must previously be pared, the diseased parts being cut out, and these are to be preserved separately. A plan very similar to this is that proposed originally by Parmentier, of boiling potatoes after being peeled,

* I have thought it unnecessary to enter into any detailed account of the manufacture of starch, as this is now practically carried into execution in every part of the country.

crushing down the boiled potatoes and drying the mass.

It is quite undoubted that these plans yield a very excellent article of food, and they ought to be followed when circumstances admit of their being carried into execution; but I apprehend that they are not sufficient to meet the exigencies of the case, as far as regards the peasant. Every person knows how easily a boiled potato becomes bad and suffers decay. The housewife is so sensible of its liability to do so, that she often uses it as a kind of yeast. It is this tendency to decay which renders it necessary to preserve them in air-tight casks, and not only to pour melted fat on the top, but also over all the joints. If we had to deal with bushels of potatoes, this might be effected, but when we have to treat a considerable fraction of the produce of a whole country, such processes assume an aspect altogether different. At all events I know that the Irish peasant will not purchase casks and fat even if he had the money to do so. Parmentier's process also requires good casks, and is still more unsuited for the circumstances of the case, because in addition to the extraction of the diseased parts, and removing the skin of the potato, additional labour and expense is employed in the two fuels and apparatus necessary for boiling, and for drying—the latter of which operations is no easy task, from the glutinous nature of the material.

Another plan, attended with perhaps as little trouble as any, consists in cutting the potato into thin slices and drying them upon corn or malt kilns. In doing this, several precautions must be followed to secure success. The heat must be applied very slowly indeed, and should not be raised much above 100° until the end of the operation, because a hard skin is apt to form on the exposed parts of the slices and prevent the escape of water. It has been proposed, and the proposal seems to me to be a good one, that the slices should be allowed to dry in the air for some time, by being hung up like onions and afterwards kiln-dried. However, the latter must be carried to the point of thorough dryness, for partial dryness only increases the evil, because the heat destroys the vitality of the tuber and renders it more liable to decay. If the whole potatoes be partially dried by artificial heat so as not to raise the temperature sufficiently to injure the vitality of the tuber, I am assured by Mr. Warrington that they are capable of preservation. His experiments, however, have not been made on a large scale. Of course in all operations for economising decayed potatoes, that method is to be preferred which yields the greatest return with the least labour and expense. It is for this reason that I have coincided in the recommendation of the Irish Commissioners, that simple washing of the grated mass is the process best

adapted for the cottage. After the three washings described, the water may be poured off, and the mass collected in a coarse canvass cloth or towel, which is then put on a box or stool and the water removed by pressure. Very considerable pressure may be given by placing the end of a spade in the bar of a grate or in a nick of a tree, and the stool, upon which the towel containing the pulp is placed, below the broad part of the spade: the handle of the spade is then pressed downwards, and by this means a powerful lever is obtained, and the water flows out freely from the pulpy mass. It may then be mixed with half its weight of oatmeal and a little salt, and be at once converted into good palatable cakes on the griddle. The moist mass may also be dried and ground into meal. This substance, which may be called potato whole meal, can be used in making bread, soup, or pottage. It must be borne in mind that cold cakes or bread would be a miserable substitute to the peasant for hot potatoes: on this account soup or pottage ought to be given along with the bread, and this whole meal makes a very agreeable and economical soup, when mixed with some bacon or herring. At all events I can testify that I partook of an agreeable soup without knowing from what it had been made, and found on enquiry that it was made of this potato whole meal, a little bacon, salt, and pepper, and that the total cost of its production was 1½d. for five pints.

This leads me to the consideration of an important point connected with any expected scarcity. Should any such misfortune assail us, it is of the first importance that we should act advisedly and not ignorantly in our endeavours to alleviate it; and we can only do so by a thorough knowledge of the nature of different aliments.

In setting a steam-engine to perform daily work, we are well aware that there are two conditions to enable it to perform its duties. In the first place we must supply fuel to convert water into steam, and we must keep the engine itself in thorough repair, immediately repairing any failures in its piston, its cranks, or wheels, and seeing that all the parts are kept proportionally strong for the work to be performed. We know that the coal, which answers admirably for fuel, would be most inappropriate for the repairs of any damaged parts of the engine itself. Just so is it with the machinery of the animal frame. It requires fuel to keep it in action, and it requires material of a different kind to repair the damaged parts of the frame. The conditions of sustenance are therefore very different, and the kind of aliment depends upon the want to be supplied. For example, the hard-working man requires to be supplied freely with those materials necessary to build up his muscles,

for these are partially destroyed with each exertion. The labourer, who has much hard work to perform, must eat a very large quantity* of potatoes to get through that work, while a much smaller quantity by weight of oatmeal would suffice—the amount of true nutriment in each being in the proportion of 1.6. All food then has two distinct purposes—the formation of flesh, and the sustenance of animal heat. The substances in vegetables destined for the formation of flesh are perfectly identical with it in composition, and are known by the names of gluten, albumen, fibrin or casein; those which are suited for the support of animal heat are not at all similarly composed to flesh, and consists of starch,† gum, sugar, &c. Knowing these facts, it becomes a money question as to the value of particular kinds of food for the support of the frame. We know how much of flesh-giving principle each variety of food contains, and therefore we can at once estimate how much of each it will be necessary to consume to obtain one pound of real nutriment, and what the cost of that pound will be to the consumer. The following table is constructed on this principle, but as prices vary in different localities, these may be altered to suit the peculiar case: in the table, they are given at the rate at which the respective substances might be purchased in London under favourable circumstances.‡

Quantity of Food necessary to produce 1 lb. of Flesh, and the Money-Cost of its production.

	s.	d.
25 lbs. of milk furnish 1lb. flesh, and cost	3	1
100 „ turnips „	2	9
50 „ potatoes „	2	1
50 „ carrots „	2	1
4 „ butcher's meat, free from fat and bone, furnish 1 lb. of flesh, and cost.	2	0
9 „ oatmeal „	1	10
7 ¹ / ₁₀ „ barleymeal „	1	2
7 ¹ / ₁₀ „ bread „	1	2
7 ⁴ / ₁₀ „ flour „	1	2
3 ¹ / ₂ „ peas „	0	7
3 ¹ / ₁₀ „ beans „	0	6 ¹ / ₂

* An adult labourer must eat 14 lbs. of potatoes per day to get through a good day's work.

† When so much starch is being made from diseased potatoes, it must always be borne in mind that it is not *nutritious*, properly so to speak; that an animal fed upon it alone would die nearly as soon as if deprived of food altogether. It is fuel for supporting animal heat, and therefore forms an excellent addition to meal, flour, or peas.

‡ Of course each person will find some errors in the prices attached to the articles shown by his own experience, and he may correct them by the data given in the first column; the difference will, however, be merely relative, and not affect the gene-

The extremes shown by this table are very remarkable: for while it would require only 3 lbs. of beans to furnish 1lb. of flesh-giving principle, it would require 50 lbs. of potatoes or 100 lbs. of turnips to yield the same amount, at a cost four times as great. For supporting the animal frame, POTATOES CANNOT BE A CHEAP FOOD. In order to obtain from them the requisite quantity of nutritious principle, an enormous quantity must be consumed, and this to the loss of a considerable quantity of the other useful ingredients of the food. The excrements of Irish peasants contain an abundance of unaltered starch granules, which have passed through the body unchanged, without exercising their peculiar function in the support of animal heat.

The potato is a food well destined to support the heat of the frame, and admirably fitted as an *associate* of other aliments. It is with this view that the rich use it with meat, trusting to the latter for the formation of muscular tissue, and to the potato for fuel to keep up the heat of the body; and in such a mixture there is absolute economy. Let us look at the various kinds of food with reference to their value as fuel, and we shall perceive that the potato takes its proper rank. Such a table as the following is, however, a mere rough approximation, for the carbonaceous matter or fuel is of very various kinds, and some of them give more heat than others by their combustion. The table, therefore, must only be taken for as much as it is worth—a rough approximation to truth.

Table showing the Approximative Value of various kinds of Food as Fuel to sustain Animal Heat.

	s.	d.
4 lbs. of potatoes contain 1lb. of carbonaceous fuel, and cost	0	2
10 „ carrots, ditto	0	2
1 ¹ / ₂ „ flour, ditto	0	2 ⁸ / ₁₀
1 ¹ / ₂ „ barley-meal, ditto	0	3
11 ¹ / ₁₀ „ turnips, ditto	0	3 ³ / ₄
1 ¹ / ₂ „ oatmeal, ditto	0	3 ³ / ₄
1 ⁹ / ₁₀ „ beans, ditto	0	3 ³ / ₄
1 ⁹ / ₁₀ „ peas, ditto	0	3 ⁸ / ₁₀
2 „ bread, ditto	0	4
11 ⁹ / ₁₀ „ milk, ditto	1	5

It will be seen by this table that potatoes have now mounted to the head of the table as the least expensive material for furnishing fuel to keep up the heat of the body; although it was about the most costly for building up the frame, or supporting strength. Surely no further arguments are necessary to condemn the use of the potato as the sole food of a people, when it was obviously destined as

ral result. A very useful lecture on the money-cost of food has been given by Mr. Ransome at Manchester.

an accessory to other food. We must then admit the following conclusion :

THE POTATO USED BY ITSELF IS ONE OF THE MOST EXPENSIVE MEANS OF SUPPORTING THE ANIMAL FRAME; BUT IT FORMS A CHEAP ADDITION TO OTHER NUTRITIOUS ALIMENTS IN SUSTAINING ANIMAL HEAT.

This is a conclusion that cannot be controverted; and therefore we must consider—What is the cheapest mode of furnishing the greatest amount of sustenance in a time of scarcity. Let us look to the leguminous plants, peas and beans. Dr. Buckland has shown that peas formerly constituted an important part of the diet of the people of this country—at a time, too, when our forefathers were more hardy than ourselves—and he has written strongly urging their more general cultivation for the sustenance of the poorer classes. He has been attacked by a portion of the press for this opinion—who have acted in this matter not less ignorantly or unjustly than the peasants in France, who pelted with potatoes the first man who endeavoured to bring them into cultivation in that country. Peas, beans, or lentils, are undoubtedly the cheapest means of supplying nutritious matter, which they furnish at one-fourth the cost of the potato. Their value has been known from the very earliest time;* and before the introduction of potatoes they formed a staple article of food among our soldiers and labourers, and were not then banished from the tables of the wealthy.† It is true that, when used alone, they are apt to cause flatulence, from the simple reason that they contain a superabundance of flesh-giving principle, which, not being wholly assimilated, enters into putrescence, and gives rise to the gasses productive of flatulence; but I am arguing against the exhibition of any one variety of food. Peas mixed with a proper quantity of potatoes would not produce flatulence, and the mixture would yield about the cheapest possible nutriment. Even the cereal crops—oats, wheat, and barley—offer a nutriment cheaper than potatoes; and if mixed with the latter, in a dietary would afford a cheap means of sustenance.

If these views be just it becomes a matter for very grave consideration, whether we should ever again devote so much land to the cultivation of potatoes as we have hitherto done. It has been proved that it is *not* a cheap mode of sustaining a population; physiology and experience both point to a variety of food as best suited for the maintenance of health and strength; and the history of

* The pottage for which Esau sold his birthright was made of lentils.

† In Holinshed's Chronicle is the passage—"A large mouth, in mine opinion, *and not to eat peasen with ladies of my time.*"

the past teaches us that variety of aliment is important in relieving the community from the dependence on two or three sorts of food, and the casualties attending their growth. In this last—the economical point of view—the question is of the highest importance; for whatever agricultural science may do to mitigate the effects of seasons or casualties on our crops, there are always evils attending the dependence on one or two kinds of food. Thus, it causes an unusual demand for labour at a particular period of the year, as in the case of harvesting the cereal crops, and leaves the labourers unemployed in the intervals. This, in the case of the Irish peasants, whose skill and industry is applied to the cultivation of one root, has the effect of reducing the value of both. There is not sufficient use for the intellect in its direction to practical and industrial skill, and there is no motive for acquiring habits of steady labour. The more extensively that we cultivate a variety of vegetables, the more that the various capabilities of our soils are developed in their proper direction, the more will labour be steadied and equalized, our markets be freed from those shocks attending the casualties of a single crop, and our population relieved from the dread consequences of famine. Why is it that in England we do not win those favours from nature in the variety of produce that afford such grateful food to other countries? Lentils contain the greatest amount of nutrition of any of the leguminous plants; they form one of the staple articles of the food of the labouring classes in other lands, and yet they are scarcely known in this. Rye is well suited to poor lands; it forms a nutritious bread, universally used in Germany and Hungary, better far than potatoes; and if it has not met the success in this country which it deserves, depend upon it the miller and baker are more to be blamed for the failure than bountiful nature. If, from their bulky nature, tubers are preferred by the poor, why is the Jerusalem artichoke forgotten, which of all plants yields the greatest return for the least amount of manure and labour. Frost does not injure the tubers of this plant; they may be left in the ground all winter, and just taken out as they are to be used. If a little piece of ground be devoted to them, they are so grateful for this privilege that year after year they will spring up without planting, because, however diligently we try to remove them, enough remains in the ground for next year's crop. This makes them inconvenient for rotation, but is an advantage in the cottage allotment. In fact, the Jerusalem artichoke is a most grateful plant, and will fully recompense us for any habitation, provided we do not give it a wet bed to lie in. We have also the parsnep, which

formerly was cultivated to a greater extent in Ireland than it is now. However, all these bulky plants should never supersede the cultivation of the cereals and the leguminous crops.

I am firmly convinced that the intelligent portion of this community have now the opportunity of converting the apparent evil of a failure into a great real and national blessing. They have the power to introduce the cultivation of more economical and useful crops, and in so doing to effect the social and moral improvement of the people. Should a scarcity unhappily arise, they have in their power to improve greatly our miserable cottage cookery by introducing a greater *variety* of viands, more palatable, healthier, and cheaper, because more substantial, though seemingly dearer than those now in use. We have thus the power of creating a permanent desire for better food, and this would give the greatest impulse to labour in Ireland. It is the absence of wants which in the first place so depresses a peasantry, and brings with it a train of evils arising from the non-application of skill and industry to gratify them.

Finally, if I have convinced you that it is most desirable, on economical grounds, to introduce a greater variety in the crops cultivated for the support of the labouring classes, and to diminish in extent the cultivation of potatoes, I would still further impress upon you the prudence of doing this in the present year. This is not the first malady to which the potato has been subjected. In Hanover, and in other parts of Germany, a disease broke out in 1770, and remained there till 1779, making its re-appearance in 1790. The dry-rot which attacked the potato in this country in 1832 did not disappear till 1840, luckily making but little ravages with us, but acting as a scourge in various German provinces. In America the same disease that now afflicts us has lasted for three years, and this year has again committed most formidable evil. There is nothing at all improbable in the belief that it may remain in this country for several successive years. We know that potatoes grown from the tubers inherit any peculiarities shown by their ancestors. This year circumstances have caused a feeble cellular tissue in all the potatoes throughout the country, similar, in fact, to what always exists in some of the tender early varieties. How do we know that, unless we have an exceedingly favourable season, this weakness of cellular tissue, which renders it unable to resist external influences, may not be imparted to the descendants of the present race, so that several years must elapse before it is again built up in its proper strength? And, in our ignorance of meteorology, who can say that such seasons as the last may not possibly be in store for us? I affirm none of these

things, because I am deeply ignorant of any laws of nature which would enable me to read these phenomena aright; but from the very conviction of this ignorance, I feel it would be presumptuous not to admit that such circumstances might possibly happen. I have confidence in the mercy of the Creator, but I know also that such afflictions arise often for our good. With this doubt and ignorance on a subject so hidden, I think it would be highly desirable to devote part of the land which hitherto has been under potato cultivation for the growth of leguminous plants, so that, should we be afflicted with this scourge in another year, we may lessen the force of the blow by a wise provision against its consequences.

I have now completed my task, very imperfectly I admit, but as far as I think I am warranted by the circumstances in endeavouring to lead you. I might have indulged theories and speculations, but this would have been worse than useless when we have to combat with a great practical evil. I have endeavoured to show you what is best to do at present, and what prudence points out as the proper course for the future; and, above all, I have been anxious to convince you that it now lies in your power to convert this national curse into a national blessing, and to make great good spring out of great evil.

BEART'S PATENT IMPROVED PIPE AND TILE MAKING MACHINE.

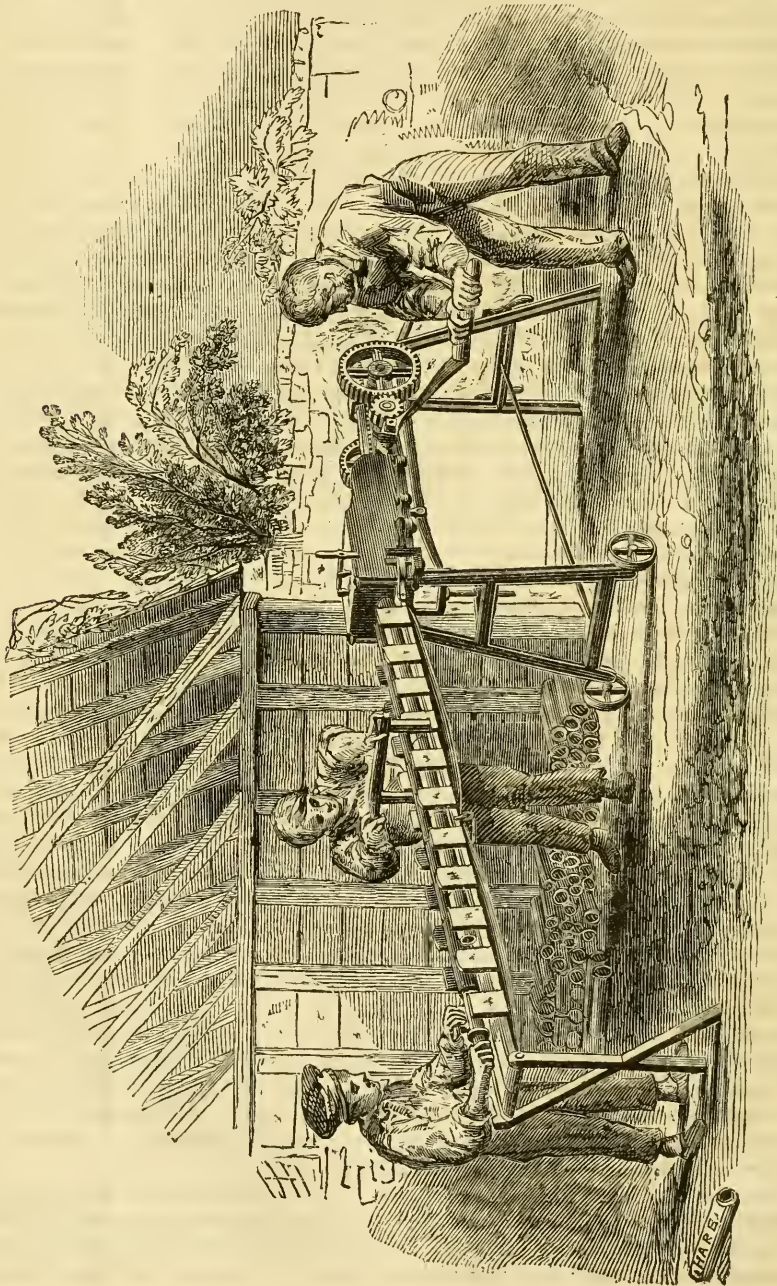
This gentleman, who is well known in the mechanical world for his many ingenious inventions and improvements, claims, and we believe rightfully, the credit of being the first to apply machinery to the manufacture of draining tiles. It is now nearly fourteen years since his first successful experiment was made, and the result is too apparent in the reduced prices, and consequent increased consumption, to require any illustrative remarks from us. If the honour of the first idea, or the practical development of it, belongs to him, we shall offer no apology to our readers for introducing the accompanying engraving of his machine as seen when at work, not because it possesses the charm of novelty so much perhaps as many others now in the field, but because it has maintained its reputation uninjured in the midst of a host of most respectable competitors, as an efficient and economical implement.

The construction and operation of this machine may be briefly stated thus:—It is about the size, and somewhat resembles in form an ordinary chaff-cutter; it is of iron, and of such strength as to

admit, without risk of derangement, any amount of power that it may be found requisite to employ in working the most tenacious, as well as washed or other clay, in a very much more solid or stiff state than could be moulded by hand; and which being less liable to shrink, make sounder and better tiles than those manufactured of soft clay. It also col-

lects the stones or other impediments so as to prevent the dies or grate from becoming choked. It can be filled with clay without removing any part of the mould, and is so portable that one man can move it wherever its services are required. With it, one man and two boys will make from 4,000 to 8,000 pipes or tiles per day of 10 hours.

PATENT IMPROVED PIPE AND TILE MAKING MACHINE.

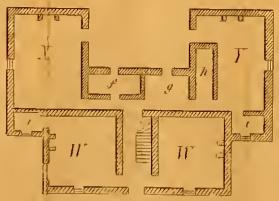
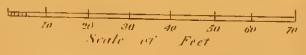
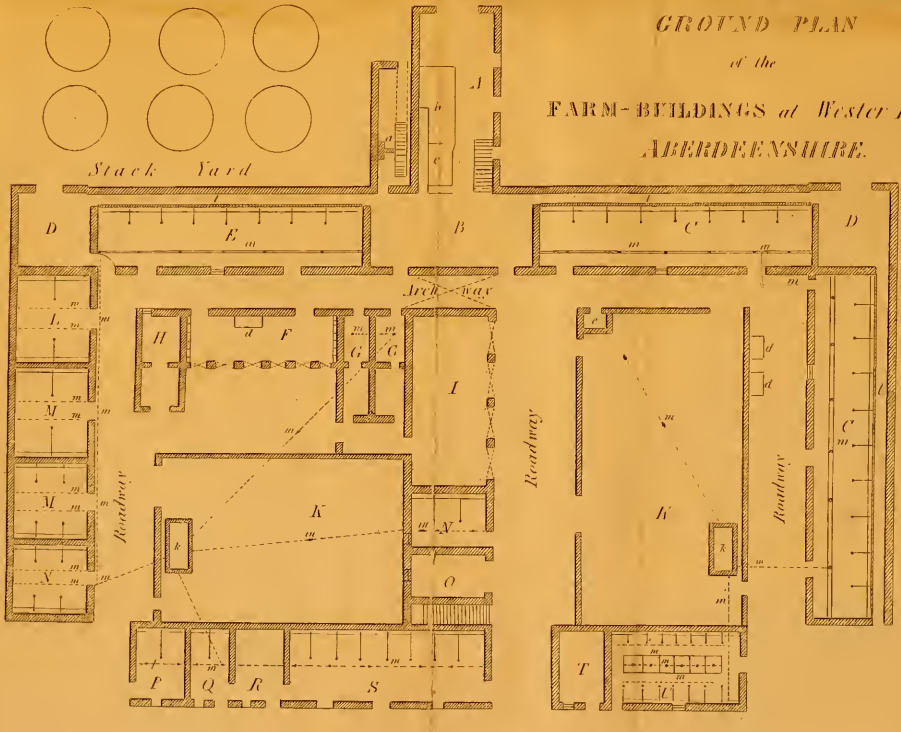


BY MR. ROBERT DEART, OF GODMANCHESTER, HUNTINGDONSHIRE.

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GROUND PLAN
of the
FARM-BUILDINGS at Wester Finlay,
ABERDEENSHIRE.



T H E G A R D E N

DESCRIPTION OF THE FARM-BUILDINGS,

AT WESTER-FINTRAY, ABERDEENSHIRE.

BY THOMAS SULLIVAN.

Much has, of late, been ably said and written with the view of drawing the serious attention of landed proprietors and agriculturists to the wretchedly defective condition and arrangement of the vast majority of the existing farm-steadings throughout the kingdom, and the absolute necessity of their immediate improvement. It is almost needless to observe that the construction of suitable and sufficiently commodious farm-buildings is a department of rural economy which has hitherto been sadly neglected in most parts of the country; indeed, in comparatively few districts has it received that degree of attention either from landlord or tenant, to which, from its great importance, it is so eminently entitled. There are, no doubt, several exceptions to this statement, as there is hardly any district that cannot boast of a few respectable homesteads; but even in those localities which are commonly regarded as the most advanced in the path of agricultural improvement, it must be admitted that, there still exists very ample room for amendment in this particular. As all parties now appear to be unanimous in regard to the advantage and necessity of furnishing every farm with a commodious, substantial, and conveniently arranged set of buildings, it is hoped that the following observations, principally descriptive of an existing steading of approved construction, may not prove uninteresting to the readers of this Magazine.

When we consider the rapid and lengthened strides that have been making for some time past towards perfection in most branches of husbandry, it must appear somewhat singular that agricultural architecture should have remained in so backward a condition as it unquestionably is, or that irregular, inadequate, and defectively arranged farm-steadings should be so numerous in all parts of the kingdom as they confessedly are. Agricultural implements and machinery have been brought to an unexpected degree of perfection; the different breeds of live-stock have also been wonderfully improved; while thorough drainage, subsoil-ploughing, manuring, and other important means of cultivating the soil and augmenting its productive powers, have been more or less generally adopted throughout the country; but it is apparent that the erection of farm-steadings, corresponding and essential to an improved system of husbandry, has not received similar attention, nor advanced in a proportionate

degree. This statement has been fully attested by many observant tourists. It is abundantly obvious, however, that properly constructed buildings are scarcely less essential to the profitable occupation of a farm, under a mixed system of husbandry, than ingeniously contrived labour-economising implements and machinery, or even the adoption of the most approved modes of tillage. In fact, the extension of improvements in agriculture, coupled with the increased area of cultivated land consequent on the breaking up of permanent pastures, renders a better order of homesteads absolutely indispensable, inasmuch as the augmented productiveness of the land furnishes the means of subsistence for an increased number of animals, which of course require enlarged accommodation. It is, moreover, incontestible that the high feeding and fine breeding of our live-stock, which are now so much attended to, have already rendered them more liable to diseases of a certain character, arising in a great degree from confinement, during several months of the year, in inadequate houses imperfectly ventilated, and subject to the pestilential effluvia generated by the decomposition of the excrements, which are too frequently permitted to accumulate to such an extent as to prove highly deleterious to the animals. Abundance of nutritious food is by no means the only requisite towards insuring the speedy fattening of stock, or their maintenance in a healthy, thriving condition during the period in which they occupy the houses; a sufficiency of pure, uncontaminated air, and clean, well-ventilated apartments are likewise absolutely essential. But the proper accommodation of the domestic animals, though certainly the primary object, is not the only advantage accruing from sufficiently commodious and conveniently arranged farm-buildings; as there are various other purposes to be served by a set of offices where the mixed system of husbandry is pursued, as I shall have occasion to notice in a subsequent part of this paper; and economy of labour in supplying the stock with food and litter, with other obvious particulars, must likewise be duly studied in determining the most proper and convenient disposition of the several apartments of the homestead.

The vast importance of providing suitable farm-buildings to enable the tenant to preserve, prepare, and consume the produce of his land with the greatest advantage, as well as to maintain his live-

stock with comfort to the animals and profit to himself, is so self-evident, and indeed so universally admitted, that it would be quite superfluous to enter further into details in order to illustrate the many benefits and conveniences that accrue to the farmer from the possession of a judiciously arranged and sufficiently commodious steading. There cannot, in fact, be a better criterion of the state of agriculture in any district or country, than the character and condition of the farm-buildings. Still, however, as it is hardly necessary to remark, well constructed steadings are, from various causes, comparatively rare throughout the country. This great desideratum is certainly attributable in not a few instances to the parsimony or negligence of non-improving, non-encouraging landlords, whose duty it unquestionably is, to furnish every farm with suitable and substantial offices, especially where tenancy-at-will still prevails, notwithstanding its numerous palpable and oft-exposed disadvantages. When the task of erecting the steading devolves on the tenant, the want of sufficient funds in many cases, and the comparatively temporary interest which he has in the farm, even under the longest tenure commonly granted, generally and very naturally—I had almost said, properly—prompt him to sacrifice permanency and commodiousness in the buildings, in order to diminish the immediate expenditure. But it is certainly, I think, an exceedingly mistaken economy, and so it must eventually prove, to erect a homestead in any other than a substantial, commodious, and convenient manner at the outset. Hence it becomes incumbent on the proprietor in almost every case to defray the expense incurred in the construction of farm-buildings; and we find this to be the uniform custom in the more advanced parts of the country, and those, too, in which the tenant enjoys the security of a lease of moderate duration, namely for nineteen or twenty-one years, according to agreement. The farmer undoubtedly derives incalculable benefit from the possession of a suitable and convenient homestead; but still his interest in it is merely temporary; whereas substantial buildings of approved construction, such as none but the landlord could be expected to erect, not only enhance the immediate value of the farm to which they are attached, but unquestionably constitute a permanent improvement, and realize a permanent increase of rent.

But even when neither of the causes referred to can be said to exist or operate—when the proprietor, or the tenant, or both conjointly, cheerfully and liberally expend an adequate sum in erecting what is expected to constitute a suitable and substantial steading, the intention sought to be carried out is not unfrequently frustrated by adopting an injudicious arrangement or disposition of the several

offices. This is, no doubt, in very many instances owing to the reprehensible practice of entrusting the designing of farm-steadings exclusively to architects, who, however eminent they may be in their own profession, cannot be expected to be competent to the important task of planning buildings for the accommodation of live-stock, and various other purposes, in the most judicious and convenient manner. The proper disposition and construction of a steading obviously require an amount of practical knowledge and experience in the designer, which none except those thoroughly acquainted with the minutiae of farm-management, and the requirements of the different species of live-stock, can be expected to possess; and hence the many serious blunders that are sometimes committed by even eminent and skilful architects in planning and erecting homesteads. There are no doubt several exceptions, and far be it from me to intend this passing remark as a sweeping condemnation of so respectable and intelligent a class of men; but nevertheless, I believe it may be regarded as incontrovertible that the vast majority of the steadings designed solely by architects unacquainted with the various purposes for which farm offices are required, or the details of practical agriculture, are defective in some important particulars; convenience and adequate accommodation being too frequently sacrificed for the sake of external appearance, compactness, and sometimes for what I am inclined to regard as mistaken economy. Symmetry and neatness of design are, however, perfectly compatible with such a disposition and construction of the several apartments as will afford ample accommodation, conduce to the comfort and health of the animals, which ought to be the primary consideration, and economise labour in supplying them with food and litter. It would not be a very difficult task to advert here to some of the defects observable in many of the existing and even recently erected and proposed steadings; but no great advantage would perhaps be gained by adopting such a course; and my remarks will, I think, be more likely to serve a useful purpose by being restricted, as they chiefly will, to a description of a farm-steading whose general arrangement accords with the most approved principles, and which has been found most advantageous in connection with the system of husbandry pursued—one, in short, that affords ample accommodation for a very large number of excellent stock of every description, and has been found well adapted to the various purposes for which farm buildings are commonly required and erected.

The newly-erected farm-steading, at Wester-Fin-tray, Aberdeenshire, a ground plan of which is attached to this Magazine, was designed by the en-

telligent and enterprising tenant, Mr. James Walker, who, I may observe, is among the best agriculturists, and most successful breeders of black cattle in the North of Scotland; particularly the polled Aberdeenshire breed, for which he has acquired much and well-merited celebrity. The buildings were not only planned by himself, who best knew what offices and accommodation he required, but entirely completed under his own superintendence, without the aid of any professional architect. Although this steading is not, perhaps, altogether free from defects, yet it will, I think, be admitted to possess comparatively few. The offices are all well ventilated, and afford ample accommodation for the numerous stock maintained on the farm; and it is not too much to say that the whole constitutes one of the most extensive, substantial, and complete farmeries to be met with, not merely in Aberdeenshire, but in the North of Scotland; which, it is well known, abounds with good steadings. The suitability or unsuitability of the buildings which I am now about to describe must evidently, however, be judged of in connection with the extent of the farm on which they are erected, as also with the system of cultivation and the general management of live-stock adopted thereon. A very few remarks on these points will not, therefore, be irrelevant in this place.

Wester-Fintray, on the property of the Earl of Fife, is situated on the north or left bank of the river Don, twelve miles from the city of Aberdeen, and consists of upwards of three hundred Scotch acres, or about three hundred and seventy-five English statute measure. The land is of superior quality, all arable, and cultivated according to the six-course rotation of cropping, viz:—

First year: Turnips, potatoes, and other green crops.

Second year: Oats and barley or beare, sown down with clover and rye-grass seeds.

Third year: Grass, occasionally cut for hay, but most generally depastured.

Fourth year: Grass depastured by cattle.

Fifth year: do. do. do.

Sixth year: Oats after lea.

I give this rotation here merely to enable the reader at once to understand the system of husbandry, pursued without which he could not rightly estimate the number of live-stock which the farm is capable of maintaining, or the size of a steading calculated to afford them adequate accommodation. The number of black cattle which the buildings are capable of accommodating is about a hundred, exclusive of calves; but upwards of a hundred and twenty head are usually maintained on the farm during the summer months, the additional stock being purchased to consume part of the grass, and

again disposed of before autumn. There is also stabling for five pairs of work-horses, which are the number required for cultivating the farm, besides stables for young horses, &c., to be afterwards adverted to; and there are likewise, it will be observed, houses for calves, swine, poultry, &c., &c.

Before proceeding to notice the construction and dimensions of each of the offices separately, it will be proper to advert briefly to their relative disposition in the steading, and the conveniences and advantages that accrue from such an arrangement; but here I wish it to be understood that I am by no means desirous of holding up or representing the steading under consideration as a perfect model even for the farm to which it is attached, much less for general imitation; and in the course of the following observations I shall venture to point out what, in my humble opinion, appears defective in its arrangement; I feel confident, however, that it exhibits the general leading characteristics which ought to be attended to in planning and constructing every complete homestead, suited to the mixed system of husbandry, though, of course, different circumstances require various modifications. The buildings, it will be perceived by reference to the plan, stand nearly due north and south, a position which of course is always, if possible, to be secured in the erection of a farm-steading, and the advantage of which is too apparent to require any illustration.

The stack-yard, it will be observed, lies to the north of the steading, and is quite contiguous to the thrashing machine—a position which secures two important advantages: first, the stacks being well exposed to the influence of drying winds, the grain and straw are preserved in the best condition during the winter and spring months; and secondly, from its proximity to the barn, both time and labour are considerably economised in removing the corn to be thrashed. It may not be uninteresting to remark, that the stacks are arranged in regular equidistant lines, and built upon raised stands, supported by stone pillars. The frame-work is octagonal, and formed of timber, and the nine stone (granite) pillars—eight supporting the circumference, and one the middle—are each one foot nine inches in height, including the projecting cap on the upper extremity. These raised stands, or, as they are provincially designated, “stathels,” are found of incalculable benefit in preserving the grain from the depredations of vermin, and the bottom of the stacks from sustaining any injury by the dampness of the ground. The corn-stands with stone pillars, at Wester Fintray, are fifteen feet in diameter, and their construction has cost the tenant £1 5s. each, including workmanship and materials—a sum which their usefulness has amply repaid. I may

observe further, that the stack-yard is enclosed by a sunk fence, three-and-a-half feet in height, in order that the corn may receive the benefit of a free and uninterrupted circulation of air among the stacks.

Straw being the bulkiest article of food used in Scotland by live-stock of every description, and the only material employed as litter, it is obviously an important matter to have the building appropriated for it situated centrally in relation to the several apartments occupied by the stock. Accordingly it will be perceived that the *straw-barn*, B (see plate), occupies a central position in the range of buildings forming the north side of the steading, and has the cattle-houses on each side, an arrangement the propriety of which will be at once observed and admitted as facilitating the removal of the straw for the purposes of litter and fodder. Ready access from the cattle-houses to the straw-barn is a principle which ought never to be neglected or overlooked in the disposition of the various offices of the farm.

The farm-steading, at Wester Fintray, including road-ways, dung-yards, &c., occupies an area of a little more than two-and-a-half imperial roods, or rather above half a scotch acre. The stone employed in the mason-work is granite, a beautiful and very durable variety of which, it is well known, abounds in almost all parts of Aberdeenshire. The side walls of the stables S, and the whole of the south range of buildings, as well as those of the granary range included between the barn and stables, are twelve feet in height, while the walls of the byres and cattle-houses are eight-and-a-half feet from the pavement to the eaves. The thickness of the walls is in general one foot and a-half, but in a few parts it is one foot nine inches. The partition-walls are mostly one foot three inches in thickness. The roofs of all the buildings are exclusively covered with slates, which were obtained at Foudland-hills, Aberdeenshire. It will, therefore, be perceived, that the steading under consideration, unites permanency and commodiousness with considerable elegance of appearance.

It may, perhaps, be objected, that the stables and other buildings forming the south or front range of the steading are injudiciously situated, as tending in a great degree to intercept the solar rays in winter, when warmth is so much to be desired for the comfort of the stock in the yards; indeed, it is generally, and, as I think, very properly, recommended in the construction of farm-steadings to have the several offices so disposed as to form three sides of a square or quadrangle, open to the south for the purpose of admitting the sun's rays into the courts, which is an important matter during the winter and spring months. This is unquestionably the most judicious arrangement,

and it secures a very important advantage where cattle are principally fed in sheds and open yards; but by an inspection of the Plan, it will be perceived that in the establishment under consideration the stock are maintained in houses, and not in hammels or court-yards, as is the practice in some other parts of the country, particularly in the Lothians and south-eastern counties of Scotland, the only yard and shed being one at F, appropriated for young cattle; but this, owing to its position and distance from the stables (a dung-yard, K, intervening) is not excluded from the benefit of the solar influence even in winter, while being at the same time well sheltered from the north and east, which are the directions of cold, biting winds, snow, and drizzling rains.

It still remains a subject of controversy whether cattle fatten quicker or thrive better in open sheds with attached court-yards in which they enjoy perfect freedom of action, than in houses where they are tied up by the neck to upright posts; but it would be rather foreign to our present subject to refer in this place to the arguments that have been advanced on both sides of the question. When the yards or "hammels," as they are indiscriminately termed, are of a small size, affording accommodation to two or three beasts only, enclosed by high walls, so as to prevent the inmates of adjoining courts seeing or annoying each other, and well supplied at all times with dry litter, there cannot, I think, be any question that this system of feeding is more conducive than the other at least to the *health* of the animals; and experience, which, it will be allowed, is a safer and surer guide in this matter than the most plausible theory, has abundantly proved that the shed and open yard method, as above described, is the most beneficial as well as the most *humane* way of fattening cattle, especially in localities where straw is generally an abundant commodity; the shed system of feeding being peculiarly calculated to effect its conversion into dung. Still, however, the universal practice in Aberdeenshire, where, as is well known, a very considerable number of excellent oxen are annually fattened for exportation to the London market, is to tie up the animals in stalls during the feeding season. Young stock are likewise, in the majority of instances, maintained in a similar manner during the winter and spring months, though it is generally admitted that the latter at least may be very advantageously reared in open yards provided with covered sheds, to which the animals are at liberty to retire for shelter in unpropitious weather. Young horses and calves, especially the latter, ought also, perhaps, to be allowed the privilege of a yard; and if the farm-steading under consideration is defective or deficient in any particular, it is, I think, in consequence of not having sufficient court room

provided for young stock; but, as already remarked, this is a point in reference to which some diversity of opinion still exists among practical agriculturists; and the rigorous nature of the climate may in a great degree justify the exclusive adherence to house-feeding. Nevertheless, the almost entire absence of court yards for young cattle is, in my opinion, a great defect in the Aberdeenshire farm-steadings, however well arranged and constructed they may be in other respects.

Having thus adverted to the general arrangement of the farm-steading at Wester-Fintray, we now proceed to consider in detail the several offices of which it consists, their dimensions, construction, and adaptation or suitableness to the purposes which they are respectively intended to serve. In noticing the different apartments, I shall take all those of a similar kind in succession, and we may with propriety begin with the description of the

Barn.—In Scotland, as most of the readers of this Magazine are aware, corn of every description is stored after harvest in a stack-yard appropriated to the purpose, whence it is readily carried to the barn when required for threshing; and hence in the erection of steadings, neither the proprietor nor the tenant is obliged to incur the additional expense of constructing extensive and costly edifices for housing corn in the sheaf; and I would venture to say, that it would be well for English agriculturists, who still adhere to the antiquated custom of storing the greater portion of their grain crops in large houses or barns, to adopt the practice universally pursued north of the Tweed. The propriety of doing so, must appear obvious to every candid and unprejudiced inquirer, whether he consider the great expense incurred in erecting barns sufficiently commodious to contain any considerable proportion of the corn annually grown on even a medium sized farm, or the damage which the grain and straw very frequently and necessarily sustain in such houses.

The barn consists of three distinct and separate apartments, each of which is designed for a particular purpose. There is, first, the apartment for containing corn in the sheaf as it is brought from the stack-yard to be threshed; secondly, the dressing-barn, situated immediately under the former, in which the grain is received from the threshing machine, and where it is dressed and prepared for the market or otherwise; and thirdly, the straw-barn, in which the straw is received and stored for some time after it has been passed through the machine.

The upper-barn, besides containing the unthreshed corn as it is brought from the stacks, contains also the machinery for threshing. It extends over both the corn and straw-barns, and is entered at the end next the stack-yard by a door ten feet in width, the opposite ground being elevated to nearly the level

of the floor, in order to admit of the sheaves being readily conveyed to the threshing machine. As the floor is necessarily subjected to considerable pressure, the boards and joists are formed of the strongest and most durable wood. The breadth of this apartment is the same as that of the corn-barn underneath, to be presently noticed; and it is lighted by two *luffer-boarded* windows in the east side wall.

The *corn or dressing-barn* A contains two pairs of fanners, the one at c being permanent, and worked by means of a belt, by the same power that propels the thrashing apparatus; the other is movable, and driven either by means of a belt from a part of the machinery, or by the hand, as may be found most expedient.

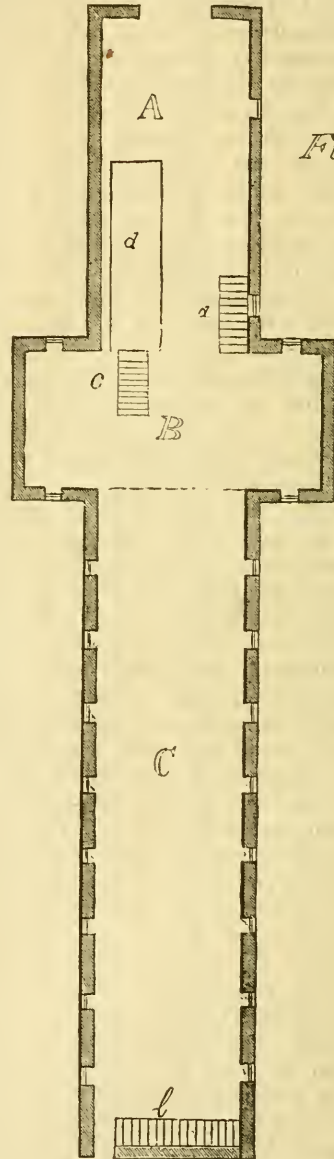
The *chaff-house* (B) is merely a portion of the under barn separated from the rest by a wooden partition. The corn-barn including the space occupied by the fixed winnowing apparatus, and that portioned off for the chaff-house is forty-five feet in length and nineteen feet in breadth. The roof is formed of the floor of the upper barn, and the height is nine feet two inches. This apartment is divided from the adjoining straw barn by a wooden partition, in which are two doors. It is lighted by two glazed windows in the east side wall, each three and a half feet square, between which is the door four feet in width, opening to the outside. The stairs represented in the Plan lead from the corn-barn to the upper barn, and from thence to the granary, which extends from the loft over the straw-barn to that of the work-horse stable S over the cart-shed (I,) and other intermediate offices. Underneath the stairs, on the floor of the corn-barn, is a small apartment enclosed by a wooden partition, in which the operation of churning is performed; motion being communicated to the apparatus by means of a belt passing from the other machinery. The threshing machine, fanners, &c., &c., are propelled by water-power, an adequate supply of which for this purpose is found to be of immense advantage and convenience to the tenant. There are two large dams at a short distance from the steading, for the purpose of collecting the requisite quantity of water, which is conveyed through the stack-yard in a covered *conduit*, and, after imparting motion to the mill-wheel, is carried off underneath the buildings and the surface of the yards, &c., to a convenient outlet at some distance from the steading. The water-wheel A, by which motion is communicated to the thrashing-mill, and all the other attached machinery, is sixteen feet in diameter, and is covered by a slated shed, in order to protect it from the influence of the weather.

Before leaving the corn-barn it will be proper to

advert briefly to the threshing-machine, and some of its appendages. I shall not, however, attempt any detailed description in this place, as by doing so this article would be extended beyond all due limits. The machine requires the force of eight horses, being what is called an eight-horse power, and at the ordinary rate of working, when a sufficiency of water is available, about ten quarters of oats of average quality are threshed and dressed per hour. In connection with the machine is a hummeller, for removing the awns of barley and beare; an apparatus for crushing oats or other grain for the work-horses; and the churn, which has been already referred to. Motion is communicated to all these by means of belts and "journals," water being the original motive-power of all. The threshing-machine was constructed entirely new, simultaneously with the erection of the farm-buildings; and when finally completed with all its necessary appendages, cost the tenant no less than £180; but it is to be observed, that a considerable proportion of this sum was incurred in cutting and forming water-courses to and from the mill-wheel.

B is the *straw-barn*, which, as its name implies, receives the straw as it slides from the threshing-machine down the straw-screen, and in which it is stored for some time for the use of the stock. There are two doors four feet in width, communicating with the cows' byre C on one side, and the fattening houses on the other. This arrangement is exceedingly convenient, as allowing the straw used as fodder to be carried with facility along the passages before the animals' heads, and placed in the mangers as required for consumption. The straw required for fodder and litter in the courtyard H, and the other apartments occupied by live stock, is carried through the two doors opening towards the roadway. The straw-barn is divided from the cattle-houses on both sides by stone-and-lime partition walls, and from the corn-barn by a wooden partition. It is forty feet in length by eighteen feet in breadth, with a loft overhead ten feet in height, it being ten inches higher than the corn-barn. This apartment is certainly too limited for the large quantity of straw required for the stock maintained on the farm, which is often a source of much inconvenience. It is found of very considerable advantage to have this barn sufficiently commodious to contain two different kinds of straw simultaneously; namely, one sort for fodder and the other for litter; but the apartment under consideration is quite inadequate to this purpose, and under this impression the tenant is anxious to erect a supplementary shed for straw, which is to be an off-shot from the barn, and to stand parallel with the cows' byre C on the north

side. The floors of the last-named apartments, namely, the corn and straw-barns, consist of substantial boarding, supported by strong joists or sleepers, and is secured in the most effectual manner to prevent the entrance of vermin, and to preserve the wood from dry-rot and other injuries to which it is commonly liable in similar situations.



The arrangement of the granary and of the upper barn will, perhaps, be more distinctly understood by the annexed illustration—Fig. 1. The former, in which the dressed grain is stored, extends over the archway, cart-shed, young horse stable N, and gig-house O, to the left of the work-horse stable.

The granary is eighty-two feet in length by eighteen feet in width, and the roof ascends to the slates; the floor is formed of the requisite strength to sustain a large quantity of grain, and there is a neat "skifting-board" all round the walls, as also in each of the barns. The granary is lighted and ventilated by sixteen windows, eight in front, and eight in the back side wall, which are furnished with luffer-boards, so as to admit light and air to any extent that may be required. The grain is brought from the corn-barn by the wooden stairs at *a*; and when its removal from the granary for marketing or otherwise becomes necessary, it is conveyed to the carts by the stone stairs *b*, at the extremity adjoining the work-horse stable. A and B are the lofts above the corn and straw barns respectively, which are appropriated to the storing of the sheaf-corn immediately previous to its being threshed. The situation of the threshing machine is shown at *d* in the figure, the opening *c* in the left being for allowing the straw to slide down the screen to the barn underneath. The upper-barn is entered from the stack-yard by a door in the gable ten feet in width, and is lighted and aired by luffer-boarded windows, similar in size and construction to those of the granary.

Stables.—The work-horse stable *S* occupies a portion of the range forming the front or south-side of the steading; it is forty-eight feet in length, and contains eight stalls, thus affording a clear space of about five feet ten inches for each animal. The width of the stable is seventeen feet six inches inside measurement, which affords ample room for the manger, horses, passage, and harness, the latter being mostly hung against the front side wall. It is obviously a mischievous error, though one very commonly committed, to make stables for work-horses too narrow and hampered, the ordinary width seldom exceeding fifteen or sixteen feet, a space which is entirely inadequate to the purpose. Another equally prevalent and objectionable practice consists in forming the stalls over-narrow, it being rarely that even a width of five-and-a-half feet is allowed for each in work-horse stables. Many evils and inconveniences arise to both animals and ploughmen from the narrowness of stalls in farm stables. They should never, in my opinion, be less than the width given above, though six feet may be occasionally allowed with advantage. The side-walls of the stable, as well as those of the whole range of which it forms apart, are twelve feet in height from the pavement to the eaves; and the stable is furnished with a loft, eight feet ten inches from the floor, for containing the hay and straw used as fodder by the horses. A loft is commonly objected to in farm stables, and, as I think, very properly when the walls are low; but in the present instance, the

altitude of the building admits of abundance of room between the floor and loft for the purpose of ventilation. The manger and hay-rack, as well as the manner of binding the animals, being of the ordinary construction, need not be further adverted to in this place. The partitions of the stalls are formed of wood, and are eight feet in length; each horse has the privilege of a separate stall about five feet ten inches in width. The floor of the stable is paved or "causewayed" with small round stones, embedded in sand, which are found to answer the purpose exceedingly well, such a flooring being very permanent and easily kept clean, besides being comparatively inexpensive. There is a gutter *M* behind the horses' heels, for the purpose of conveying the urine to the liquid manure tank *k* in the dung-yard at the rear of the stables, which obviously is a much better plan than the usual one of having gratings in the centres of the stalls for allowing the escape of urine, such openings as the latter being always liable to be obstructed by the litter. The gutter is furnished with gratings at different parts, to admit the descent of the urine into the channel, and to prevent the entrance of any solid portions of dung. The floor of the stalls has a fall of three inches from the manger to the gutter, in order to facilitate the escape of the urine into the latter. The advantages accruing from this arrangement of the stables must at once be perceived. Not only is the urine thus preserved and employed as a most valuable fertilizer, but it is prevented from inflicting by its decomposition the most serious injury on the animals. The ammoniacal fumes generated by the decomposition of urine in stables are well-known to prove highly detrimental to the health of the horses, as affecting their lungs and eyes: indeed many fatal pulmonary complaints both in the horse and cow are ascertained to be directly traceable to confinement in filthy ill-ventilated houses, and the pestilential effluvia emanating from the decomposition of the dung and urine which are too frequently permitted to accumulate in stables and cattle-houses. The work-horse stable is entered by two doors, each four feet in width (one being at the gable, and the other at the front side wall), and lighted by two windows, the upper halves of which are glazed, and the lower provided with small shutters to admit an increased supply of air when necessary. The loft is likewise lighted by low windows in the front side wall, and there is a door in the gable for the admission of hay and straw, besides one communicating with the granary. In this stable are two corn-chests or "binns" for containing the oats used by the horses; and each chest is divided into two compartments, provided with lock and key, so that every ploughman has access only to the corn allowed for his own pair.

The stables are plentifully supplied with water brought in lead-pipes from a fountain at a short distance from the steading. The walls as well as the ceiling of the loft are neatly plastered and white-washed; and, in short, there is nothing a-wanting that could contribute to the health or comfort of the animals, which, of all others employed or maintained on the farm, are so eminently entitled by their usefulness to the most careful treatment and attention. But how very frequently do we witness the humble farm-horse subjected to the worst usage, not so much arising from severe labour or even insufficient food, as confinement in low, narrow stables, in which the dung and urine are often allowed to accumulate for several successive days, the decomposition of which generates large quantities of ammoniacal fumes, which eventually must prove most destructive to the health of the animals! The expired carbonic acid gas also is seldom enabled to escape from the stable by means of adequate ventilation, or to be displaced by pure uncontaminated air. And how, it may be asked, can it be expected that horses will thrive or maintain their health unimpaired for any length of time in such a vitiated atmosphere as that contained in stables so constructed and circumstanced?

P is a small stable, eleven feet in length, and containing two stalls, one being occupied by a stallion kept on the farm, and the other by the horse that ploughs in the same team with him during the winter and spring months. It is entered by a door in the gable, four feet in width, and lighted by a window in the front side wall. The adjoining apartment, Q, is a small stable containing two stalls for saddle horses; it is ten feet in length, each stall being nearly five feet in width, and has also a window two-and-a-half feet wide by three feet high, besides an entrance door: the stalls, floors, and roofs of the last two offices being exactly similar to those of the work-horse stable already described, need not be further adverted to in this place. The hay loft extends uninterruptedly over the entire building.

R is the room appropriated as the sleeping apartment of the unmarried male servants employed on the farm; it is twelve feet in length by eighteen feet in width, and communicates with the stables on both sides by means of two doors. There is also a door opening towards the road way in front, and a glazed window in the side wall for the admission of light and fresh air. The floor is neatly boarded, and the walls and roof properly plastered, so that upon the whole this apartment forms a very comfortable and convenient dormitory for the farm servants: its close proximity to the stables may perhaps be objected to, on account of the noxious effluvia which so commonly emanates from houses

of this class, and which may be supposed to find its way and extend its contaminating influence to the adjoining apartments; but, as already remarked, the stables are so arranged and constructed as to prevent the accumulation of any vitiated air, and, indeed, in the present instance, very little, if any, inconvenience is experienced by the farm servants from this cause; while, on the other hand, there are several advantages attendant on this position of their sleeping-room. Being in the immediate vicinity of the stables, the horses are conveniently groomed and fed both in the morning and at night, and any accidents that may occur are at once observed and attended to. There are several comfortable houses at a short distance from the steading occupied by the married labourers employed on the farm, to which are attached small gardens for the production of potatoes and vegetables. The unmarried servants have also another house, contiguous to the farm-steading, in which to cook their food; this latter apartment being what is provincially designated the "bothy."

N N are two stables for young horses, the one containing six, and the other three stalls. The former is 17 feet in length by 18 feet in width, the stalls being arranged transversely in the stable, with a passage 3 feet 9 inches wide behind the animals. The roof ascends to the slates, and the floor is paved with small round stones, in the same manner as that of the work-horse stable. The stable situated between the cart-shed, I, and the gig-house, O, contains three stalls, and is 14 feet in length by 18 feet in width. The roof is formed by the granary loft above, and there is a glazed window in the back side wall, 2½ feet wide by 4 feet high.

The adjoining apartment, O, is the *gig-house*, which is 10 feet in length by 18 feet in width. The floor is formed of flag-stones, neatly jointed together. The large door in front is 7 feet in width, and the window in the rear, for the admission of light, is 3 feet square.

Byres.—The next offices to which I shall advert are the cow-houses or byres, C C, one of which adjoins the straw-barn, B, and forms part of the north range of the steading, while the other constitutes the east side. The former is 60 feet in length, and 18 feet in width. It contains eight stalls, each of which accommodates two cows. The stalls are 8 feet in width between the partitions, thus affording 4 feet of clear space for each animal. There is a passage 3 feet 9 inches in width between the mangers and the back side wall, for conveying straw and turnips to the cows from the straw-barn and the root-house, D, at the junction of both byres. The mangers are placed nearly in the same level with the floor of the stalls, and are 1 foot 6 inches

wide at the bottom, and 2 feet at the top. They are formed of Caithness flag-stones, which are peculiarly adapted to such purposes; a strong curb-stone of granite, 6 inches in height, being placed in front, next the passage, and an erect flag of the same height next the stall, both being designed to keep in the straw and turnips used as food by the cattle. The partitions of the stalls are formed of strong Caithness flag-stones, 3 feet 9 inches in height, and extending the same length backwards from the manger. Between the stalls and the passage in front of the animals' heads are placed strong horizontal rails of wood, firmly attached to the upright partitions that divide the mangers. The floor and passages are paved with small round stones, imbedded in sand, in the same manner as the work-horse and other stables. There is a gutter, *M*, behind the animals' heels, furnished with gratings at proper intervals, for carrying off the urine to the liquid manure-tank, *k*, excavated in the dung-yard at the rear of the calves'-house, *U*. The floor of the stalls has a fall of 3 inches from the manger to the gutter, for the purpose of facilitating the escape of the urine into the drain, and thus preserving the litter comparatively dry. The passage between the gutter and the front side wall is 3 feet 9 inches in width, which affords ample room for the milking utensils, as well as for the byre-man in removing the dung and soiled litter. The gutter itself occupies a space of a foot in width, and has a gradual fall towards one end, in order to afford the urine ready access to the liquid manure drain through the gratings on the top. The entire breadth of the byre is thus divided into a passage of 3 feet 9 inches in front of the mangers, which latter occupy 2 feet; the stalls, 7 feet 6 inches in length; a gutter, 1 foot wide; and a passage behind the cows of 3 feet 9 inches in width. All the urine of this and the adjoining byre is conveyed to the tank, *k*, at the rear of the calves'-house, by the liquid manure drain, *m m*. As proper arrangements in byres and cattle-houses, for the preservation of urine, are much less attended to in all parts of the kingdom than the great importance of that valuable fertilizer demands, it may be useful to mention that the liquid manure drain is formed in a very simple and efficient manner by means of "cheeks" or flag-stones, placed about a foot apart at the top, and the opposite ones meeting at the bottom. Strong flag-stones, or "covers," are then laid across these, apertures being left at proper intervals for iron gratings. The "cheeks" meet so closely, both laterally and at the bottom, that a little Roman cement laid along the joinings most effectually prevents the escape of any of the urine. The drain is thus constructed in the form of an equilateral tri-

angle, having the apex undermost and the base uppermost. The space above the covers, or top of the drain, is paved with small stones, in the same manner as the rest of the floor, and formed into a concave channel or gutter, along which the urine flows to the next lower grating, where it descends into the drain.

The ceiling of the byre is, as it invariably should be, quite open to the slates, and furnished with ventilators at proper intervals along the summit, for the purpose of allowing the ready escape of the carbonic acid gas expired by the animals, while at the same time admitting an adequate supply of pure air. There are likewise, as a further means of insuring the same desirable object, several vertical apertures in the wall, directly fronting the animals' heads; but in very cold weather, or when the wind blows hard from the north and north-east, these narrow slits or openings are shut up. The side-walls of the byres and feeding-houses are 8½ feet in height, from the pavement to the eaves. In the inside they are neatly plastered; and the rafters and sarking* of the roof are carefully washed annually with lime-water, which is supposed not only to render the byres, &c., more salubrious for the stock, by the absorption of carbonic acid gas, but also the timber less liable to injury from various causes, such as dry-rot.

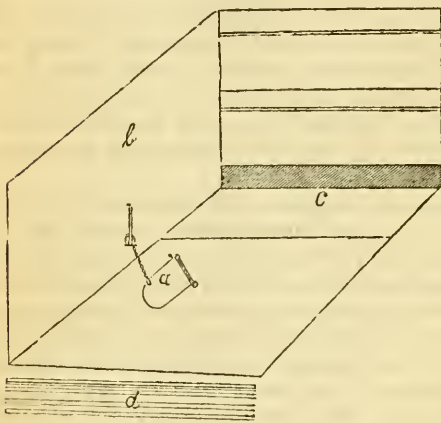
The manner in which the cattle are bound in the stalls seems deserving of some notice, as presenting a peculiarity not to be met with, so far as I am aware, in any other steading in the country. The binder consists of a bent piece of iron rod, furnished with a clasp, which admits of being very readily loosened and fastened by the byre-man, but cannot be opened by the animals themselves. This device, which I have endeavoured to represent at *a*, fig. 2, is 1 foot 3 inches in length by 10 inches in width, and formed exactly to fit the neck of the animal. The manner of attaching the binder, by means of a short chain, to the flags forming the partition of the stalls, will be better understood from the annexed sketch than from any verbal description. This sort of binder is much preferable to the iron chain which is commonly employed for the purpose, as being safer, more substantial, and less irksome to the animals. In the figure, *b* is the partition of the stalls, *c* the manger for turnips or other food, and *d* the gutter for the passage of urine.

The arrangement and construction of both the byres, *C C*, being similar in every respect except the dimensions, the foregoing description will suf-

* "Sarking" is the Scotch term for the boarding on the roof of a building, to which the slates are fastened.

fice for both. The byre which forms the east side of the steading is eighty-three feet in length, and contains ten stalls, each eight feet in width. This byre accommodates twenty cows, two in each stall, and the other sixteen. Each house has two doors four feet in width, opening to the roadway in front, besides the doors in the interior communicating with the straw barn and turnip-store; and there are two windows in the side wall three feet square. The cattle are supplied with turnips in winter and spring, and with green clover in summer, from the root-house D, which is common to both byres, as will be perceived by an inspection of the Plan.

Fig. 2.



The *feeding-house*, E, appropriated to the fattening of oxen for the butcher, differs but very little in construction from the cows'-byre C, situated in the same range of building; it immediately adjoins the straw-barn on the west side, being divided from it by a partition wall, in which is a door for carrying the straw used as fodder along the passage *l*. This apartment is of precisely the same length as that on the opposite side of the straw-barn, and accommodates the same number of animals, namely sixteen. The floor, roof, stalls, &c., being in every respect similar to those of the cows' byres, need not further adverted to in this place. The cattle in this house are supplied with turnips from the adjoining apartment D, at the west angle of the north range, conveyed in a wheel-barrow along the passage before the mangers. This feeding-house and one of the byres are, therefore, very conveniently situated between the turnip store at one extremity, and the straw-barn at the other, the advantages of which arrangement must be at once perceived.

F is a *shed* with an open court-yard for young stock, the roadway intervening between it and the

feeding-house being nine feet in width; it has six arched entrances from the yard for permitting the entrance and egress of the animals at pleasure. The stone pillars are two feet square, and the intervals are each five feet; there are besides, two doors opening towards the roadway, by which straw and chaff are supplied, the latter being the principal article of fodder used by the young cattle during the winter months; and the proximity of the yard to the barn admits of its being readily removed thither from the chaff-house. There are a few moveable racks placed in the open court, for containing the fodder; and permanent ones fixed to the walls in the interior of the shed. At both ends of the shed are troughs for turnips, fitted up against the walls; there is also a water-trough *d*, supplied with fresh water at all times by a lead-pipe from the fountain. The open court-yard is thirty-seven in length by twenty feet in width, and is divided from the dung-yard, K, by a stone and lime wall, one foot two inches in thickness, and four feet in height; this shed and yard are capable of accommodating from ten to fourteen head of young cattle in a comfortable manner. There is a gateway nine feet in width, for the entrance of carts to remove the dung when it has accumulated in the court or shed to an inconvenient height.

H is another small shed, with a corresponding court-yard for a bull; the shed being eleven feet in width by nine feet in length, and the yard nine feet square, enclosed by a wall of stone and lime four feet in height. There is a small door in the wall facing the roadway, for supplying turnips; and a gateway four and a half feet wide, opening into the yard, for removing the dung and adding fresh litter from time to time. A small shed, such as this, exclusively for a bull, may be regarded as an indispensable part of every extensive farm steading, though many are destitute of this convenience.

L is an auxiliary feeding-house for oxen, and is twenty-two feet in length by eighteen feet in width. It contains four double stalls arranged transversely in the house, and each accommodating two animals. The partitions of the stalls are formed of wood in the usual manner, and need not therefore be described in this place. The floor is paved with small round stones, and the roof ascends to the slates, as in the other cattle houses. There are two gutters for conveying the urine, as soon as it is voided, into the liquid manure drain, which passes to the tank exterior to the front side wall. The space intervening between the gutters is three feet nine inches in width.

M M are two houses, in the same range as the last for young cattle; but that immediately adjoining the feeding-house L, which is of similar size and construction, may be, and indeed often is, occupied partly by working, and partly by fattening oxen,

as may be found most expedient, the size and arrangement of the stalls admitting of either purpose. In the apartment adjoining the young horse stable N, there are six stalls placed transversely, with mangers in front on the same level as the floor. The length of this house is nineteen feet; and it accommodates twelve animals. Both these offices are exactly similar, in the floor, roof, and stalls, to the feeding-house L, already referred to.

The *piggeries*, G G, are situated between the young-cattle shed H, and the cart-shed I. Each consists of two apartments, the one adjoining the roadway being a roofed shed supplied with litter for the swine to sleep in, and the other an open court with a flagged floor, in which are placed troughs for containing the food. The shed, or "sty," as it is more frequently termed, is eleven feet in length, by seven feet in width, and has a door opening to the roadway for supplying litter when required. The open court is exactly of the same dimensions and area, and has also a door for supplying food to the pigs. There is a door, four feet in width, from the cart-shed into the open area in front of the piggeries, for conveying food from the kitchen; and another larger door opening into the young cattle's court for removing the litter that has been impregnated with the excrements of the swine; there is likewise, it will be perceived, a liquid manure drain for conveying all the urine, not absorbed by the litter, to the tank *k*, in the adjoining dung-yard, as denoted by the dotted line *m*, passing beneath the surface of the intermediate yards.

The *Cart-Shed*, I, is forty-two feet in length and eighteen feet in breadth, within the pillars. The roof is formed by the floor of the granary over head. There are three stone-and-lime pillars, and four arched entrances: the former are each two feet square, somewhat rounded at the corners, to prevent accidents by the contact of cart-wheels; and the latter are eight feet in width. This shed is obviously of very considerable utility in preserving the carts from the action of the sun and rain; and no farm-steading can be considered complete without one of sufficient capacity, however commodious and conveniently arranged the several offices may otherwise be. The shed under consideration is capable of containing eight carts, together with some of the smaller implements and tools in daily employment. In the wall, immediately over the centre of the archways, are fastened hooks, to which one of the chains of each cart is attached, whereby the shafts are elevated above the floor, when not in use. There are several other purposes which a commodious cart-shed may occasionally be made to serve, such as steeping or pickling wheat preparatory to sowing, cutting potatoes for seed, &c., &c.; and a necessary precaution is to have the shed directed

from the south, so as not to have the carts exposed to the drying and shrinking effects of the sun's rays. An opening towards the north or the east is therefore to be secured, if possible.

K K are the *manure yards*, in which are preserved and accumulated the soiled litter and the excrements of the various animals fed in the houses. Each is separated from the adjoining roadway by a stone-and-lime wall four feet in height, and one foot two inches in thickness. There are gateways, nine feet in width, in convenient positions for carting out the dung to the fields when necessary, and narrower entrances for admitting the litter and the solid excrements by a wheel-barrow from the stables and cattle-houses. The bottom of the dung-yards is so contrived as to prevent the escape of any liquid drainings from the manure.

In the corner of the dung-yard opposite the cart-shed is situated the *necessary* or *privy* for the labourers and servants employed about the establishment. The valuable contents of this "necessary" apartment are turned to good account as manure, by being mixed occasionally with absorbent matters.

In each dung-yard, and contiguous to the roadway, is a liquid manure-tank *k*, in which are collected and preserved all the urine and other liquid matters of the farm-steading; none being permitted to run to waste, as is too frequently done in most parts of the kingdom, notwithstanding the powerful efficacy of this now well-known and most valuable fertilizer. These tanks are each twelve feet in length, six feet in width, and eight feet in depth; and, consequently, contain about 3,580 gallons of urine, or, both together, 7,160 gallons. In consequence of the subsoil being of a very tenacious character, it was deemed unnecessary, in the formation of these tanks, to build the sides with stone and lime, or with bricks, as is generally done in the construction of similar receptacles, the sides of the excavation having been considered sufficiently adhesive and retentive to prevent the escape of any of the liquid. The tanks are of a rectangular form, and covered with an arched roof of masonry, in which are inserted cast iron pumps for the purpose of transferring the contents, from time to time, to the liquid manure cart, by which the urine is conveyed to the grass fields or other place for application. The liquid manure drains, by which the urine from the stables, byres, cattle-houses, piggeries, calves' house, &c., passes to the tanks, as well as those through the dung-yard for collecting the surplus drainings, are represented in the Plan by dotted lines.

The greatest advantage has accrued at Wester-Fintray from the use of liquid manure, which abundantly confirms the highly fertilizing proper-

ties which this valuable substance is now ascertained to possess. It is generally applied to the pasture fields during the winter and spring months, when it is produced in great abundance by the numerous animals maintained on turnips and other food in the houses; and the effect has been already truly astonishing, the herbage being thereby rendered surprisingly luxuriant and verdant. The barest spots of the fields are selected for the application of the urine; and so immediate and powerful is its effect, that, in a comparatively brief period thereafter, those patches that had previously been the poorest and barest become by far the most productive. The liquid manure-cart employed consists of a puncheon mounted on the frame-work of an ordinary cart, and is furnished with a long, narrow, wooden box, affixed to the hindermost part of the frame, and perforated in the bottom to insure the equal distribution of the liquid over the surface of the ground. This very simple but effective apparatus can be readily detached from the cart, and allowed to remain in the field to which the urine is being applied.

T is the *Implement-house*, in which are kept the machines and larger tools not in constant employment, such as the turnip-sowing machine, &c. This apartment is likewise used as a repository for coals. It is entered from the roadway by a door four feet in width, and is lighted by a glazed window, three-and-a-half feet square.

The *Calves'-house*, U, it will be perceived, is very conveniently situated in relation to the position of the cows'-byre C, it being always desirable to have both these apartments as contiguous to one another as possible, for convenience in supplying the calves with milk. The calves'-house is thirty-one feet in length, and 18 feet in width. Along the middle of the apartment is placed a row of cribs, each four feet square, in which are placed the young calves immediately after birth, and in which they are afterwards regularly supplied with milk. The cribs are formed with wooden posts and rails, four feet in height; and the floor is paved with small stones, and furnished with a gutter and gratings for conveying the urine to the tank, and preserving the litter dry. Against the front and back side walls are arranged a series of small stalls, in which the calves are placed after they have attained the age of three or four weeks, they being then removed out of the cribs, and tied up in separate stalls, provided with a low rack for hay, and a small manger for cut-turnips. The passages between the cribs and stalls on each side, as well as the rest of the floor, are paved with small round stones, in the same manner as the floor of most of the offices already described, and furnished with underground drains and gratings for carrying off

the urine to the liquid manure tank. The stalls are divided by wooden partitions, and are each three and a half feet in width, there being fifteen in the house, exclusive of the cribs. The side walls are of the same height as those of the stables and other apartments in the south range, and the roof ascends to the slates, with the view of affording abundance of fresh air, which, it is needless to observe, is an important requisite in the calves' house. There is a window in the front wall three and a half feet square, besides two entrance doors, for the admission of light, which is also an essential requisite. The great advantage of a house thus fitted up with cribs and small stalls over loose boxes for calves, is that the latter are thus prevented from sucking each other, as they are frequently known to do, if permitted, after getting their allowance of milk—a practice which, if not timely observed and prevented would undoubtedly engender disease in the young animals.

The *Poultry-house* V will be perceived to be situated by itself a little to the east of the cow-byre, and apart from the rest of the steading. It affords all the accommodation and conveniences required in a house appropriated for domestic fowls. The several compartments are divided from each other by partitions of mason work; and the floors are formed by flag-stones neatly jointed together. The poultry-house has a southern exposure, which is an important advantage, as a considerable degree of warmth is known to be essential to the proper maintenance of domestic fowls, and there is a commodious yard in front enclosed by a stone wall four and a half feet in height. The houses are secured internally in the most effectual manner against the depredations of vermin.

I may here observe that work-shops for a smith and a carpenter are not provided in this steading, such work being always performed, when required, at some distance from the farm. There are likewise a few other offices occasionally needed in homesteads, not found in this; but the system of husbandry and general economy in Aberdeenshire may account for the circumstance of no other apartments being indispensably required than those that have already been described.

Roadways.—There is a roadway twenty feet in width between the poultry-house and the cows' byre, which extends to the stack-yard, and another road of similar width on the west side of the steading, also leading to the stack-yard. These, as well as the roadway between the stables and the dwelling house, are formed with broken stones in the usual manner. It may be proper to mention that the latter appears much narrower in the plan than it actually is, in order to suit the size of this Magazine, the distance of the front range of offices from the

kitchen X and dairy Y being forty-two feet instead of twenty-two, as indicated by the ground-plan. The other roadways leading to the several apartments are of different widths, according to situation, that in front of the north range being nine feet wide. These latter roads are causwayed, *i. e.*, paved with round stones of a medium size, somewhat larger than those employed in paving the floors of the stables and cow-houses. Roadways of this kind are very durable, easily kept clean, and seldom need any repairs.

Water.—The buildings are all abundantly supplied with water brought in lead-pipes from a spring in one of the adjoining fields. The stables, it has been already remarked, are well provided in this way; and there is a water-trough formed of wood in the shed F for the use of the young stock occupying that division of the steading. Two other water-troughs, formed of the same material, are placed contiguous to the byre C for the use of the cows, and in all the troughs a constant supply of fresh water is maintained.

Drainage.—The propriety of thoroughly draining the site of the steading has not been overlooked; indeed this was deemed an indispensable preliminary operation. There are properly constructed under-ground drains through all the buildings, for carrying off the natural moisture of the ground, and which effectually prevent any dampness in the floors arising from under wetness. Thorough drainage, as well as the means of providing at all times an adequate supply of good water, are most essential requisites in the arrangement of every farm-steading, though both, especially the former, are often sadly neglected.

Dwelling-House, &c.—Having now described the different offices in detail, it will be necessary to advert very briefly to the farmer's dwelling-house, a ground-plan of which is given in the Plate. It was, however, built several years prior to the erection of the existing set of farm offices, and consists of two stories with garrets. In front are two good parlours W W, each sixteen feet in length by twenty-three feet in length, with a lobby and stairs between them, and a drawing-room and bed-rooms over head. The kitchen X is twenty-four feet in length and sixteen feet in width, and the dairy Y, forming the opposite wing, is of similar dimensions. The floors of both are neatly flagged. The house contains all the other apartments and conveniences usually found in the dwellings of Scottish farmers, but which it will not be necessary to particularize in the place. On the ground floor are the ale-cellar (*f*), milk-cellar (*g*), and cheese-store (*h*), besides the small apartments (*i i*) for storing butter and other miscellaneous articles. The front faces

the garden, but the back windows command a view of the steading.

Contiguous to the dwelling-house is an apartment Z which is employed in the double capacity of a wash-house and a boiling-house, boiled food being prepared in it for the horses occasionally during the winter; there are two doors, one opening to the garden and the other leading to the offices. Fronting the dwelling-house is a very neat and tastefully-kept garden, chiefly for raising fruit and vegetables; but the culture of flowers is not forgotten.

Expenses.—I shall now conclude this somewhat lengthened description of the farm-buildings at Wester Fintray by a brief statement of the expense incurred in erecting them. The whole of the steading was erected at the joint expense of the proprietor (the Earl of Fife) and of the tenant—the latter, however, having to defray only the cost of carrying the materials, digging and clearing out foundations, &c., while the former paid for the remainder of the work. The tenant's share of the expense, including the cost of cutting and forming the water-course to and from the thrashing-machine, levelling the surface of the stack-yard, &c., amounted to £362. The tenant has further to keep the several offices in repair till the expiration of his lease; but the duty of doing so will not involve much expenditure, owing to the substantial nature of the materials and workmanship. The landlord's proportion of the expense amounted to nearly £1,600, thus making the whole cost about £1,962 for erecting the farm offices alone, the dwelling-house having been built several years previously. This is unquestionably a very considerable sum; but the expense would now have been much greater, and it will, I think, be admitted that the buildings which I have attempted to describe in the preceding pages are of a very superior and substantial order, possessing every convenience essentially requisite in a steading for such a farm, and the particular system of husbandry pursued; and though true economy ought never to be neglected in any department of agriculture, especially in one so costly as the erection of farm-buildings, yet I am decidedly of opinion that mere economy of construction ought to be regarded as a secondary consideration compared with the proper accommodation of the live stock, and such a disposition and arrangement of the several offices as will be most conducive to the preservation of the health of the animals. It is certainly a most mistaken economy to erect inadequate ill-ventilated houses for the accommodation of horses and cattle, in which they can neither thrive for the advantage of the farmer, nor live comfortably for themselves.

December, 1845.

A SIMPLE METHOD FOR DETERMINING THE FREE AND COMBINED AMMONIA AND WATER IN GUANO AND OTHER MANURES.

The want of a simple, accurate, and at the same time expeditious method for determining the amount of ammonia in guano has, I think, been felt by most chemists who have been engaged in the analysis of that manure for commercial purposes, where time necessarily becomes a matter of importance; and as the following method, which I have introduced into the laboratory of Dr. G. Wilson, Edinburgh, where several analyses of guano are daily in progress under my direction, seems to me to possess these advantages, I beg leave to place it before the notice of chemists who

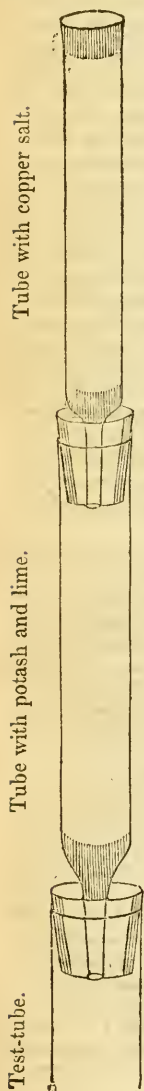
may be similarly circumstanced. The quantity of free ammonia in the guano is first determined, along with that of the water, by the following process:—A common test-tube (about 5 inches long and $\frac{1}{2}$ wide), is taken, and in it a determinate quantity of the guano under examination is placed; from 25 to 50 grs. will be found most convenient. To the test-tube is then joined, by means of a cork, a tube of the same diameter, but only about 4 inches long, having one of its ends contracted and drawn out, so as to pass through the cork, and leave a small communicating aperture for the escape of gas from the test-tube. A few fragments of asbestos are then placed in the contracted end of the tube, to prevent the aperture being choked up during the progress; and the tube is then filled with fragments of caustic potash, either alone or mixed with fragments of lime, which I prefer. To the top of this tube is then joined another tube of precisely similar construction, but being only about 3 inches long, and which, the asbestos being placed as before, is filled with coarsely-pounded sulphate, nitrate, or chloride of copper, previously well dried. A few fragments of asbestos are now placed on the top of each of these tubes, so as to prevent any of their contents from falling out. The tubes are then weighed separately. The three tubes are then connected; and the test-tube which contains the guano is placed in a water-bath until all moisture has been expelled. The tubes are now disconnected, and again weighed, when the quantity of ammonia contained in the guano in a free state is directly determined by the increase of weight

which it is found that the tube containing the copper salt has suffered, whilst the quantity of water is shown by the increase of weight in the tube containing the potash and lime. The quantity of combined ammonia has now to be ascertained, which is done by adding to the guano contained in the test-tube about an equal bulk of caustic lime in fine powder, and mixing well by agitation; then connecting the apparatus as before, and exposing the test-tube to a low red heat, all the ammonia is expelled and combines with the copper salt contained in the upper tube, and, as before, it is determined by direct weighing. It is very easy to judge when all the ammonia is expelled and when the operation should be concluded, as the ammonia, in combining with the copper salt, gives it, as it proceeds up the tube, a magnificent blue colour, which, when it does not extend any higher up the tube, indicates the conclusion of the operation. In the case of any other manure, where the ammonia has to be found, the operation is precisely similar to the example of guano which I have here taken. I have no doubt that, with some modifications, the condensation of ammonia by a salt of copper would be found of use in organic analysis for the determination of the nitrogen; and in one or two cases where I have tried it, the results closely approximated to those obtained by calculated.—D. Forbes, Esq., in the *Chemical Gazette*.

PLANTATIONS IN THE NORTH.

We alluded lately to the profitable nature of plantations in the Highlands, and our views have since been confirmed from various quarters. One gentleman, who has had the benefit of forty years' observation, writes as follows:—

“There is no doubt that there are many bare hills and sandy soils that by judicious planting could be made as valuable as arable land. A few years since, some acres of planted timber were sold on the Belladrum property at above £100 per acre. On the same estate in 1839, forty-two acres sold for £50 per acre, though there were only about 200 trees per acre left on the land, the former cutting being supposed to be of equal value. I have known properties in the north on which the forester doubled the amount received by the factor for land, and this, be it recollected, from ground which sixty years ago was not worth a shilling per acre. Any extent of surface may be enclosed and planted, for about 20s. per acre, with Scotch fir and larch; and if properly managed, the plantation, in forty years, will be equal to £20 per acre, and the same sum



every succeeding twenty years, if the planting is well attended to. Some forests might be made to yield even double the sum. It is a well known fact that there are plantations which yield £3 per acre, and will continue to do so as long as their owners choose, without trouble or expense."

With respect to the cost here stated, we consulted another party versant in woodcraft, and he confirms the remark of our correspondent. "The expense of enclosing," he says, "is much lessened as the extent of ground is enlarged. One square acre, for example, enclosed separately, will cost at least £5; whereas, a hundred acres, taken in at once, will not cost more than nine or ten shillings an acre. In this manner, when a considerable extent of ground is put under wood, the entire cost of planting and enclosing fir and larch will not be more than 18s. per acre. In districts where birch or hazel is plentiful, a wattled fence could be made for 2½d. per yard, and it is more effectual for keeping out game and sheep than a feal-dyke."

In some exposed localities by the sea-coast, plantations have been often tried without effect. Notwithstanding the repeated failures on similar situations, we understand Macleod of Macleod has been planting largely with complete success. The sea breeze generally cuts off vegetation on a level with the outer fence or dyke; but if the latter is made to slope at the top, the wind is thrown up, and though the first row may suffer, the second attains a greater height; and so on through the successive rows, each rising above the other as sheltered and removed from the cutting breeze. On conversing lately with Mr. Smith, the intelligent partner of the firm of Lawson and Smith, nurserymen here, we were assured that on the most exposed coasts this plan will be found to answer, and we hope our Caithness friends will make the experiment. First, construct a good dyke, sloping at the top, and then plant thick behind it! On the estate of Lochiel wire fences have been carried to the highest hills, to secure the young plantations; and, we believe, there are no finer specimens of wire fences in the north—strong with cast-iron uprights—than may be seen on Lochiel's estate. On other properties in the west—at Invergarry, Glenquoich, Lord Abinger's and Mr. Walker's—planting is also going forward. At Ardintoul, Applecross, Dundonald, and Gairloch, the same may be said; and in our more immediate neighbourhood there is scarcely an estate where planting is not in progress. In the famous forest of Rothiemurchus we observed lately that a good deal of larch and hard-wood has been put down. No Scots fir was ever planted there, as new seedlings rise from the old plantations so celebrated in former days. In the comparatively secluded district of Strathconnon about 400 acres are in course of plantation. We shall not attempt to enumerate all the places around Inverness or in Ross-shire, where similar improvements are going on; but, extensive as these are, there is still room for further increase, and the subject is one of national importance.—Inverness Courier.

DISEASES IN CATTLE.

TO THE EDITOR.

SIR—Having read several letters on the fatal diseases in cattle, in *Farmers' Journal*, *Bell's Messenger*, *Essex Herald*, &c., &c., from Dr. Armstrong, of Moat, Mr. Sutton, of Sawtry, Mr. Waters, of Putney, and from several others, I find they all differ in opinion as to the nature and cause of the disease, and the appearances after death. I find Mr. Waters states he has taken many *post mortem* examinations of cattle that have died from the disease, and he found the left lobe of the lungs hepatized, and of enormous size and weight. In one case, 1843, he says he found the left lobe weighed 78lbs., and had the appearance of round-jointed brick work, and not tainted by unpleasant smell as in acute cases of inflamed lungs; for in that case they would be as described by Dr. Armstrong, congested and gorged with venous black blood, gangrene, and mortification, with a horrid stench. He considers the epidemics of 1840 and 1841 were produced from atmospherical influence, and close and badly-ventilated cow-sheds, &c.; and that the present and fatal diseases are from hereditary predisposing causes; and no doubt many cattle that survived the shock of epidemics in 1840 and 1841 had a slight attack of inflammation, of an insidious form, on the lung, which has been succeeded by the escape of serous effusion into their cellular tissue and chest. From the debility consequent on the epidemic, which has been making a secret progress, and in some instances many months, even years, it has been thus progressing in size and weight, unnoticed by the owner; but it would have been recognised by a practical veterinary surgeon. But when this disease arrives at a certain crisis, the milky secretions are suspended (consequently no supply of milk), the cow leaves off chewing the cud, wastes in flesh, and dies from suffocation, sometimes in a short time. Now, to prove the disease hereditary, Mr. W. states he has examined many fetuses, dropped before the regular time of parturition, and which of course never drew breath; also many calves from 3 to 12 months old, and he found their lungs slightly diseased and hepatized, which no doubt were transmitted from the mother in embryo; for during gestation the fetus is nourished by the blood from the fetal artery of the mother, and if that be impure, it is unfit for the nourishment of, and communicates disease to, the fetus.

I beg to say I have read Mr. Waters's remarks with care and much interest, and I consider he has minutely described the cause of this most alarming disease, and has pointed out the stepping-stone for its removal, which is a great object to be obtained in putting a stop to one of the greatest calamities to the owners of stock, and is of the highest importance to breeders that can be suggested or offered. I therefore think, from the pains he has taken in searching out the causes and pointing out the remedy, he is deserving of the thanks and support of the public.

Being myself a practical man among stock for many years, I have, by examination, in many cases found symptoms exactly corresponding with those of Mr. W., and I am strongly of opinion, unless more caution is used in breeding and rearing calves for the dairy, we shall be a long time before the diseases become extinct. I therefore recommend persons who wean calves to select sound ones, the progeny of perfectly sound parents; if with coughs, &c., they should not be weaned for becoming mothers, for if unsound when first dropped, it is impossible they can ever become sound mothers, but may live and bear young, although diseased on the lungs. I am satisfied if the above method be adopted with care, it will sooner work a cure than any other, and the public will have good reason to appreciate the merits of Mr. Waters.

I am, &c.,

G. W.

THE EARL OF STAIR'S PRIZES FOR TURNIP CROPS, 1845.

We have much pleasure in announcing the result of the competition for the very handsome prizes offered by Lord Stair to his tenants to encourage the growing of turnips, and the proper cleaning, manuring, and general management of green crops.

The judges this year were, Mr. Alexander M'Clean, Auchneel; Mr. Cochrane, Craigcaffie; and Mr. M'Credie, Drummuckloch; and after several hard days' work in the inspection, from the points of Corswall and Kirkmaiden to near the Burgh-head, they awarded the prizes as follows:—
Prize of £20, for the best twenty acres of turnips; to Mr. John M'Bryde, Balker.

Prize of £15, for the best fifteen acres; no competition.

Prize of £10, for the best ten acres; to Mr. Donnan, High Ersick.

Three prizes of £5, for the best five acres of turnips; Mr. Fraser, in Portyerrock; Messrs. Donnan and M'Millan, Mains of Whithorn; and Mr. Alexander M'Meikan, Boreland.

The intelligent judges state generally that the crops of turnips exhibited are not so heavy as they were in some former years, but that they observe turnips are grown much more extensively over the country than formerly, and are generally much better managed. Three of the prizes are gained upon the estates purchased by Lord Stair five years ago, near Whithorn, where few turnips used to be grown, and where a marked improvement in general management is observable.

The judges regretted to observe one or two very excellent crops of turnips considerably damaged by the rot—caused probably by the cold damp season; but this was not general among the crops examined. It appeared worst in heavy lands richly manured; and it is believed the only cure is to lift the sound ones, and put them into narrow pits, covered slightly with straw. This was done last year at Culhorn, with some turnips grown on moss, where the disease appeared very extensively; and those so put into the pits kept quite well, and were fresh and good far into the spring.

We cannot close this notice without acknowledging the debt of gratitude which this county owes to the noble Earl for the judgment and energy with which he has persevered in pressing upon his tenants in Wigtownshire the cultivation of the turnip crop, so suited for our soil, and, in fact, so essential a point of good husbandry, that no farm can be profitably cultivated, manured, and improved without it. When his Lordship first offered prizes

for turnips, five years ago, few were grown, and few particularly by the small farmers; but now it is a farm far behind indeed, where some breadth of turnips is not sown. The stimulant which Lord Stair's handsome prizes afforded, unquestionably greatly aided the advancing agricultural intelligence of the district; and we trust that, now that the farmers have touched the immediate profits, and have also seen the effects of a well-managed turnip crop on the subsequent pastures, it would take a very high prize indeed to induce them to give it up as a regular and important part of their rotation. The great profits from feeding, last season, and the melancholy failure of the potatoes this season, will also weigh with many to adopt a crop less exhausting in itself—better suited for cleaning the land—and which in its consumption gives the means of raising future crops. Tenants should ever remember, in spite of guano, bones, &c., the old adage, that "Muck is the mither o' the meal kist."—Wigtown Free Press.

TURNIPS *versus* HAY.

The following is part of a speech delivered by the Rev. Mr. Huxtable, at the late meeting of the Sturminster Agricultural Society:—

"I am more and more convinced, that of all mistakes that can be committed, that of growing hay is the greatest. Pasture land is let in this country of a poor kind; I am not speaking of watering meadows, or of those rich meadows watered by the Stour, and let at 2*l.* or 3*l.* per acre: but, speaking of the average of lands, I say that a greater robbery never was committed on a nation than that of keeping these lands in pasture. An acre will cut one and a-half tons of hay: now, what will three acres do? They will keep a cow summer and winter. I am prepared to say, that two and a-half acres keep a cow; but then the cows are kept in the straw-yard for three months, and to produce the food for them during this time, I allot the other half acre. Let it be broken up. First of all it is thoroughly drained, and then if you have Swedes, he must be a bungler who cannot grow twenty-five tons an acre; and what is the worth of Swedes an acre? Let that be reserved for the present, and be pleased now to allow me to suppose that they are worth 15*s.* a ton, exclusive of the dung. Now you have got 25 tons at 15*s.*; exclusive of this come the tops. If a cow

gets hold of the tops, the butter will taste; but the great quantity of phosphates they produce will render milk abundant. You have got, then, the first year, 25 tons of Swedes, the gross proceeds of which will be 18*l.*: I presume that you eat off this; and that you will have produced sufficient manure for that land. Then the next year you grow wheat; you will grow, at least, on that land nine sacks of wheat per acre; or you'll grow fifteen tons of green clover an acre, and in the next year nine quarters of oats. I pledge my word that you can grow these crops, because I have done it myself. Now, look at the nation's benefit from this: you have grown nine sacks of wheat an acre, twenty-five tons of Swedes, and nine quarters of oats. And now I ask you, what has the cow been doing? She has made 200*lbs.* of butter, and 212*lbs.* of cheese, and the nation can feed from the arable land 240 more mouths than the cow can feed. I say it will not do to depend upon protection, to keep foreign corn out. We ought to come before the country and say, 'We are doing all we can to feed you, but we cannot give you English corn at foreign prices, with English burthens.' But are we doing that? Do we come with clean hands to ask for protection? I think we have a claim to protection. I love farming, and think that apart from my sacred profession, which visits the sick, there is no occupation so useful as that of endeavouring to amend the habits of agriculture among us.

"Now, about poor lands. It is poor land that I love; I don't want your 50*s.* an acre land. I had some miserably poor land called Boys Knap, at Sutton; the value of it was merely nominal—1*s.* an acre; I've broken it up, and in this way:—Last July, some fifteen poor men from Shaftesbury came to me and begged for employment, so I told them to go and break up this land; they were to have 2*d.* a lug for digging it, but they could not dig it, so they were obliged to get their pickaxes and break it up. It was very hard ground, and excepting two or three thistles which got into the rabbits' dung, there was nothing to be seen. Now, here was a fair place to try whether I could make any thing grow. The principle I proceeded on was not guess work, but certainty. If you take Swedes and burn them, they will leave a certain quantity. The portion that is left is what we call earthy element; that which is burnt the air element. Now, chemistry says to us that if we will give to certain plants their earth element, and a certain portion of air element, then it matters not about the soil; I believe and know that to be true. I determined that I would grow twenty tons of Swedes an acre, and five tons of tops. If you burn twenty tons, the result would be 500*lbs.* of ashes. Now, these ashes consist of more than

one-half of potash, one-third of soda, one-eighth of phosphoric acid (what we get in bones), and the other one-eighth of sulphuric acid, with a little magnesia. I then got a lot of saw-dust, and put it under pigs, and decayed it with phosphoric acid; for I must tell you that when once saw-dust takes it into its head to decay, nothing on earth will stop it. Now, how was I to get more potash? I got wood ashes, and found that these wood ashes contained about 2*lbs.* of potash a bushel, and 2*lbs.* of soda. Next, I wanted to get the phosphates; those I got from 2000*lbs.* of Ichaboe guano. The next thing was, how was I to put in the manure? My theory was to make holes about two feet apart; but there was one serious objection which kept me awake all night—how was the manure to be applied without destroying the seed, for it is so powerful it will grow no weeds between. I got some good garden mould, in which I mixed the seed and manure. The crop began to grow, but the fly got very busy, and I was afraid that after all I was what they call 'diddled.' You know, white seed will germinate three or four days before Swedes; I got some white seed, and when the plant appeared the fly left my Swedes to go upon the white turnips, and I wished them good morning. Where the children neglected to drop the seeds upon the manure, the roots were not half as big as a marble. Then, about three weeks ago, we took up these turnips. We weighed 19 tons and three-quarters upon the lightest portions of the land, and upon the heaviest 23 tons and three-quarters. The aggregate average was 22 tons an acre, the value of which we will now discuss. What was the cost? 30 bushels of wood ashes, 15*s.*; 2 cwt. of guano, 17*s.*—32*s.* For manual labour, 19*s.* 6*d.* The rent I've placed at 5*s.* an acre, rates and tithes at 2*s.*—in all, in round numbers, 4*l.* Now let us see what the Swedes were worth. I find that 112*lbs.* of Swedes, will, upon the average, put on 2*lbs.* of live flesh. Then the value of that at 7*d.* a pound, dead weight, reckoning that the live weight is to dead weight as 4 to 3, brings my Swedes to 17*s.* 1*d.* a ton. Now, what's the value of the dung? I bring it to 4*s.* 1*d.*, which makes it equal to 21*s.* 2*d.* But I will take the popular value of 15*s.* a ton. Now, for £4 an acre I have a return of 300 per cent.; and if that is not a sufficient return I don't know what is. You see I want you to be enthusiastic. If you will only be as enthusiastic as I am, you may laugh at these free-traders. We agriculturists support 27 millions of people, and our produce amounts to the enormous sum of 540 millions sterling, whilst the exported manufactured goods amount, on the average of 6 years, to not quite 47 millions. Then I tell you, you must become enthusiastic."

THE POTATO FAILURE.

TO THE EDITOR.

SIR,—The failure of the potato crop this season is, in my opinion, owing to the cold and wet, and the defective drainage of the land, they being too shallow to absorb the immense quantity of wet of the present year; and as a proof of this, I have found that, wherever the potato was planted on dry land, and had the full benefit of the sun and air, it is free from the disease. And for further proof, on Nateby, Winmarley, and other mosses in Lancashire, the fields are not parted from each other by fences, but by ditches and water courses: the surface of the ground, by this means is dry, being from three to five feet above the cold water and clay; and here the potatoes are free from the disease, but not those grown on what is here called the under-ground, that is, where the moss has been cut away for turfas fuel, so that there are only about eighteen inches of the peat earth from the clay and water. I may here observe of the top and bottom of these mosses, before they are cultivated, and in their wild state, that the top surface for about two feet is of so bright a nature, that it is not fit for turf; and it is the same in the bottom of these mosses; and I have seen from four to seven feet of fine peat earth betwixt the light top and bottom, as above stated, and converted into turf for fuel, and sold in large quantities, and also made into draining covers; and the Duke of Hamilton as had, the last summer, made upon Nateby Moss 160,000 of those draining covers, for his estates in that neighbourhood, which will cover about twenty miles long of drains. The time of making them is April, May, and June; but before this is done, the moss is cultivated for corn, and potatoes and turnips, and answers well for that purpose, and when cut away, it is then called the underground; and some years ago it was supposed that it would be better land for produce, but which now proves otherwise. The mode of cultivating it is this: It is ploughed in March, April, or May, and sometimes as late as June, if the season is wet; is dried by the sun and wind; made into heaps and burnt; and then spread abroad, and the ground ploughed, and the corn sown. The following year the same thing is done, planted with potatoes or turnips, in ridges about thirty inches apart, and raised from ten to twelve inches high, and manured along with the burnt ashes. By this plan abundant crops are produced, and this year as much as 120 loads per acre. The load here so called is 240lbs. weight; this is not the

case in the under-grounds, but they are affected, notwithstanding that the ground was burnt, in the same way as the others. It is well known to the agriculturists of the mountainous districts, that the potatoes there grown on the sides of the dry hills above the sea are always the soundest, and best flavoured, and the most nutritious; and the turnip has also been found, of late years, to answer the same thing on high grounds. This is, no doubt, owing to their having the sun and the refreshing air, and being free from all obstructions from the trees, the same as those grown on the mosses; and again, those grown in confined gardens, under or near trees and hedges, have this year been destroyed by the disease, for want of free sun and air. It has been said by some writers, that the disease has been caused by frost; but I believe that not to be the cause, as the tops of the potatoes on the above named mosses were cut down by the frost in September last: now, these potatoes have been taken up, and prove free from the disease, and are an abundant crop, with the exception of those on the under grounds. It is, therefore, quite clear that drainage is the vital part, and of the most importance, both in agriculture and gardening; and as Mr. Parkes as well and truly observed, a great part of the draining which has been done will have to be done over again, owing to their having been done too shallow. I consider a drain thirty inches deep a mere nothing, compared to one forty-eight inches; and, where this is impracticable, Mr. Parkes has clearly pointed out a remedy by making apertures in the earth, varying from six to fifteen feet deep according to the strata; and they are made about six feet in diameter, and filled up with small stones: six of those have been found sufficient for sixty acres. This plan is also well calculated for lands reclaimed from the sea. The above are my views of the first and great cause of the failure.

The second cause is in pitting them, as in former years, before they were sufficiently dry, and which ought not to have been done till the mould which stuck to them was like dry dust; and where this was not the case, there has been a very great destruction in those pits, although, when put therein, they were free from disease; and it is to be regretted that the customary directions were not more attended to: if they had been, there would have been a great abundance saved in England. I am glad to observe in the Irish Farmers' Gazette of Dec. 6, page 519, that

great care has been taken, as pointed out by the commissioners, and it is thus stated in the above named page 519.

With thankfulness I can now confidently state, that I have not the slightest apprehension of want in Ireland; but on the contrary, by care and attention, there will be a superabundance, which will, the ensuing spring, bring a high price for exporta-

tion to those countries which have nearly lost all. These remarks and observations fully coincide with what is stated in page 503—5—6 and 553—4—5 of the "Farmers' Magazine" of December last; therefore, if you think these remarks worthy of recording in your magazine, they are at your service. I am, yours, &c., M. SAUL. Nateby Lodge, near Garstang, Dec. 13, 1845.

REPORT OF EXPERIMENTS WITH DIFFERENT MANURES ON HAY, POTATOES, CORN, AND TURNIPS, IN 1844; WITH OBSERVATIONS ON THEIR CONTINUED EFFECTS ON THE SUCCEEDING CROPS.

BY MR. JOHN WILSON, JUNIOR, EASTFIELD, PENICUIK, MID-LOTHIAN.

Hay.—The ground consisted of four acres, which were divided into sixteen portions of a rood each. Nine different manures were used, seven of which were applied at two different places, and the other two, for want of sufficient room in the field, were applied to only one portion each.

The field has a gentle declivity, with a southern exposure; the soil is what is termed a thin upland clay, resting on a clay subsoil, and was drained about four years ago at thirty feet apart; but, to render it thoroughly dry, it would require intermediate drains. To have the ground as nearly as possible of the same quality, the field was divided into oblong portions in the same direction, and of the same breadth as the distances between the drains, so that each portion had the benefit of one drain.

It may be proper to state that, although the ground is as nearly as possible of the same quality, and its previous management in regard to manuring and cropping the same, yet it will be observed, on perusing the following table, that the crop on the west side of the field was better than that on the east. The only reason I can adduce for this is, that, previous to the sowing of the grass-seeds, the east side was ploughed in February, and the west not until March, immediately before the seeds were sown; but, as this difference in the time of ploughing, and the results arising from it in the weight of the crop, took place exactly between the two sets of experiments, no error will be made from considering both portions of land of the same quality; and although the crop of one-half of the field was superior to the other, the substances employed acted nearly in an equal degree in each.

The substances employed in one set of experiments were—

- | | |
|--------------|---------------------------------|
| 1. Urine | 6. Nitrate and sulphate of soda |
| 2. Rag-Ley* | 7. Common salt |
| 3. Soot | 8. Guano |
| 4. Saltpetre | 9. Nitrate of soda. |
| 5. Nothing | |

In the other set they were—

- | | |
|---------------------|---------------------|
| 3. Soot | phate of soda |
| 4. Saltpetre | 7. Common salt |
| 5. Nothing | 8. Guano |
| 6. Nitrate and Sul- | 9. Nitrate of soda. |

With the exception of the urine and rag-ley, the substances were applied on the second of April. It had rained two hours before they were begun to be applied, and continued to rain sometime after they were put on, which immediately washed the substances into the roots of the plants, and in the short period of four days the effects of the nitrate of soda, soot, and guano, were quite discernible. The rag-ley and urine were not applied until the last week of April, when the ground was very dry and the weather rather cold. An inspection of the crop was taken at intervals during its progress, but it will be sufficient to state that No. 9 took the lead in point of strength and dark green colour. About the end of May it was very superior to any of the others, both clover and rye-grass being very luxuriant. Nos. 3, 4, 6, and 8, were much improved at that period, but not equal to No. 9. No. 7 was in no respect improved. No. 2 a little. No. 1 growing luxuriantly. Previous to this the whole field had a good appearance, and nothing could exceed the luxuriance of Nos. 1, 4, 3, 8, and 9; but the drought at this time was becoming very severe, and the wind being from the east, the field was much exposed to it. In the middle of June, the whole field was suffering severely from the continued drought, but No. 9 was still keeping the lead, and, with the exception of Nos. 2 and 7, the rest of the dressed portions had a good appearance.

The hay was cut on the 13th and 14th of July, and when win, each experiment was put into a rick in the field, where it stood until the 28th of August, when the whole was weighed at a public weighing-machine, and stacked.

* The water in which the rags are boiled at the paper-mills.

THE FOLLOWING TABLE SHEWS THE RESULTS:—

No.	Description of Manures.	Quantity per Acre.	Cost per Cwt.		Number of Imp. Stones of Hay.	Rate per Stone.	Value per Acre.		Value of Hay, after deducting cost of Application.	Gain per Acre.	Loss per Acre.
			s.	s.			£.	s.			
1.	Urine	galls. 1920	..	32	240	6	6 0	4 8	0 16	..	..
2.	Rag-ley	galls. 1920	..	7	160	6	4 0	3 13	0 1	..	..
3.	Soot	20 bolls.	..	20	216	6	5 8	4 8	0 16	..	..
4.	Saltpetre	1½ cwt.	24	36	240	6	6 0	4 4	0 12	..	..
5.	Nothing . . . .	..	..	..	144	6	3 12	..	..	..	..
6.	Nitrate and sulphate of soda	1	19 9	37	216	6	5 8	3 11	..	1	..
7.		2									
7.	Common salt	5	3	15	144	6	3 12	2 17	..	15	..
8.	African guano	4	10	40	228	6	5 14	3 14	0 2	..	..
9.	Nitrate of soda	2	19	38	268	6	6 14	4 16	1 4	..	..
3.	Soot	20 bolls.	..	20	184	6	4 12	3 12	1 4	..	..
4.	Saltpetre	1½ cwt.	24	36	192	6	4 16	3 0	0 12	..	..
5.	Nothing . . . .	..	..	..	96	6	2 8	..	..	..	..
6.	Nitrate and sulphate of soda	1	19 9	37	176	6	4 8	2 11	0 3	..	..
7.		2									
7.	Common salt	5	3	15	96	6	2 8	1 13	..	15	..
8.	African guano	4	10	40	176	6	4 8	2 8	..	..	..
9.	Nitrate of soda	2	19	38	208	6	5 4	3 6	0 18	..	..

THE FOLLOWING IS THE AVERAGE OF THE TWO EXPERIMENTS:—

1.	Urine	galls. 1920	..	32	240	6	6 0	4 8	0 16	..	..
2.	Rag-ley	galls. 1920	..	7	160	6	4 0	3 13	0 1	..	..
3.	Soot	20 bolls.	..	20	200	6	5 0	4 0	1 0	..	..
4.	Saltpetre	1½ cwt.	..	36	216	6	5 8	3 12	0 12	..	..
5.	Nothing . . . .	..	..	..	120	6	3 0	..	..	..	..
6.	Nitrate and sulphate of soda	3	..	37	196	6	4 18	3 1	0 1	..	..
7.		5									
7.	Common salt	5	..	15	120	6	3 0	2 5	..	15	..
8.	African guano	4	..	40	202	6	5 1	3 1	0 1	..	..
9.	Nitrate of soda	2	..	38	238	6	5 19	4 1	1 1	..	..

All the substances employed, with the exception of common salt, gave at least a small profit: but I am inclined to think, had the drought been less severe in May and June, that the increase over the undressed portions would have been much greater. I may state, in regard to common salt, that although it has failed this season, 1844, I had previously used it to great advantage. In 1843 it increased the hay crop nearly one-third; and I presume that it was owing to the dryness of this season that it had no beneficial effect on the first

crop, as the grasses appeared stunted in their growth after it was applied, from which they only partially recovered; but, as the second crop was evidently benefited by it, and as the expense of applying it is trifling compared to some of the other substances, I think, in inland districts, or where the ground is not exposed to the action of prevailing sea-winds, it may generally be used to advantage.

The rag-ley gave only a small increase; but I am led to infer, from the above result, and from the appearance of the second crop, that, in localities where

it can be obtained, it might be employed to advantage. In this experiment, the ground was exceedingly dry when it was put on, and did not get the advantage of a single shower till the crop was far advanced, which might prevent it from producing the effects it might otherwise have done; but when we bear in mind that a great quantity of it is daily running from the paper manufactories, without, as far as I know, being put to any useful purpose, I think it ought to be experimented upon, to see if it has any effect in promoting vegetation. I am not aware of the ingredients of which it is composed.

Being convinced of the great utility of applying urine as a top-dressing, I think it is always entitled to a place in experiments made for the purpose of testing different manures. In this experiment it was applied after the ground was very dry, yet it increased the crop ninety-six stones per acre, and the increase would probably have been much greater had there been more rain. Although the soot increased the crop nearly as much as any of the other manures, the hay was rather inferior in quality, as the clover did not succeed so well where it was applied.

Although the hay is all valued in the table at the same rate per stone, it may be proper to state that the quality of the hay was much improved on the portions dressed with nitrate of soda, guano, saltpetre, mixture of nitrate and sulphate of soda, and urine; which, of course, makes the gain from their

application considerably greater than what appears in the table.

The remainder of the hay crop on the farm was dressed with soot and urine, and the increase was much the same as in the above results.

The second crop was only allowed to grow about four weeks, until the cattle were put into the fields to pasture, so that the value of it could not be so accurately ascertained: but, with the exception of the portion to which the soot was applied, all the others were decidedly superior to the undressed portion.

Potatoes.—The quantity of land experimented upon amounted to three acres—nearly level, with a northern exposure: the soil is earthy loam, superincumbent on clay, partially drained with stones, but not thoroughly dry. In the autumn of 1842 the field was ploughed out of lea, and sown with oats in 1843, which was but a middling crop. After oats, it was ploughed deep in autumn, and cross ploughed and well cleaned in the spring of 1844. The drills were drawn thirty-four inches apart, and forty cubic yards of farm-yard dung were spread in the drills; the potatoes planted on the last day of April and first of May, and covered in with the double mould-board plough. The weather was very droughty at the time of planting, and the ground, of course, very dry; but the potatoes braided regularly; and the dressings were applied during May and June, and the crop lifted and weighed on the 8th, 9th, and 10th of October.

THE FOLLOWING TABLE SHEWS THE RESULTS:—

No.	Kinds of Manure and when applied.	Quantity per Acre.		Cost per Cwt.		Quantity in Tons, &c. per Acre.	Value per Acre.	Increase in Tons per Acre.	Value of Increase.
		Cwt.	s. d.	s. d.	tons.cwt.qr.					£. s. d.	tons.cwt.qr.	£. s. d.
1.	Guano applied on the 30th of April in the drill with the dung previous to planting the potatoes,	2	10 0	20 0	9 1 0	18 2 0	0 15 0	1 10 0	
2.	Rape-dust put in at the root of the stem about the middle of June,	5	6 3	31 3	10 1 1	20 2 6	1 15 1	3 10 6	
3.	Guano applied on the top of the drill on the 30th of May,	2	10 0	20 0	14 5 1	28 10 6	5 19 1	11 18 6	
4.	Nothing,	—	—	—	8 6 0	16 12 0	—	—	
5.	Guano put in at the root of the stem about the middle of June,	2	10 0	20 0	10 3 1	20 6 6	1 17 1	3 14 6	
6.	Urine applied between the drills, as collected during the months of May and June,	Gallons diluted. 1920	—	32 0	11 11 3	23 3 6	3 5 3	6 11 6	

It will be observed that, in No. 1, where the guano was applied in connexion with the dung, and in No. 5, where it was put on as a top-dressing *after* the plants had made their appearance, its effects were small in comparison to No. 3, where it was applied on the top of the drill *before* the plants came up. Before applying it in this manner, the drills were well harrowed down with the common drill-harrow, and the guano carefully sown on the top of the drill, and then covered up with the plough, and rolled.

From the effects produced, I am inclined to infer that this is the most judicious method of applying guano to the potato crop. Throughout the season, this portion far exceeded any of the others both in point of strength and colour.*

Oats.—The field has a gentle declivity with a northern exposure. The soil, a sandy earth upon subsoil of sandy clay. Not drained. The quantity of land experimented upon was five roods, and ploughed from clover lea in winter; sown on March 29th with Hopetoun oats, and the manures were applied the same day, and harrowed in with the seed. The ground was divided into oblong portions across the field of a rood each,† and these were the substances applied:—

- | | |
|-----------------|----------------------------------|
| 1. Guano. | 4. Nitrate and sulphate of soda. |
| 2. Common salt. | 5. Saltpetre. |
| 3. Nothing. | |

[The subjoined table shows the results.]

An inspection of the crop was taken at intervals throughout the season. On May 10th the portions to which the mixture of salt and saltpetre, and a little improved guano, were applied, was decidedly superior. On June 6th the guano portion was excellent, and the others still a shade better than the undressed portion. On July 1st the guano portion was again excellent, the salt giving no visible difference from the undressed portion, and both the mixture and saltpetre portions improving rapidly since the rains.

In these experiments the common salt and saltpetre failed to give an increase sufficient to defray the expense of application, and the mixture of nitrate and sulphate of soda gave but a small profit;

* An experiment was made with the ammoniacal liquor of the gas-works as a top dressing both on hay and potatoes, and its effects were such as to encourage another trial, as both the portions were considerably improved; but as I could not depend on the accuracy of the results, I have not given them a place in the tables.

† It will be observed that these experiments were made on only one portion of land each. The farm not being of large extent, and a considerable portion of the hay and turnips being experimented upon with different manures last season, a sufficient quantity of land, and in the same state, could not be obtained to make the experiments twofold.

No.	1	2	3	4	5
Kinds of Manure.	Guano	Salt	Nothing	Nitrate of soda	Sulph. of soda Saltpetre.
Quantity per Acre.	4	10	5	3	19
Cost per Cwt.	10	10	1	1	1
Cost per Acre.	40	100	5	19	19
Produce of Grain per Acre.	7 4 0	29 1 19	5 6 0	18 3 0	31 0 4
Produce of Straw per Acre.	29 3 0	3 0	1 0 4	3 0	4 4
Quantity of light Grain.	6	6	4	8	7
Weight of Grain per Bushel.	40	do.	do.	do.	do.
Rate per Quarter.	20 3	8	do.	do.	do.
Value per Quarter of light Grain.	7 17 10½	2 2 18	6 6 3	7 7 1	6 10 4½
Value of the Grain Crop.	10½	7	5½	6½	4½
Value of Straw per Cwt.	2	2	1	1	3
Value of the Straw Crop.	12 19 6	11 6 0	1 17 9½	2 1 0	5 0 2½
Excess of Produce in Grain.	8	8	14	6½	2½
Excess of Produce in Straw.	11 0 2	0 2 0	0 3 13	1 1 1	1 12 10½
Value of excess in Grain.	17	17	17	17	17
Value of excess in Straw.	2	2	1	1	2
Value of excess in Grain and Straw.	19	19	18	18	19
Gain from Application.	19 2	19 2	19 2	19 2	19 2
Loss from Application.	—	—	—	—	—

but I would partly attribute this to the land having been in good condition, as the crop on the undressed portion was good, and the oats on the dressed portions were all lodged before they came to maturity.

The nitrates generally add more to the bulk of the straw than to the weight of the grain per bushel; and in this case, though the grain was winnowed to the same weight as that from the undressed portion, the quantity of light grain was greater. There was very little difference in the appearance of the samples after being dressed for the market, except that from the portion dressed with salt had the best colour.

Turnips.—The turnips occupied 13½ acres; the ground was nearly level; bounded on the north by a plantation, the other sides being exposed. The soil was a light gravelly earth, resting upon a gravelly subsoil. The field was ploughed out of lea in the autumn of 1842, and a crop of oats taken in 1843, which was a poor one, being only twenty-two bushels per acre. After the oats, the land was deep ploughed in autumn, and well cleaned in spring, previous to sowing the turnips.

Ten acres were manured with twelve cubic yards of farm-yard dung, one cwt. of guano, and eight bushels of bones per acre; these were sown between the 31st of May and the 10th of June. The crop averaged twenty-five tons per acre.

In order to ascertain the comparative effects of a few special manures, a portion of land of equal quality was reserved, upon which the following experiments were made. The drills were drawn at twenty-eight inches apart, and, in connexion with twelve cubic yards per acre of farm-yard dung, which were spread in the drills, the following substances were applied:—1st, a mixture of bone-dust and guano; 2nd, guano; 3rd, bone-dust. The experiments were made two-fold, on half an acre each; and a portion was left between the two sets of experiments with nothing but the dung, to prove their comparative effects. Immediately adjoining these, two single portions were manured with saltpetre and gypsum, and the results of the whole are given in the following tables.

The turnips were the Gordon yellow variety, sown on the 6th of June, and the crop was weighed on the 31st of October.

No.	Kinds of Manure.	Quantity per Acre.		Cost per Cwt.	Cost per Acre.	Produce in Tons, &c., per Acre.	Value at 10s. per Ton.	Increase from Application.	Value of Increase.	Gain from specific Manure.	Loss from specific Manure.
		s. d.	s. d.								
1.	{ Guano and Bone-dust,	cwt. 1¼	12 6	28 6	25 10 0	12 15 0	8 16 0	4 8 0	2 19 6	0 0	0 0
		bush. 8	16 0								
2.	Guano, .	cwt. 2½	10 0	25 0	24 2 0	12 1 0	7 8 0	3 14 0	2 9 0	0 0	0 0
3.	Bone-dust,	cwt. 16	2 0	32 0	21 19 0	10 19 6	5 5 0	2 12 6	1 0 6	0 0	0 0
4.	Dung only,	cub. y. 12	0 0	0 0	16 14 0	8 7 0	0 0 0	0 0 0	0 0 0	0 0	0 0
1.	{ Guano and Bone-dust,	cwt. 1¼	12 6	28 6	26 13 0	13 6 6	9 19 0	4 19 6	3 11 0	0 0	0 0
		bush. 8	16 0								
2.	Guano, .	cwt. 2½	10 0	25 0	23 14 0	11 17 0	7 0 0	3 10 0	2 5 0	0 0	0 0
3.	Bone-dust,	cwt. 16	2 0	32 0	21 11 0	10 15 6	4 17 0	2 8 6	0 16 6	0 0	0 0
4.	Saltpetre, .	cwt. 1¼	24 0	30 0	17 10 0	8 15 0	0 8 0	0 4 0	0 0 0	1 6	
5.	Gypsum, .	cwt. 5	3 6	17 6	19 19 0	9 19 6	3 5 0	1 12 6	0 15 0	0 0	0 0

THE FOLLOWING IS THE AVERAGE OF THE TWO EXPERIMENTS:—

1.	Guano and Bone-dust, }	..	..	28 6	26 1 14	13 0 9	9 7 2	4 13 9	3 5 3	0 0
2.	Guano, . .	..	..	25 0	23 18 0	11 19 0	7 4 0	3 12 0	3 7 0	0 0
3.	Bone-dust, .	..	..	32 0	21 15 0	10 17 6	5 1 0	2 10 6	0 18 6	0 0
4.	Dung only, .	..	..	0 0	16 14 0	8 7 0	0 0 0	0 0 0	0 0 0	0 0
5.	Saltpetre, .	..	..	30 0	17 10 0	8 15 0	0 8 0	0 4 0	0 0 0	1 6
6.	Gypsum, . .	..	..	17 6	19 19 0	9 19 6	3 5 0	1 12 6	0 15 0	0 0

A few experiments were made on another part of the same field; and, although the portions of land were small, amounting to only one twentieth of an acre each, yet the results are not uninteresting.

The substances were applied in connexion with twelve cubic yards per acre of farm-yard dung, the turnips sown on the 28th of June, and the crop weighed on the 31st of October.

No.	Description of Manure.	Quantity per Acre	Cost per Cwt.	Cost per Acre.	Weight per Acre.	Value per Acre at 10s. per Ton.
			s. d.	£. s. d.	tons. cwt. qrs.	£. s. d.
1.	Bone-dust,	bush. 12	2 0	1 4 0	14 0 3	7 0 4½
2.	Guano,	cwt. 2	10 0	2 0 0	14 6 1	7 3 1½
3.	Sulphate of soda,	3	9 0	1 7 0	11 17 2	5 18 9
4.	Dung only, . . . . .	..	..	....	8 2 0	4 1 0
5.	Rape-dust,	5	6 3	1 11 3	12 19 1	6 9 7½
6.	Sulphate of ammonia,	lbs. 100	0 4	1 13 4	8 2 0	4 1 0
7.	Saltpetre,	cwt. 125	24 0	1 6 9¼	9 19 3	4 19 10½

In these last experiments the land is nearly of the same quality with the portions upon which the other experiments were made, but the crop was much inferior throughout, which may partly be ascribed to the farm-yard dung being inferior and partly to the season having been too far advanced when the turnips were sown, all the late sown turnips in this district being deficient this season (1844).

From these results, and the experience of former years, I am led to conclude that, when guano and bone-dust can be obtained at a moderate price, they may, in all cases, be applied with the farm-yard dung to turnips with advantage. In these experiments the crop was greater when these two substances were applied together than when applied separately; and, when we consider the nature of bone-dust and guano, it is evident that a mixture of the two will always have a good effect; for where guano is applied alone, it causes a rapid growth, and the turnips have a tendency to ripen prematurely; while, on the other hand, the bone-dust causes them to come away slowly, but continues to grow

them till the season is far advanced. Now, when both are conjoined, the guano secures a regular braird, while the bones keep the turnips in a growing state during autumn. In the above experiments the turnips with guano kept the lead till about the middle of September, when they began to fade a little in the tops; and where the mixture was applied they continued so luxuriantly for a month afterwards, but, when weighed, were beginning to fade, while the bones kept them still green and improving daily. Seeing this to be the result when applied in connexion with farm-yard dung, the inducement to apply them conjointly is considerably greater when no farm-yard dung is allowed. I have not unfrequently seen turnips with bones comparatively useless from being tardy in brairding, and I have likewise seen them with guano very deficient on account of ripening prematurely, but I have always found them excellent when these two substances were applied together.

The turnips on the gypsum portion brairded rather irregularly, but improved much during Sep-

tember and October. Those on the saltpetre portion likewise braided rather irregularly, and failed to increase the crop so much as to defray the expense of the application. The sulphate of soda, though not equal to bone-dust and guano, appeared throughout the season to have a considerable effect. The rape-dust portion had always a healthy appearance. The sulphate of ammonia seemed to have very little effect.

Having been in the habit, for a number of years, of making experiments with different manures, I have not been inattentive to the effects which they produce on the succeeding crops of the rotation.

In applying bone-dust to turnips, I have frequently found that, at the rate of from twenty-five to thirty bushels per acre, the crop was as good as when thirty cubic yards of farm-yard dung were applied; but the succeeding crops in the rotation, particularly the hay, were generally deficient; but, by consuming the half of the turnips on the ground by sheep, the crops throughout the rotation were as good, and often superior to those manured with farm-yard dung.

Nitrate and sulphate of soda have an excellent effect when applied as a top-dressing to the potato crop; but I never could discern any difference on the succeeding crops. Soot, when used as a top-dressing on hay, seems to exert the most of its influence on the crop to which it is applied. Guano appears to benefit every kind of crop without exception, and although it is of an active nature, and brings the crops early to maturity, its effects are not confined to the first year. Last year, 1843, I used it to a considerable extent as a manure to the

hay, turnips, and potatoes. Where it was applied to the hay there was no remarkable difference in the oats of this season; but its effects in the second year could not be expected to be great, as it was used only at the rate of one and a-half and two cwt. per acre: but where it was used in the drill at four cwt. per acre for potatoes, the oats were superior this season to those manured with farm-yard dung at the rate of thirty cubic yards per acre.

A field, which is rather steep, and to which it is difficult to apply farm-yard dung, was manured with bone-dust in 1839 for turnips, the whole of which were carted off the field, and only a small allowance of lime compost applied the following spring. The crops were good throughout the rotation, and it was again manured for turnips in 1843 with guano at four cwt. per acre, which raised a good crop, the half of which was consumed on the ground by sheep. The oats which followed were excellent, and the seedling grasses on the field at present are beautiful; thus shewing that the land may be kept in a high state of fertility without the use of farm-yard dung. But I would consider it the most judicious practice to apply either guano or bone-dust as an auxiliary to farm-yard dung rather than as a substitute.

In situations where the dung made on the farm is all the putrescent manure that can be obtained, it is, no doubt, a great advantage to the cultivator to obtain these fertilizing ingredients at a moderate cost, as, by applying the dung made on the farm in connexion with these substances, to the whole turnips and potatoes, almost any farm may be brought into a high state of fertility.—Journal of Agriculture.

REPORT OF THE FRAMLINGHAM FARMERS' CLUB,

PRESENTED AT THE GENERAL MEETING, 18TH NOVEMBER, 1845.

Upon the sixth anniversary of the Framlingham Farmers' Club, we beg to present the following report of the discussions at the monthly meetings of the past year, trusting it will be found to comprehend some useful matter, worthy the attention of the practical farmer.

31st December, 1844.—“On the utility of Farmers' Clubs for the discussion of agricultural subjects.”

The member who introduced this subject, took a cursory view of the various modes of obtaining information, *viz.*: reading, hearing lectures, observation, and conversationally debating any given subject:—and having held that the latter

mode was useful on all general questions, urged that it was peculiarly so in questions relating to the theory and practice of agriculture: that the ideas entertained and the systems pursued by different farmers are so various, that farmers' clubs are the best possible test to which these diversities of opinion and practice can be brought: that so, if beneficial, the knowledge and practice of their neighbours, may be improved; and, if otherwise, errors of practice may be corrected, and those of opinion dissipated. After stating the most popular objections to farmers' clubs, and showing that they had no rational foundation, he proceeded to mention their many advantages, and concluded by pro-

posing the following resolutions, which, after separate, animated, and interesting, discussions, were unanimously adopted, *viz.* :

“That this mode is applicable to agricultural questions.”

“That the alleged objections to farmers' clubs are groundless.”

“That farmers' clubs are useful institutions; beneficial to those who attend, and consequently to the neighbourhood in which they are held.”

28th January, 1845.—“On the several kinds, and cultivation of spring corn.”

In introducing this subject, the gentleman confined his observations to the previous preparation of the land for barley, beans, peas, and oats to the time of sowing; and the best kinds for this neighbourhood. As it would be impossible in a summary of this kind, to enter into the many observations made, and arguments used, in such a wide field of discussion, we must content ourselves by giving the resolutions agreed to.—First with respect to barley—

“That the long fallows should be finished ploughing in October or November.”

“That beet and turnip land generally required ploughing only once; but for sheep folded turnips, twice or thrice was necessary.”

“That drilling was the best manner of putting in barley.”

The club was nearly divided in opinion with respect to the time of sowing:—some thinking the first of March quite early enough, whilst others thought that any time after the first of February, when the land would work well, the sooner, the better.—The club was also equally divided in opinion as to which should have the preference Chevalier, or Nottingham barley.

For beans it was decided:—

“That it would be better, if possible, to muck and plough before Christmas.” “To drill them in the month of February.”

Several members were in favour of dibbling.—It was determined by the members present, to make a thorough trial as to the merits of rolling when about three inches high, to make them blossom from the lower part of the stem. One member who had tried this plan, spoke greatly in favor of it; and the Norfolk prize essay speaking so decidedly in favor of it, renders it very desirable to be tried. In general it is right to begin harvesting beans early—as soon as they begin to turn in colour. French tick white eyes were considered the best.

For peas, it was thought better not to manure previously, but to plough early, in October or November.—To drill the first week in February, and that the dirty white were the best. Many members were in favour of maple peas. It was deci-

ded, “that it was not generally desirable to mix peas and beans.” Some members mixed tares and beans, but to this many objections were raised.

Oats.—The club came to a resolution, “that it may sometimes be desirable to grow a crop of oats instead of barley.” The club was equally divided in opinion, as to whether the drill or dibble was best; but determined, “that the sooner they were put in after Christmas, the better.” The common white oat was considered the best; but the winter oat, which should be planted soon after harvest, or at Michaelmas, was highly recommended, as it may be twice fed off, and then stand for a crop.

The foregoing opinions were recorded without any reference being made to the former opinions of the club, as it was thought desirable to obtain the present feelings of the members upon these matters. Several extracts were read during the evening from the Norfolk prize essay, on these points, that the members might compare their own practice, with the systems pursued in that county.

February, 25th.—“Is the principle of thin sowing applicable to this district; and on the merits of horse-hoeing our corn crops.”

The member who introduced this subject, commenced by reading extracts from a pamphlet, by Mr. H. Davis, who strongly advocated the use of a much smaller quantity of seed, than is the general practice, *viz.*, three pecks of wheat, and six pecks of barley per acre; alleging that independently of the saving in seed, the crop will be much more productive.

It was acknowledged by the members that after so favourable an account had been given of the success which had attended Mr. Davis in his practice, that it was a subject deserving their most serious consideration; but it appeared to them that the nature of the soil, and the time of sowing (more particularly of wheat), should be duly considered.

Several questions naturally arose for discussion, before attempting to deliver an opinion upon this subject; *viz.*, Whether the nature of the soil should be the guide to the farmer in forming his opinion of the quantity of seed to be used? Whether or not, “thin sowing” be more applicable to light, and thick sowing to heavy soil? Whether less seed is required when put in early, and a greater quantity later in the season? Whether by much thinner sowing, there is as great a security from danger by wire-worm, effects of weather, and vermin?

One member, an advocate of thin sowing, stated that five pecks of wheat, and seven or eight pecks of barley per acre, would be sufficient seed, and more productive than eight pecks and twelve pecks respectively.

Another member said, that he always endeavoured to obtain a full plant of wheat, as a thin plant was more subject to mildew.

Another said, that in a field of wheat his drillman made a mistake on the first part of the field, and put in little more than half of the seed intended, the remainder was put in at his usual rate, and on the first part he had much the better crop.

A member said, that five pecks of tick beans was a good seed, and that from this quantity he had been very successful.

On the other side, another member stated, that he thought four bushels was not too much, and instanced his cottage allotters who always put their beans in much thicker than he did, with decided success.

Another said, that he now used more beans for seed than formerly, and was satisfied that he had a larger produce from doing so.

With regard to soils, one member said, the better the land the less seed was required, for it would tiller out and soon fill itself up well; and that more seed was required on light poor soils, for the stem would be single.

Another member immediately gave his opinion, that the better the land, the more seed was proper, for in really good land, there was strength to bring a greater number of plants to perfection.

Many spoke supporting either side of the question. With such conflicting opinions it was impossible to arrive at any definite result: and many members promised to test a thinner seed than they had been used to, and report the result.

The discussion of the question was concluded by the club agreeing to the following resolution, *viz.* :—

“That the principle of thin sowing as recommended by Mr. Davis is well worthy of attention, and in support of it, it is right to state that much less seed is used in this neighbourhood than formerly; the reduction in some instances nearly approaching to the diminished quantity used by that gentleman: that due regard should be paid to the quality and condition of the land, and to the time of seeding: that no stated quantity can with safety be relied on as suitable to all circumstances: and that it is thought right to mention the quantity of seed most generally used in this district, *viz.* :—

Wheat,	6 pecks per acre.
Barley,	10 ”
Peas,	12 ”
Beans,	10 ”
Oats,	12 ”
Tares,	10 ”

With the understanding that when put in early a less, and when late, a larger quantity is used.”

On horse-hoeing corn crops, it was resolved, —

“That if confined to the pea and bean crops, it is deserving great attention, particularly as a preparation for the wheat crop which follows. The system has been extensively used in this county for more than half a century, but has been partially discontinued on account of a superabundant supply of labour, and it ought never to entirely supersede hand-hoeing and weeding.”

March, 25th.—“On the injury produced by heavy fences, and hedge-row trees to arable land.”

The importance of this subject was manifested by the interest which the members of the club took in the discussion. The questions which came under review in connection with this subject, are as follows, with the resolutions attached.

1. “The object of fences.”

“To prevent cattle trespassing from one field to another—being the cheapest boundary—they supply bushes for making faggots for cattle-yards—firing for farm house and labourers—assist in draining, and add to the beauty of the country.”

2. The advantages of hedge-row trees.”

“To supply the materials for repairs—the pollards supply some wood for occupiers—the timber adds yearly to the value of the estate to the owner.”

3. The injury occasioned by fences, hedge-row timber, and pollards.”

“The corn growing near is not so good—does not ripen at the same time, and therefore injures the sample—a nursery for weeds—a shelter for birds, who often strip nearly the crop from the headlands adjoining—the roots of the timbers and pollards spreading so far under the surface, renders the land less productive of corn.”

4. “The amount of loss occasioned by excess of heavy fences, and hedge-row trees.”

“The waste of land by hedges and ditches in the Framlingham district, is 6 per cent.—additional injury done by heavy fences, hedge-row timber, and pollards, between 3 and 4 per cent. in the produce; besides the annual expenditure to the occupier in scouring out the ditches, repairing drains, choked by roots growing into them, &c.”

5. “The best mode of lessening this damage.”

“By throwing down every unnecessary fence, where a good inclosed main drain will answer the purpose of taking off the water—by straightening and renewing irregular fences—by cutting down close every eight or ten years (or perhaps six) young fences, buckheading alternately—by trimming up fences, both in width and height, when on the south side of a field—by keeping the ditches and backs of banks well plashed, and so free from brambles or rubbish of any kind. And

on the part of the proprietor, not to let any except oak timber, or oak pollards remain between arable fields: and if thought desirable, not alone for the beauty of our country, but for the maintenance of its power, to plant, say one acre in every hundred, with proper timber; as by this means, the landlord would be at the expense of rearing that for which he alone receives the benefit, and not as we fear is too often the case, at the expense of the crop of the occupier. We think by following this plan, a saving to this district might be effected of $1\frac{1}{2}$ per cent.

April, 22nd.—“On the management of heavy land, and the advantages of having field work in a forward condition.”

After considerable discussion, the following general principle was unanimously voted:

“The good management of heavy land requires it to be well drained, kept clean, and in a fine tilth for depositing the seed. As these cannot be accomplished in our district but in dry weather, never stir horse, man, woman, or child upon the land, if possible to be prevented, except when it is dry. The great advantage of having all field work in a forward condition is, that it prevents the necessity of working the land in a wet state, and enables the farmer to take all advantages of suitable weather.”

One of the chief points of discussion during the evening, arose on the question, “how can we proceed upon this opinion in carting our turnips off for cattle during the winter?” To this question, two answers were given, and on the merits of which the members present were equally divided. One party contended that all our turnips should be carted off our heavy land by the latter part of November (before frost if possible), and carefully stored. The others recommended about two thirds only by that time, and to leave the remainder standing in the field till February, taking the advantage and chance of frosty weather to get them off.

A considerable difference of opinion existed, as to whether it was better to cut the leaves off in the field, and plough them in; or storing the turnips in very small clamps, earthed up; or carting them off with their tops on, and placing them together in a wheat stubble, or stack-yard, leaving the tops and leaves as their protection, or at most, adding a slight covering of straw. The majority were decidedly in favour of the latter mode, for the following reasons; that there was *less danger* of heating and decaying, and a far better chance of preserving the quality of the turnip; and this would more than compensate for the advantage to the land from ploughing in the tops. Another mode was also advocated, *viz.*, carting off the tops and small turnips to the pastures, for sheep and lean stock;

and laying the turnips in heaps, covering them with straw only.

May 27th.—“The kind of education best suited for young farmers.”

This evening's subject was introduced by W. Edwards, Esq., reading a very interesting and valuable paper to the club, upon the importance of a general and more comprehensive system of education for young farmers, showing its practicability, and pointing out its many and great advantages; which gave the greatest satisfaction to the members.

After an interesting discussion, the following resolutions were unanimously agreed to:—

That the best thanks of the club be given to Mr. Edwards, for his very valuable address on the kind of education best suited for young farmers.

That Mr. Edwards, having, at the particular desire of the club, placed the MS. of his address at their disposal, the president be requested to forward it to Mr. Shaw,* offering it to him for publication.”

“That the club highly approving of Mr. Edwards' suggestions, and in accordance with them, is of opinion that it is most desirable that young farmers should have the means of better education placed within their reach.”

“That having recognized the necessity of better education for young farmers, the club most respectfully calls the attention of the public generally, and of landowners in particular, to the propriety of establishing in this county, an institution similar to the Royal Agricultural College at Cirencester.”

June 24th.—“The points possessed by domesticated animals most desirable for the farmer to cultivate.”

In defining the points most desirable in domesticated animals, we must look to the respective purposes for which they are designed, and seek for those points in each particular species which most fits the animal for the performance of the object to be obtained.

We require of the different portions of the brute creation different excellencies, and even in the same species different powers. Some horses are bred for strength, others for speed. Some cattle for their profit to the dairy farmer, others for the grazier. The object for which the animal is intended must therefore be given, before a useful exposition of its necessary points can be attempted.

In the *saddle horse*, we should look that he be

* The offer was accepted by Mr. Shaw, who published the address in the *Farmer's Magazine*, and subsequently sent seventy copies for the members of the society.

well up in the fore-hand, with the shoulders standing backward, and well tapered off; a good bosom and girth, with good loins and round hind quarters, with plenty of length from the hip to the haunch and stifle; the tail high seated. We should look particularly to his fore-legs; that they were clean and fine, with a long good arm and flat below; the pasterns not too long, but plenty of room for action; not too high in his trot, and that he had a preparatory action of dropping his heel in placing his foot upon the ground; that his legs were not too long, as he would not in that case stand his work so well upon the road. That his feet were sound and hardy, and had not been contracted by narrow shoeing. That his eye be brilliant and prominent, with a full round socket for the eyeball; and that the expression of the eye be mild and intelligent. That the ears be wide apart, rather than narrow; that his muzzle be fine, and his nostril full; and that in his action he be perfectly free and easy throughout his entire figure.

In the *plough horse*, we require that he be what is called *well coupled*, with roundness and thickness in every part of the frame; with short legs, and great substance of both bone and muscle; great depth in girth and backward rib; and short in the flank in its adjunction to the thigh. We do not think it a fault if he be a little longer in the barrel, than the strict line of beauty will allow, provided he has a good back and loin, and is well ribbed up, with plenty of depth in the carcass; an inch or two in length adds greatly to the weight of the horse. He should be fine in the coat and skin, he cools better after a day's work; and it is a sign of greater purity of stock. Some will tell you, that a small horse, well made, is as good as a large one; but we must have plenty of weight for our heavy land district.

Of *grazing beasts*, beginning with a kind, of which a great many are now brought to this neighbourhood, *viz.*, half-bred Irish and shorthorn; it is desirable that an animal of this description exhibits as little of the dam, and as much of the sire as possible; that his head be fine and long, and if his coat be hairy, that it be soft and silky; that his horn be as near like the true shorthorn as can be selected. In colour, if not quite white, as much like the best shorthorn colours as possible; blood-red and white, rather than the pale yellow, red, and white; or with black mixed in; if mottled, that the colours be mingled like the shorthorn roans, and not in the wiry streaks of the Irish. In the touch, we should be particular that his skin is loose upon his sides, it being of more importance than the touch upon the rump's end. An Irish beast may touch pretty well there, and be confined and hard upon his ribs; such will never be thick of meat.

The forehead and brow should be mild and smooth in aspect; the eye gentle and intelligent. There is a hard-favoured, sour, crusty, frosty look in low bred Irish beasts which should be avoided; this is not peculiar to Irish beasts, for we see occasionally a face of the same kind, with small sleepy eyes, in low-bred Scots, such are equally objectionable.

As the points to be looked for will be better described in the true *short horns*, we proceed at once to that breed. In colour, the white, the roan, and the blood-red and white, are the favorites; the coat in preference, thick and furry, soft and silky. The head should be long; the horn, neck, and bone fine; the back straight and broad to the neck; hips wide, and loin well spread out to the hip; deep in the flank, and under the arm well rounded to the fore leg. With this shape, the longer the barrel, the greater the weight; but extra length is objectionable, if you take with it a loose loin, small girth, fleet carcass, and long legs. The bosom should be broad and full, the buttocks and thighs broad and roomy, the skin fine; the touch, soft, yielding, and pleasant to the hand; if too loose, the beast may not be so hardy. The best possible touch will not compensate for want of constitution.

The best bred *runts* are doubtless better than Galloways, but the Scotch keep them at home, now that they also graze for the London market. The head, frame, and family character of the runts and shorthorns are very similar.

The *Galloways* are thicker and squarer in the head, and have a fulness about the chaps and lips. They are thicker and deeper in the thigh, than the runt and shorthorn.

There are *cross bred scots*, nearly Galloways, but larger and finer bred. If we can select such, thick and deep in the frame, we may consider them the best description of Scotch beasts.

The *Highland Scot* should be thick, broad, and deep in the frame: have a thick, fine, long, furry coat; be fine in the horn, with an appearance of growth in it at any age; not looking sear and sapless; and he should be much stronger in the hocks in proportion to his frame than any other breed.

The *milch cow* should be fine in the head and neck, deep in the fore quarter, straight on the back; wide spread hips; bag large, thin, and soft; with the teats well formed and well placed.

As "sheep and swine" are to be discussed at a future meeting, the consideration of them was altogether postponed.

July, 22nd.—"Wheat, its kinds, and management."

A very pleasing discussion on this important subject occupied the evening. It was gratifying to find that lengthened experience only tended to con-

firm the opinions recorded at former meetings of the club, when this subject was discussed in detail; see report, 2nd July, 1841, "on hoeing or weeding, and harvesting;" also 17th January, 1843, "on the best method of filling up a deficient plant of wheat;" and 5th December, 1843, "on the circumstances which ought to guide the farmer in his selection of the different varieties of wheat for seed."

Of the kinds of wheat at this time used, Tunstall (white), and Spalding's (red) were generally advocated. But little progress has been made in regard to mowing of wheat, and the general feeling seemed to be that it was better adapted to the light soils with their short straw, than to our longer straw in this heavy land district.

A strong opinion was given that many persons did not take sufficient care of preserving and spending the colder, &c., arising from threshing and dressing their wheat.

September, 16th.—"On the care and management of agricultural implements."

In commencing the discussion of this interesting and important subject, it was agreed by the meeting, that it would be useful at some future time to consider the respective merits of the various implements recently introduced to facilitate the operations of agriculture; it being highly desirable that each farmer (at least in the beginning of business) should select such implements as are best adapted for the work intended. Having selected them, the farmer should next see that he has plenty of shed room for storing them when not in use; such sheds are best open only on one side, as a thorough draft carries in the snow and rain in winter, and dries them in summer. Low sheds, covered with haulm, are sufficient for the smaller articles, such as rolls, harrows, ploughs, &c.

All farming implements should be kept in thorough repair—painted from time to time; and the carriages frequently greased to prevent friction, and unnecessary labour to the horses. Harness, not in use, should at all times be kept in a place perfectly free from damp; much attention is required to keep it in good working order, and it ought at regular intervals to be washed, oiled, and thoroughly repaired, for in nothing is the old adage more true, than this, "a stitch in time saves nine." How often implements should be painted, and the kind of paint best adapted for the purpose, gave rise to some discussion. The anti-corrosive paint was spoken well of, as being durable, perfectly waterproof, and easy of application; and as being used under the sanction of Government in the Ordnance department.

There being no diversity of opinion to call for a

division, the meeting closed the subject by the following resolutions:—

"That great care is required in the selection and preservation of agricultural implements; that to effect the latter, they should always be secured from weather, when not in use; they should, independently of incidental repairs, be periodically washed, painted, and mended, and the carriages greased. Harness also at regular intervals, should be taken to pieces, washed, oiled, and thoroughly repaired."

"The anti-corrosive paint is also recommended to the attention of the farmer."

October, 21st.—"Sheep and swine."

Both of these are worthy every attention of the farmer, being profitable kinds of stock; directly, in the repayment of money; and, indirectly, in improving the productive state of the farm. The hogs more particularly by their manure, and the sheep by their teathe, and by their clearing the land of weeds, which no other stock will consume.

As our district is too heavy for a breeding flock, it is recommended to buy lambs as young and early as possible; they come in at a reasonable price; and upon the better land than they have been accustomed to, thrive rapidly and are in good condition and strong, when wet and wintry weather arrives.

As southdowns are not so universal in this neighbourhood, the half-bred Leicesters are to be preferred, being more ready sale.

As the shape of domesticated animals was so lately discussed, and as so many points are common to all well-shaped animals, it will suffice to say, that lambs should be broad in the shoulder, neck, and head; they should carry their heads well up, and be lively and strong; be good in the loin, the eyes full and mild; the fleece of good quality down the flanks and thighs; the wool continued to the shanks, and on to the edge of the face. Great care is required to prevent injury from the fly.

It was resolved:—

"That half-bred down and Leicester are the preferable kind."

"That sheep should be kept as much as possible on the arable lands, by a succession of rye, tares, clover, stubbles, and turnips."

"That one to three acres be considered a good proportion for a heavy land district."

"That they increase the fertility of the soil, and are generally more remunerative than neat stock."

"That it is desirable to increase the number of sheep upon our farms; to effect which, the land must be thoroughly drained."

The discussion on swine was postponed.

The prizes for the sweepstakes were adjudged as follows:—

Long red beet, yellow globe ditto, Swedes turnips, and common ditto, to J. Pierson, Esq., of Framlingham.

Long yellow beet, pudding turnips, and white wheat, to Mr. James Read, of Laxfield.

Red wheat, and barley, to Mr. Alfred Borrett, of Framlingham.

AGRICULTURE OF SOUTH AUSTRALIA.

The state of cultivation may be inferred from the following transcript of official and duly-accredited statements:—

In 1840 the number of acres cultivated was 2,403; in 1844 the number in cultivation was 26,918. The following estimates in reference to wheat cultivation have been made by one of the leading corn-factors, whose correctness may be vouched for:—

The quantity of land producing wheat crops during the last three years appears from the Government returns to have been—

	Acres.		Bushels.
1842	14,000	} Producing, at 15 bushels to the acre,	210,000
1843	23,000		345,000
1844	18,980		284,700

Total	839,700
The quantity required for home consumption in the three years of 1843, 1844, and 1845, would be	420,000
For seed during the same period.....	60,000

	480,000
Total.....	359,700
The quantity exported up to the end of June, 1845	203,342

Leaving a gross available overplus of bushels..... 156,357

The estimate of the produce is low, and allows for every kind of waste, crops cut green, fires, and other casualties; and the quantity stated as surplus will, it is believed, be fully borne out.

The cultivation of wheat has rather fallen off, in consequence of the low price obtained. The highest prices for wheat during the last two years have been from 2s. 9d. to 3s. per bushel, though the quality is such as to have produced for it the highest prices in Mark Lane, and in the neighbouring Colonies. A considerable increase has, however, taken place in the cultivation of barley and oats, the former being extensively used in brewing.

The flour mills and manufactories are annually increasing in number, and enlarging their operations. In 1844, such establishments counted 56 in all, which comprise 21 flour-mills, of which eight are driven by steam.

The increase of stock has been such that the following authorised data for 1844 have been considered by all well-informed persons much below the real aggregates, namely:—

Sheep	450,000
Cattle	30,000
Horses	2,000
Goats and pigs.....	12,000

HIGHLAND AGRICULTURAL SOCIETY.

BEST MODE OF REARING POTATO SEED.

Mr. Stephens here obtained leave from the noble chairman to read a communication from Mr. Alex. Tod, market gardener, Easter Road, near Edinburgh, on a successful mode which he had practised for several years past of raising potatoes for seed, and which Mr. Tod considered might also be practised by farmers who wished to raise good seed potatoes. After referring to the observation he had frequently made of potatoes which had grown deep in the soil being mealy and fit for the table, while those which were formed near the surface of the ground were waxy, and consequently unfit for the table, yet made good seed—he alluded to the conviction which this circumstance brought to his mind of the propriety of always raising potatoes for seed and those for food in different ways; and he was the more anxious to treat the potato differently for these different purposes, that he had suffered largely by failures in his early potatoes. His suggestions for raising seed potatoes are therefore derived from his own experience, and we believe they will be best understood in his own words. “The remedy I venture to suggest,” says Mr. Tod, “is simple and practical, and within the reach of almost every farmer, and of a character that it may be easily tried to a greater or less extent, according to circumstances. I propose that a portion of land most suitable for the raising of seed potatoes should be selected, and if it require manure, let it be applied and ploughed in during the autumn or winter months. In the spring, let the ground be wrought into a fine friable state, and plant the seed to the depth of two inches, and no more. During the summer, let the ground be kept loose and free of weeds, but do not earth up the plants. In autumn, lift the crop as soon as the stems begin to lose their greenness. By this method the crop will be as large as by the ordinary way; but what is of more importance, the germinating powers of the potato will be found greatly improved and invigorated; for the greater number of the tubers having grown above ground, will have the advantage of the light and air to form and strengthen in the buds or eyes, and therefore will be much hardier and not so easily injured by rain or frost as those grown in the ordinary way.” In conclusion, Mr. Tod says—“Before I adopted the above method, I had for several years failures in my crops of early potatoes, more especially in the ash leaf kidney, and the Adelphi early, but observing that such tubers as were accidentally growing above ground, exposed to light and air, had well formed, strong and vigorous eyes or buds, I resolved to adopt the said method of growing my seed, and have done so for the last four years; and the result is, that my crops are considerably larger than they were, and have no blanks.” To a question put from the chair, Mr. Tod replied, that he had cut his seed into sets when the potatoes were large, but planted the small potatoes whole. He considered it, however, of the greatest importance to manure the soil in autumn or winter.

THE CULTIVATION OF ROOT CROPS ON HEAVY LAND.

We are now to inquire into the best mode of cultivating our strong and tenacious soils for the growth of root crops, and likewise to what extent the cultivation of them can be carried with profit on such soils. I believe it will be readily conceded that roots can be produced on heavy soils, and large crops of them too, by good tillage and careful cultivation; but then comes the grand and puzzling question, "Can we consume the crop when we have brought it to maturity, without positive loss to our pockets, and ultimate injury to the land?" Some time ago I certainly should not have attempted to answer the question, or if I had replied to it at all, it would have been by declaring my conviction of the uselessness and folly of the attempt; but now the case is far different. We have discovered a mode of taking up and stacking away the roots when arrived at their full growth, with ease, and certainty of their preservation till a late period in the spring; and we have also, by the result of experiments carefully tested and duly registered, found out that sheep as well as other stock, when housed and kept warm and dry, will thrive faster and with less food than when folded in the usual way in the open field. I must remark likewise that the drainage of moist clay soils (which formerly were, from being saturated with surface-water, difficult to cultivate) is now well understood, without which drainage the necessary operations of husbandry cannot be carried on to good purpose, and without which the cultivation of roots should not be attempted; for if attempted, it will not be successful. I am sorry that I am not enabled to state, as the result of my own experience, facts on which you might safely proceed, but that I shall be compelled instead to resort rather to hints and suggestions for your adoption or rejection. These I leave to your better judgment, and to the test of future experiment and experience.

I will commence then by telling you what I did for upwards of thirty years since, when I began to attempt to be a farmer and a grower of root crops, and you may take me for an example to avoid: shun my errors. Well then, being aware of the great advantage of a plentiful supply of roots as food for my stock during the winter months, whereby to save my hay-ricks and increase my heap of dung, I divided my arable land into eight parts, taking as a rotation of cropping—turnips, barley, clover, wheat; cabbages and beet, oats, beans, or vetches; and lastly, wheat. Thus, a fourth of my arable land was annually producing a root crop.

This went on for a bit. I grew roots, good ones, and plenty of them; but how were they to be got off the land, at that time not thoroughly drained? I will tell you how it was. Got off they must be; for it was out of the question to think of feeding them off where they were growing; so I pulled them and fetched them away in carts as I wanted them, let the weather be as it might, wet or dry. You will say I got into the mire: I did so most certainly, but this was not all, for as the season advanced, and when the spring crops of oats and barley were to be planted, the land could not be worked properly, notwithstanding much labour and pains were bestowed upon it. The lent grain was, consequently, oftentimes a failure, or at best an indifferent crop, and so the scheme was, after a time, given up. Mine was an experiment farm rather than an example, at least one to be followed. I did not, however, like to allow myself to be dead beaten; and finding the great advantage of having a few roots in winter for my stock, I changed my course of cropping, and managed the eight pieces of arable land I at that time farmed as follows, viz.:—A rotation of six years. First, fallow or vetches manured, wheat, clover, wheat, beans, the land previously manured, and lastly, oats, to be succeeded again by winter vetches. On this rotation I have no cause to complain of my crops, which have been to the full as good as those of my neighbours.

The two remaining pieces, situated near the homestead, and also being tolerably sound land, they having been pretty effectually drained, I reserved for roots alternately with white straw or corn crops. The roots I have always carted off at my convenience, choosing as dry a time as I could, and have stowed them away with various success as to their keeping sound. This plan I have now pursued for several years, and have found the roots so grown to be of considerable advantage to my winter stock of cattle. The quantity of land being small (not exceeding seven or eight acres in a season), I have been enabled to go on without difficulty. These two pieces I consider the most profitable of my whole farm, having always grown me excellent crops of roots and corn alternately, having never lain idle, or having required a naked fallow, for upwards of thirty years. I have always kept them clean at a small expense, by forking out the little couch the land produced, at a cost not exceeding in any one year two shillings per acre. The ground is never ploughed more than once in preparation for the root crop; and in alternate years the

succeeding corn crops are usually put in, the ground being worked with the scuffler without ploughing. The only difficulty I had to contend with was to get the land into fine tillage for the root crop by once ploughing. This I effected after the following manner:—As soon as my winter vetches were in and my wheat-sowing finished (which I always drilled on a stale furrow, and in many instances after the scuffler, without ploughing at all), I looked over the field intended for a root crop very carefully, forking out with a three-grained fork every blade of couch that was visible. This, after the land had been once got into condition, was by no means either a troublesome or expensive job; never exceeding, as I before observed, 2s. per acre. The ground being thus prepared, at my earliest convenience; and having previously well opened out the old furrows in dry weather, I carted out on the land the usual dose of dung: and spreading the manure by carefully shaking out every lump, so as equally to cover the ground with it, I proceeded immediately to plough it into ridges of six feet in width, taking a deep furrow of at least seven inches. The land thus ploughed remained to receive the benefit of the winter frost, to mellow and sweeten till the spring, at which time, when thoroughly dried, I passed, if found needful, a heavy roller lengthways and across the ridges; and then put the scuffler to work lengthways with the broad shares, cutting the whole surface about two inches in depth, and thereby destroying a multitude of annual weeds which had sprung up since the land was ploughed. The dung ploughed in before winter remained undisturbed and well covered. Nothing now remained to be done till the time arrived for planting the cabbages and the beet root, or for drilling the Swedes, at which time the scuffler was again put through the ground nearly to the full depth of the furrow, now pretty well mellowed, mixing the manure, and further pulverizing the soil. By these means I have rarely failed to produce the requisite fine tilth, and have never been compelled to sow the Swedes twice. For should I apprehend danger of losing the plant from an attack of the fly, I have, while the dew was on the young turnip, dusted them with fresh-slaked lime: this I have always found a complete safeguard. The roots have been carted off the land and stacked away, and the land immediately prepared and drilled with wheat, generally with the scuffler alone, or it has got one furrow for some white straw crop, to be planted in the spring.

I have now told you all I know and have practised in the growth of root crops on my land, as grounded on my own actual experience, and shall now have to launch out into the region of fancy and untried experiment. No doubt you will say,

Why not let well alone; for if you do not, you will again, in all probability, stick in the mire? Perhaps I may; I cannot, however, burn my fingers in this matter, and have sanguine hopes of better success than attended me when I commenced farming many years since. Circumstances are now in my favour, which were then against me. I imagine that I possess more knowledge and experience; the drainage of the heavy clays is now well understood: a greatly improved method of storing the root crop is practised, which (since we can by no means reckon upon feeding off the turnips as they grow) is a necessary part of the business; and Mr. J. Morton, by means of accurate and well-tested experiments, has shown us that sheep can be fed, in littered yards and under shelter, well and quickly, with less food than they would have consumed in the exposed and open field-fold.

Now, gentlemen, matters standing thus, I confess that I am induced again to tempt my fate, and a second time to alter my course of cropping.

Arableland must, by management and by judicious husbandry, be rendered fit, not only to produce good corn, but also by the introduction of roots, where practicable, and by green crops, be made capable of carrying a large stock of cattle and sheep. I consider that system the best and most profitable where the land is made to produce alternately food for man and beasts; in other words, that two white straw crops should never be permitted to be planted in succession: this is the foundation and the groundwork of all good husbandry, and ought never to be departed from. It is the sole restraining covenant I would ever introduce into an agreement between landlord and tenant as to the cultivation of his arable land; for if this were strictly adhered to, the land and the landlord could never be materially injured by a tenant, and it might also be a means of removing a prejudice at this time prevailing in the minds of most of the landlords in the Vale of Gloucester, against converting worthless pasture into tillage land, which, if it were set about judiciously, would benefit the tenant, the landlord, and the country at large. I can show you two pieces of land which I myself broke up from pasture more than thirty years since, and which at that time produced me little or nothing, but which are now very valuable arable land; and as they have never been over driven, are at present more fitted for being returned to pasture, and are in better heart than when first ploughed up. But, gentlemen, you will say I have been running rather wide of the subject proposed; and I come back to tell you what I next propose doing, or endeavouring to do.

I must first observe that much of my land has been laid out in wide ridges of eight yards, ga-

thered twice from the flat, and drained where needful, with tiles and stones up every furrow. The remaining part of the farm is in lands of six feet or two yards wide, and has been drained many years since with shallow stone drains in a direction across the run of the furrows, at intervals of eight or nine yards, and with tile heads. This method of draining does not answer upon our close and adhesive clay soils, as it does not carry off the surface-water readily. It is my intention to set out these lands afresh, and to put them (as I have done the others) into ridges of eight yards in width, and to intersect the old drains, where necessary, by running others up the new furrows, at intervals of sixteen or thirty-two yards. By this means I hope to give the old drains a quicker vent, and to enable them to discharge the water more readily than they do at present. Other drains may at a future period be laid in those furrows which are at first missed, whenever it may appear necessary. We will now suppose the ground drained and rendered as sound and dry as such land can be made. We will also suppose the land to be in fair condition, and tolerably free from couch and root-weeds (for should the field have been run out, as we say, and full of couch, a naked fallow, on this kind of soil, must of course be resorted to). My mode of proceeding will be thus: I shall, in the first place, have the ground very carefully looked over, and with three-grained forks dig up every blade of couch and every dock that can be seen; having previously finished, as I said on a former occasion, sowing my winter vetches, and drilled my wheat. The land intended for a root-crop is then to be ploughed, in a direction diagonally to the run of the furrows, into single bouts of twenty-seven or twenty-eight inches, or into two-bout ridges where cabbages are intended to be grown. The appearance of the field will then be like garden ground laid up in trenches. I should plough as deep a furrow as practicable, exposing a large surface for the winter frosts to mellow and sweeten. After the land has become sufficiently pulverized, and the trenches are in a dry state, with a double mould-board plough I purpose thoroughly to open out and considerably deepen them, directly following with a stout plough, having the turn-furrow taken off, and with a strong team of horses harnessed at length, subsoil or stir the hitherto unmoved soil in the bottom of every furrow-trench, as deeply as may be practicable—six or eight inches at the least. This being not trampled on while in a moist and tender state, will lie light and hollow for the air and frost to sweeten and pulverize. Nothing will have to be done now to the land till the dry weather sets in in the early spring, be it in February or the beginning of March, at which time I intend to set the dung-

carts to work, and having spread the manure carefully in the bottom of the trenches, with a pair of horses, driven abreast, cover it up, by splitting or reversing the bout-ridges. These are again to remain untouched till well dried and pulverized, when an opportunity will be afforded of subsoiling or stirring the intervals. Thus, then, nearly the whole of the ground will have been loosened to the depth of twelve inches at the least, and a sufficient tilth gained; and that, too, at no very ruinous expense. I prefer to cultivate my turnips and other roots (such as cabbage and beet) on the ridge system, after the Scotch manner, because it will give me an opportunity of working the ground deeply and frequently during the growth of the crop, and because it will allow me, at the time of singling out the turnips, to draw the earth well away from the plants, whereby they appear to swell, and form better bulbs. I am now working a piece of seven acres in this way for roots, and shall be happy to show what I am about to any of the members who may feel disposed, or who may think it worth their while, to pay me a visit.

It is somewhat remarkable that in the autumn of last year I was suggesting the mode which I have now adopted of preparing my land for roots, by trenching and subsoiling, to one of our members, when he observed to me that he had met with the same idea, or something similar to it, in a Gloucester journal of November last. That member has sent me a copy of the paper, which I have now lying before me. I completely agree with the writer in principle, but not exactly in his practice. In the first place, I do not well understand how land can be ploughed into single-bout ridges with a wheel-plough; and I consider a swing-plough, with two horses abreast, far better calculated for the operation. I would likewise confine the trench-ploughing and subsoiling to the fields under preparation for the root crop, as I well know by practical experience that a surface which has been exposed to the action of the weather through the winter should by no means be ploughed down, but should alone be worked by the scuffler and harrows in putting in the lent grain. Strong heavy clays, such as I am farming, should be carefully and deeply ploughed before winter. This will enable the farmer (provided his land has been properly drained) to get through the necessary work in a way that would surprise any one who has never given the plan a trial. Our calcareous clays by exposure are rendered so friable that in spring they can be worked quite as readily as the lighter soils; but turn up the stiff and clung bottom after winter, and you will never recover that you have lost—namely, a fine workable surface; but, instead, you will be plagued with clods as hard as brick-

bats, which you may beat and hammer to all eternity without producing the desired effect, and that, too, at a vast expense. I am happy to find that some of my neighbours are at length beginning to open their eyes, and are following the lead I have given them.

Having thus stated to you, in the best manner I am able, my opinion of the practicability of raising root crops upon heavy soils, with profit and advantage to the grower, it only remains for me to declare to you to what extent I would propose their culture. I have now before me a paper, sent me by a friend out of the county of Nottingham, wherein Mr. Richard Parkinson, an eminent practical farmer of that county, has stated that, on a clay farm, he has for many years past pursued a course of cropping on a rotation of twelve or twice six years. I consider that his authority may be relied upon, and would follow in his track. I myself am holding twelve pieces of arable land, which I would crop nearly after Mr. Parkinson's manner:—

1. Cabbages, carrots, mangold wurzel, manured with dung.
2. Oats or wheat.
3. Seeds (white clover and ray-grass).
4. Ditto (red and ditto).
5. Wheat or oats.
6. Winter tares.
7. Swedes, manured with dung and bone-dust.
8. Wheat or barley.
9. Clover or cow-grass.*
10. Wheat.
11. Beans or peas, dunged.
12. Wheat.

Thus one-sixth part of the whole arable land would be under a root crop. I have little doubt of the practicability of this rotation, provided the land is furrow-drained as it ought to be, and the ground thoroughly cultivated, and subsoiled on the plan I have proposed. I will now leave the subject in your hands. The cultivation of root crops on such soils as those I am farming has been little practised and less understood, but is a matter well worthy your serious attention. I would by no means advise you to attempt it till such time as your land has been properly furrow-drained. And observe that your roots and turnips must be planted early, so that they be ripe and ready for stacking away before the bad or wet season sets in in the autumn; for you must not attempt to feed them off where they grow, or you will be, as I was some years

since, set fast in the mire, and from which I feel assured you will not get out without serious loss.—Mr. N., in the Fourth Report of the Gloucester Farmers' Club.

DARLINGTON FARMERS' CLUB.

DEC. 8.—*The Best and Cheapest Mode of Keeping Draught Horses during Winter.*—Mr. Walton, Vice-Chairman. Mr. Trotter said: I have paid some attention to the subject of keeping draught horses during winter for some years past, but for the last three years I have adopted quite a different mode to what I previously followed. My method formerly was to allow my draught horses each two bushels of oats per week, together with one bushel of beans and as much hay as they could eat, generally clover-hay; but for the last three winters I have fed them almost entirely on cut oat-sheaf, cut into half-inch chaff, which to me has been a very great saving. In an oat-crop of about forty stookes per acre, which might yield near sixty bushels, the feed of a draught horse averages two sheaves per day, or fourteen sheaves per week, which would be about a bushel and three pecks per week, if they had been thrashed out, which is a saving of a peck of oats per week each horse, from what I formerly gave them; besides, I save the bushel of bran per week, and the clover-hay, which was a very considerable item; for draught horses, you are aware, gentlemen, when they get three feeds of clean oats in a day, when at work, they will eat a great quantity of clover-hay besides. Now, when I first changed my mode of feeding from corn and hay to cut sheaf, the horses improved in condition wonderfully, thus showing that it suits them well. In very busy seasons, when they are very hard worked, I allow them half a peck of oats at dinner time besides the cut sheaf. Last winter I had only eighteen acres of oats; those kept twelve draught horses, besides four young horses occasionally. This quantity of oats would not have served me through the year, had I not pursued this system of feeding. The mode I have adopted of preparing the cut sheaf is this: I have my straw-cutter to work from the horse-wheel of my thrashing-machine, and I generally have as much cut in one day as will serve twelve draught horses for near a month. One man attends to and feeds the cutter with the oat-sheaves, whilst another man carries the cut sheaf into the granary ready for use, when it is taken to the stable in bags as required.

At the close of Mr. Trotter's remarks, a rather lengthy discussion ensued on the subject, but

* Dressed with lime previous to wheat, or a light dose of compost.

upon the whole it appeared that Mr. Trotter's mode was much the cheapest. The secretary also read an extract from the Highland and Agricultural Society's Transactions, by Mr. Carmichael, in which he says, in speaking of the draught horses of the clayey districts of Scotland, that—

“In the winter months each horse has a daily mess, or mash of boiled or stewed (not steamed) bean-chaff, mixed with light corn and small beans, separated by the winnowing-machine, or sieve, from the best grain, to which a few turnips and a portion of salt are added, with just enough of water to secure the boiler from injury, whilst the whole is being reduced to a pulpy state, and the pulp is then put into

one or more troughs, to remain till the evening, when the mash is divided among the horses at a temperature of about blood-heat, immediately on their return from the yoke. This, with bean straw, and the additional allowance of one feed of inferior oats and beans in the morning, and one at mid-day, when constantly employed, keep the horses in best possible condition.”

At the conclusion of the meeting it was resolved that from the statement of Mr. Trotter, it appears that his mode of feeding draught horses is much more economical than the methods usually practised, therefore it is desirable that it should be more generally adopted.

THE COMPARATIVE MERITS OF PLOUGHING AND FORKING.

(Prize Essay.)

BY EDWARD WORTLEY.

This essay was written in consequence of the following announcement in the advertisement of the eighteenth anniversary of MR. BAKER'S COTTERMORE PLOUGHING MEETING:—

“A premium of five sovereigns for the most approved statement on the comparative merits between ploughing and digging; experiments to extend over not less than four acres of land—viz, two acres to be dug, and two ploughed. Competitors will be expected to state full particulars as to their mode and cost of management throughout, together with the nature, quantity, and relative value of their crops, and the description of soil. Statements to be delivered to Mr. Baker, Cottermore, in November, 1845: the award will be declared at the annual meeting of the Rutland Agricultural Society.”

At the Rutland Agricultural Meeting, December 3rd, 1845, MR. BAKER stated that he had awarded the premium to the writer of the essay that had been delivered to him under the motto—

“Much food is in the tillage of the poor; but there is that is destroyed for want of judgment.”

The motto was acknowledged by Mr. Edward Wortley, of Ridlington, Rutland.

No sooner had I ascertained that a premium was offered for a statement of the comparative merits of ploughing, and of digging or forking, than I determined to undertake the experiment; and having just concluded the carting and weighing of the separate allotments, I feel great pleasure in thus

presenting the result to the public, hoping it may tend to establish correct principles, and emulate to advantageous practices in the husbandry of our country.

I shall endeavour in the following remarks to avoid entering at length into a theoretic essay, and confine myself as closely as possible to a practical statement.

Owing to the continued severity of the frost, the land was not broken up, either with the fork or the plough, until the month of March.

The experiment extended over four acres, which were cultivated in the following manner:—

One acre forked with the fork introduced into this neighbourhood by R. W. Baker, Esq., of Cottermore, and drilled with carrots.

One acre ploughed once, harrowed, and drilled with carrots.

One acre forked, and drilled with mangold wurzel; and one acre ploughed once, harrowed, and also drilled with mangold wurzel.

I should mention that the tines of the fork are fourteen inches long. It weighs eight pounds and a half.

The ploughing was done with a Ransome's N. L. Plough—depth five inches.

The previous crop—the fourth—was wheat; so that (this farm being cultivated on the five-field system) the experimental crops were last in the rotation, and the land itself by no means of first-rate quality; in fact, some few years ago it was a fox-cover.

The soil consists of a light red loam, mixed with red sandstone.

On the 12th of April the two acres of carrots were drilled with five pounds of seed to the acre, mixed previously with one cwt. urate, for the purpose of assisting in the more even distribution of the seed—one cwt. being too small a quantity to have much influence as a manure.

The two acres of mangold wurzel were drilled—the rows eighteen inches apart—on the second of May—the same quantity of seed as the carrots, and mixed, to facilitate the drilling, with the same quantity of urate.

No farm-yard manure whatever was applied to any of the crops. So that, however scanty the fare of food allowed, they were, nevertheless, all treated alike. The experiment was not for the purpose of testing *manures*, but *implements*.

Every one remembers how wet and unfavourable the weather was early in the spring. Cold and rain were the characteristics of the season; and the first appearance of the carrots was anything but promising.

The mangold wurzel—being sown later—came up more quickly and better. On the first appearance of the plants, there was not a discernible difference between those of the ploughed, or forked acres.

Every attention was paid to the hoeing; but in consequence of the slow-growing nature of the carrot, and the wild character of the land, it was rather an expensive process, but the cost not greater with one acre than another. They were all hoed by the day as the weather would allow; no exact account could, therefore, be readily kept of the cost; nor was it essential, because, being equal, it could not affect the comparative merits of the trial.

As the plants advanced in growth, the difference between the plough and the fork became very apparent, and was greatly in favour of the fork. Each acre was stumped out separately; but the greater luxuriance of the crops from the forking was so remarkable, that the stumps were rendered quite unnecessary for reference.

We began to dig the carrots up the first week in November. I superintended the gathering of all the roots myself, and can vouch for the correctness of the following statement.

MANGOLD WURZEL:—	T. C. Q.
Produce from one acre forked	13 2 2
Ditto from one acre ploughed	8 5 0

Difference *per acre* in favour of forking . . 4 17 2

Thus we see that we have an average gain of very nearly four tons of roots per acre by using the fork instead of the plough; and the only drawback is, the difference in the expense between ploughing and forking.

The forking cost twenty-six shillings per acre—the soil being stony, and never having been moved so deeply before; nearly two cart-loads of soft red stone were brought up in forking the two acres, which the plough of course had never touched.

Allowing ten shillings per acre for ploughing, it leaves sixteen shillings per acre only in favour of the plough, to stand against upwards of three tons of carrots on one acre, and nearly five tons of mangold wurzel on the other.

I scarcely know how to place a money value upon the roots, as we are not in the habit of selling any but to a farmer, who produces and consumes them on his own farm: I do know they are invaluable, both for food and manure.

But taking the market value of carrots at fifty shillings per ton, and reckoning the increase from forking of 3 tons 0 cwt. 3 qrs. per acre of carrots at fifty shillings	£7 11 10½
and deduct, for greater expense of cultivation	0 16 0

it clearly leaves us a balance per acre, of £6 15 10½ in favour of the fork.

Still more remarkable is its advantage in the cultivation of the mangold wurzel. Without deciding upon the price per ton of this root, even if its value should be less than that of carrots, this circumstance is more than counterbalanced by the relative produce being much greater.

Having now stated all the facts which bear upon this experiment, it will not, perhaps, be deemed irrelevant to the object of this paper to allude briefly to the reasons which may be advanced in favour of the introduction of the fork into our system of husbandry.

But first I would express a hope that it should not be imagined for a moment that the result of this experiment, convincing as it is, has led the writer of these remarks to wish for, or desire the extirpation of the *plough*—the ancient implement which he loves and venerates. Nor would he be thought so far to disregard the advancing improvements of the worthy agricultural mechanics of the present day, as to suppose that they cannot produce implements capable of closely imitating the

CARROTS:—	T. C. Q.
Produce from one acre forked	7 8 2
Ditto from one acre ploughed	4 7 3
Difference <i>per acre</i> in favour of forking . .	3 0 3

action of the fork; but, by whichever implement the operation be performed, let but the old, hardened bed of soil, which has not been, perhaps, for centuries disturbed—let this be broken up and rendered more permeable to atmospheric influence, and thus available for the extension and support of vegetation, and then—whether the implement be the spade or the scuffler, Mr. Baker's fork or Lord Ducie's drag—the principle is right, and the result sure to be good.

It is not contended, though, that forking is either necessary for, or would be alike advantageous to every crop: were this the case the supply of labourers would fall far short of the demand. Forking clover ley for wheat, for instance, on light land, would probably be injurious by rendering the soil too spongy and porous, when it is required to be solid and cohesive—capable of resisting frost, and preserving the young plant in the winter. Our object in forking is to secure a ready access of atmospheric changes into the soil—the very thing we seek to guard against, *during the winter season*, in the cultivation of wheat.

Then as we cannot fork for every crop, the question which next meets us is—When is the forking to be performed with the greatest advantage, and for what crops? I should say, without hesitation—in the autumn, for the fallow crop, and previously to manuring.

It is only of the benefit to a root crop that I can at present speak positively myself, but I think that benefit can scarcely fail to extend itself throughout the rotation. A little reflection will soon convince us of this.

The fork combines, in one simple operation, the perfect action of the common and subsoil ploughs. But, unlike the spade, and some subsoil ploughs also, it does not at once bring to the surface the substratum, which, if introduced too rapidly into the better soil, would doubtless prove prejudicial; nor does it confine itself to the same oft-frequented depth, below which, for years, the common plough has never ventured. When the fork has been thrust to its proper depth of fourteen inches, in wrenching it up, perhaps as much as the lower four inches will break into crumbs—if the expression may be permitted—and fall through the prongs of the fork; but nevertheless rendering the lower uncultivated soil more permeable to water and air, and the fibrous roots of plants, without bringing too large a quantity of it to the surface.

Rain and air exert a wondrous influence upon the fertility of soils, and that influence is much more readily exerted after the operation of the fork than the plough. This remark will be the more applicable if the farm-yard manure is spread upon the soil after the forking—the most prudent time

and method, in my opinion, of getting it upon the fallows, whether they be forked or ploughed. This is a point I am prepared to defend, but not here.

It has been said that an acre of wheat plants, after ordinary cultivation, will leave two tons of roots and fibres in the soil. If so, and I cannot contradict the statement, how much larger a quantity must be left after a root crop! a crop, too, with double the quantity of soil to grow in. This, which let us bear in mind is vegetable matter, is left to decompose in the fresh accession of soil, which thus becomes enriched and gradually amalgamated into one fertile body. The gentle commixture, from time to time, of portions of fresh soil with the old is a process in the highest degree beneficial for turnip cultivation, that root, it being well understood, flourishing nowhere so well as upon fresh soils. Then, when we come to our barley and other cereal crops, we shall again perceive the benefit of the previous forking. The advantage of a porous substratum, *and a deepened soil*, to afford an increase of food and space for the roots of growing plants, admits of no dispute. The bad effects of a low temperature caused by stagnant water in wet seasons are mitigated, because that soil which once was hard, and perhaps impervious, is now rendered capable of conveying away superfluous moisture from the roots, and preventing much injury to the crop. Of course I am not now supposing that forking is to supersede draining: on wet soils, if we wish to see them act well, they must act in conjunction.

We have a familiar instance of the injurious influence of stagnant water in observing its continued application to the pan of a water pot, instead of the surface of the soil in the pot. The water stagnating on a bed of soil too near the surface of our fields produces, doubtless, the same ill effect. It is indisputable that excess of moisture tends to the production of *cold* in the soil; but on the other hand, Mr. Parkes observes that “when a soil is naturally so porous, *or is brought into such condition by art*, that rain water can sink down into the earth, it becomes a carrier, an alert purveyor, instead of a robber of heat, and tends to raise permanently the temperature of the mass of useful soil, and this more particularly and beneficially during the vegetative season. Rain water at that time conveys downwards the more elevated superficial heat of the soil, and imparts it to the subsoil in its course to the drains; it leaves the soil in a fit state to receive fresh doses of rain, dew, and air, and in a better condition to absorb and retain heat, at the same time that *it promotes, in other ways, its fertility and productiveness.*”—*Journal R. A. S. v. 5, p. 124.*

Seeing, then, the importance of a proper supply of

water to the fertility of the soil, we must be at the same time convinced of the absolute necessity of facilitating, by *deep cultivation*, its access to the subsoil and furrow drains, because we then preserve it a moist, but prevent it from becoming a wet soil; we make an escape for the water, and insure an admission for the air.

Neither will the advantage of forking be lost in times of drought. The very action of the plough in turning the furrow tends somewhat to condense the soil, the particles of which are left in a much finer state of division by the fork. Well pulverized soils attract much more dew than those which are close and compact, because the radiation of heat is affected from many more points in highly comminuted, than plane surfaces. The greater the depth, and the finer the division of the soil, the longer will it be enabled (as numberless experiments have proved) to retain a sufficiency of moisture for the sustenance of the plant.

The improvement experienced in the root crops

will, chiefly from the same cause—the *introduction of fresh soil*—be found to exert an influence equally valuable upon the clover. So striking is the effect upon this crop, that Mr. Mitchell, of Wattlefield, finds, where the forking is properly done, that he can let his clover land remain down in seeds two years, where, before the introduction of fork husbandry, the same land would only maintain them for one year.

Besides, then, the first advantage which we gain in our turnips, or other roots, from forking, we shall evidently derive a further benefit in the subsequent crops, without the necessity of repeating the operation.

I shall only further add, in closing these remarks, that I intend both to continue and extend the use of the fork, because I believe it to be a most excellent and profitable tool—a useful and powerful auxiliary in the cultivation of the farm; for, of course, on large occupations it can only be used in conjunction with the plough.

A SKETCH OF GERMAN AND DUTCH HUSBANDRY.

Germany.—After leaving Belgium, and taking a hurried view of the magnificent scenery of the Rhine, I directed my steps to the north of Germany; and as most of the country I passed through was a mere barren sandy waste, possessing little attraction in its scenery to a tourist, and much less inviting in its agriculture to a farmer, I was not so particular in my inquiries as in Belgium, and therefore have little of importance to mention on that subject. There are, however, certain oases in this extensive waste, which mark themselves not only by the luxuriance of the crops, but by the cheerfulness of the scenery and the numerous smiling villages. Amongst these the principal are parts of the duchy of the Lower Rhine, the Saale and Helme valleys, a portion of Mecklenburg, and the delta of the Vistula. The culture practised in these districts varies with the locality and the demands of the place. The soil in the valley of the Saale is of fine quality, and well adapted to the growth of barley, great quantities of which are raised, and the grain is unequalled in quality. A plant which is extensively cultivated here, also, is the beet, for the sugar manufactories established in Magdeburg. Great care is bestowed on the cultivation of this crop, in weeding and hoeing it; and a considerable portion of the rural population depend for their livelihood on the employment they get in the cultivation of the beet. The valley of the Helme is watered by a stream of that name, and is passed

through in going from Cassel to Halle. This road is one of the most picturesque in the north of Germany; and a person coming from the sandy flat about Berlin cannot fail to enjoy the scenery, which assumes a new feature at every turn of the winding hilly road. In the fine parts of Mecklenburg wheat is grown in considerable quantities for exportation to Britain. The most of the wheat grown here is shipped from Stettin. It is rich in minerals. Silver to the amount of nearly 4000*l.* is yearly obtained here, while iron and copper are also found. Brown coal is worked and burnt in all this neighbourhood for fuel. It is formed, by means of water, into shapes, in which state it is burnt. But it is the soil which demands our attention. It is of the finest quality, and so rich as to entitle the valley to the name of the *Golden Valley*. It produces very heavy crops of wheat, rye, grass, and oats, which are the principal plants cultivated. The poppy is one of the secondary class of farm produce here. The rotation followed here is—fallow, wheat or rye, grass, oats; and the strength of horses kept on the farm corresponds with that of farms managed in the same way in this country. The farms are small, and the fields uninclosed. But by far the most fertile part of the north of Germany is the delta of the Vistula, which extends for a considerable distance from the banks of the river. It is, however, inconsiderable when compared with the extensive wastes which

skirt it. It consists entirely of alluvial deposit derived from the overflowings and former courses of the river. The soil is a stiff retentive clay, and would be much benefited by the introduction of a good system of surface drainage. The farms are small, and are either occupied by proprietors, or, as is more frequently the case, let to tenants, who club together in villages, which are composed often of nothing but their houses and offices. The great luxuriance of the crops raised with no display of skill is a sufficient test of the fertility of this district. But these rich spots form but an inconsiderable portion of the north of Germany, a very few particulars of the agriculture of which I will now mention.

Agriculture is improving rapidly in some districts of this part of Germany, particularly in the neighbourhood of those towns which have much trade with England in corn; and the consequence is that land is now rising in value. I know of instances where, within the last twenty years, the value of land has been increased to more than double. But there is still great room for improvement. The land is farmed, for the most part, by proprietors whose properties vary from three to thousands of acres, according to the districts in which they are situated. In some localities the farms are all small, in which case the farm buildings are all collected in villages. Sometimes as many as seven or eight compose a village. Farms of this description are to be found near the towns, which they supply with milk. The farm-house and offices are generally connected and under the same roof. This building is oblong, with roofs at the gables as well as at the sides. One end is devoted to the dwelling-house, before which is a patch of ground very neatly laid out as a kitchen and flower garden. The kitchen fire is often on the outside of the wall, which divides the farmer's rooms from the rest of the building, which is tenanted by the cows on the one side, the horses on the other, and the carts and implements are placed between them; while at the end are large folding doors, which close in all the farmer's moveable property. But the generality of the farms are large, and possessed and farmed by a most respectable class of men, many of whom are men of education; and they are all distinguished for their great kindness and hospitality. The house on such farms is quite separate from the offices, and is surrounded generally by an extensive garden. The offices are in the form of a square, inclosing an area in the middle for the accumulation of the manure. They consist of byre, stable, sheep-shed, corn-shed—for all the corn is kept in houses instead of stacks—and servants' houses. The buildings are often erected according to the most approved principles for con-

venience and comfort to the animals. Having mentioned a sheep-shed, I think it necessary to explain its use, as there are no similar erections in Scotland. The sheep are always kept in, in winter, when they get potatoes and hay, and the greater part of summer, when they get clover. Some of these sheds are very large, capable of containing 1500 sheep. There is a walk made along the side of one of the walls, and the area between it and the other wall is divided into compartments, by means of railings, designed to hold a certain number of sheep; each of these divisions is furnished with a rack for the hay and clover, and troughs for ground food; and a small gate leads from the side walk to each division, so that the keeper can supply the different lots with food, and inspect them without much trouble or disturbance to the whole flock.

The principal grain cultivated in the north of Germany is rye, of which there is said to be eight times more grown than of wheat, for which the soil, being in many places bare sand, is not at all adapted. The black rye bread is the principal food used by all the poorer classes, and in Westphalia it is to be found on the tables of rich and poor, and there goes under the name of *pumpernickel*, which was given to it by the French, on their march to Russia. Potatoes are now largely cultivated, and flax and buck-wheat form in some cases a part of their produce. The triennial rotation is still prevalent all over Germany, which shows at once the backward state of agriculture. Fallow, or potatoes, or flax, is the first year of the rotation, (turnips are never raised but in gardens,) then wheat or rye, and lastly rye or oats. The oats grown are in general very bad in quality. This is the prevailing system; but we shall immediately advert to a course adopted where agriculture has undergone every improvement, which is producing rapid changes on the face of the country; for where, in Pomerania—the most barren spot in Europe—the road from Stettin to Danzig lay through a healthy waste a few years ago, it is now, retaining its former line, skirted by healthy crops of rye, potatoes, and some fresh fields of grass.

The following sketch of the management of a farm ten miles from Danzig will give one some idea of the system carried on among the most intelligent farmers there. This property consists of 1400 imperial acres, which is all arable but a very small part. To work it 36 horses and 60 oxen are kept throughout the year, 4 horses or 4 oxen being used for one plough. The horses are small, and in general not in first-rate condition. For this property, including land, houses, animals, and implements, the gentleman paid 8,400*l.*, which may be considered a fair estimate of the value of land and

agricultural property in that district. His rotation is—1st, fallow; 2nd, wheat or rye; 3rd, grass for two years; 5th, fallow, potatoes or peas, 6th, wheat or rye, 7th, oats. Rye is the principal produce, but he also grows a considerable quantity of wheat. The potatoes are grown expressly for his family, servants, and as winter food for his animals. He only kept as many cows as were necessary to supply his own family and the hinds with milk. One man is kept for each team of horses or oxen, which is driven when in the plough by a boy. The ploughmen receive 6d. a-day, out of which they must clothe and feed themselves, a house being provided for them. The women get 3½d. a-day, and girls 2½d., out of which they must provide themselves with the necessaries of life. These are the highest wages given to farm-labourers in that locality, and, no doubt, will startle one who has never considered the question before. The first question that will be asked is, “How can they live on such a pittance?” which is best answered by mentioning their dietary. In the morning the labourer gets rye-bread and milk; in the forenoon, potatoes with such *kitchen* to them as they are enabled to obtain from one pig they *sometimes* fatten during the year; in the evening, either bread and milk or simple rye-meal brose. The German labourers are very slow at work, and do much less than is commonly expected from the same class in Scotland.

With such low wages, and with such a low value of land, it will be readily seen that they are enabled to sell their produce for very little and at no loss. The gentleman to whom the property above described belongs, was selling his wheat when I saw him at 31s. a quarter; and I understand that the farmers can afford to sell their wheat and carry it to the ships for 30s., without a loss, while they consider themselves amply remunerated for every expense attendant on the raising of a crop of wheat at 35s. a quarter. The merchants in Danzig generally allow 6s. 6d. a quarter, as a fair average for freight, insurance, and other incidental expenses from that port to England. Therefore, wheat grown in the north of Germany can be sold in an English market at 41s. 6d. the quarter, with a sufficient profit to the German cultivator.

I will mention here a visit I paid to a potato distillery near Danzig, where potato whisky, or, as it is called in this part of Germany, brantwein, (that is, brandy) is made. The distiller possesses a farm also of 600 acres, of which 300 acres are always in potatoes, and the other half in rye. He dungs the land at every crop of potatoes. He has 40 horses, besides oxen, employed on his farm, and 120 cattle tied up to fatten. The number he will fatten de-

pends on the condition in which he ties them up. He showed us one, nothing but skin and bone, which would take six months to fatten. The whole of the animals—horses, cows, sheep, pigs—were fed on the refuse from the distillery as part of their food, and the fattening animals got nothing else. His method of making manure is deserving of attention. He first puts down the rough dung, on this a layer of good earth, and then a layer of marl, and the whole is steeped in the urine from the stables and byres. Immense quantities of manure are thus made. The potatoes are never hand-hoed, but are planted so far apart as to admit of a plough passing between them longitudinally and transversely. Wages are low here. Men get their meat and from 4l. to 5l. in money in the year. The whole of the potatoes grown on his farm are employed in the distillery. They are first boiled, and then crushed, and malt added. It is put out after this upon a level, and mixed with ice, to cool it more rapidly, and the mixture sinks down to a cellar, where it ferments, after which the operation of distillation is performed. 150 bushels of potatoes are used daily, and 180 gallons of whisky made at this season, but in winter considerably more. He obtains 10,000 quarts of refuse from this distillery daily, and each feeding cow gets from 100 to 120 quarts. The produce of 10,000 quarts must be meant for the *present* season, as he could not feed so many animals as he mentioned if 10,000 were the yearly average. The whisky sells for about 3d. a bottle.

Holland.—Having completed my tour in Germany, I sailed down the Rhine from Dusseldorf, and set foot first on Dutch land at Arnhem. Holland as a nation is quite unique, and ought to be visited by every Scotchman who wishes to see a country in every respect the reverse of his own. When viewed from the sea, the coast of Holland is marked by a dark unwaved line in the horizon, and the villages, seen to their very foundations, rise in bold relief on the clear blue sky. The tourists who annually traverse countries and continents are induced to visit most places, either from their possessing natural beauties and attractions, from their fame in history, or from containing within them objects hallowed by antiquity, celebrated works of art, or abundant sources of amusement and pleasure; but Holland, besides holding out all these inducements to a traveller, excepting what is natural, of which there is no true exemplification to be found in it—for even what was originally natural has been made to assume an artificial appearance,—possesses much that is far more attractive to him, as he can nowhere meet with the same or similar objects of attraction. It invites the mere novelty-seeker; for there he will find the most of

the land in the kingdom reclaimed from water; he will be placed in the awkward position of knowing that he is there entirely at the mercy of the waves, which rage without the barriers thrown up to oppose their progress, and make the most vigorous efforts to regain their former dominion. He will see everything different from what he is accustomed to find anywhere else—houses in the busiest and most smoky towns as clean as if the painter's brush had just been removed from them for the first time; streets unspotted by mud; trees painted in the gaudiest colours, and clipped into the most fantastic forms; every town, every province intersected by canals, many of which are below the level of the sea, with which they are in connexion; and a people delighting to spend their pleasure moments over stagnant and fermenting ditches, from which rise the most noxious vapours and the most offensive effluvia. It invites the philosopher; for there he can see his laboratory experiments in hydraulics brought to a practical and useful end, and carried on on the grandest scale ever projected by man; he can see also the existence of a kingdom dependant constantly on the minute calculations of men of science. It invites the historian; for there he will tread on many a spot hallowed by individual acts of self-devotion to the cause of patriotism. He will be reminded in many a city of former displays of unrivalled national valour, and of the most dreadful sacrifices made in defence of liberty and country, preferring death, and even the destruction of their country, to the yoke of an invader. It invites the artist, to judge, criticise, and admire the works of its children, many of whom are excelled by none in the world. It invites the agriculturist, and with pride bids him walk over its once sub-merged fields, now covered with the richest luxuriance, visit its once moving sand-hills, which it has fixed in their present position, and turned to profitable account by an attentive observance of the laws of nature; examine its system of draining, in which it has rendered one element subservient to its will in overcoming another and more dangerous; bids him enter its dairies, and follow the example there shown him of cleanliness and comfort to the animals under his care.

The first place in Holland I went to visit, connected with agriculture, was the agricultural colonies at Fredericksoord and Willemsoord. They were established when, after two years of great scarcity, a large proportion of the population were reduced to absolute destitution, and depended entirely for their subsistence on the charities of their more fortunate countrymen. So prevalent did the practice of begging become, that it was found necessary to do something to relieve those unfortu-

nate men who were willing but unable to get work. A society was, therefore, formed by a few benevolent individuals, the object of which was to give employment to men in this deplorable condition. In carrying out their purpose, they conferred not only an immediate and lasting benefit on the individuals in question, but effected great national advantages—first, by stemming the spread of vice, which would have been the natural consequence of such destitution, and, in the second place, by increasing the national resources in converting to arable land a waste on which even a sprig of heather was scarcely to be met with. Such was the origin of these colonies twenty-four years ago. And no one can travel the road along which they are situated without noticing the great change that has been effected on the face of the country by their establishment; and the change is doubly observed when we pass from the unimproved waste to the neat cottages which line the road. From a wild barren country we enter at once a little oasis which bears every mark of prosperity; neat cottages, betraying the Dutchman's taste in their clean appearance, crops as luxuriant as if nurtured by a better soil, and gardens stocked with useful vegetables and adorned with a variety of flowers. Each house is placed at the road side, in the middle of the plat belonging to it, and directly opposite to another on the other side of the road. The buildings are all in one, the part allotted to the cow and pig being built of wood, and the cottage of brick. In the cottage are two rooms: one of them is large, and answers the purpose of kitchen, dining-room, and bed-room for some of the family; the other is small, and contains only a bed at one end, and at the other a closet, which answers the purpose of a milk-house. Great attention is paid to the dung, which is put up into neat heaps at the back of the house, consisting of alternate layers of turf and manure from the byre, and watered every now and then by the liquids previously collected from all the houses, in a cask sunk in the ground. In Willemsoord, which is the smaller of the two colonies, there are 176 such houses, all tenanted by paupers but six, whose occupiers pay rent for their farms. The quantity of land attached to each house is about seven acres imperial. The colonists are all supplied with implements on entering on their plat, besides a cow and pig. The food of the colonists is, for the most part, potatoes, and rye-bread, with milk, little or no flesh being used. The small farmers pay 3*l.* 15*s.* a-year for their plat, but the whole produce of the colonists' land is taken to the general magazine. There is a regular creditor and debtor account kept with them from their first entering the colony. Everything they receive on entering is marked down against them; and when-

ever they are enabled to pay off their debts from economy of living, they are allowed to rent their plots. Some have succeeded in this; but the instances are rare. The scheme is not to be looked at in the light of a speculation; for, as such, it was never intended: but it has sufficiently succeeded in the object for which it was designed, viz., the relieving of the destitute, besides the consequent advantages referred to before. Attached to these colonies are others of a penal character, to which unruly members are sent and subjected to more rigorous laws than are necessary in the free colonies. The wages and rations allotted to them are as follows:—Suppose a family of eight individuals, husband, wife, and six children, three of whom, with their father, work; the other three go to school, while the mother remains at home. The sums set down for wages here are only imaginary, being somewhat higher than they are generally allowed.

Per week.

Man at 10d. a-day,	£0 5 0
Son at 10d. a-day, and other two at two at 2s. 2d. each per week	0 9 2
	<hr/>

Wages earned for whole family per week . . . £0 14 2

From which is deducted—

per week.

Winkel geld	£0 5 4
Bread, potatoes and clothing for eight	0 8 0
	<hr/>
	0 13 4
	<hr/>
	£0 0 10

Which is put down to their future emergencies.

By winkel geld is meant money for buying little necessaries, such as coffee, tobacco, &c.: the allowance of it for each person is 8d. a-week. The allowance for bread, potatoes, and clothing is 1s. per week for each person. The only crops grown by the colonists are rye, potatoes, and grass. The farmers grow what they choose. There are several overseers who superintend the work done in colonies. Attached to them are schools for the gratuitous education of the children, and also workshops in which they are taught some useful trade. I passed one of these shops, in which there were from thirty to forty looms worked by the children; and adjoining it was another room, where some were engaged in spinning, mending shoes, and other occupations. I was attracted to the place by the busy clatter of the shuttles and sounds of music which proceeded from it; and, on coming up to it, found them engaged at their respective occupations, cheering on one another in their work by a song, in which they all joined. What health, what

happiness shone in these pauper children's faces! Their looks were a sufficient proof of the benefits derived from such an institution.

Is the establishment of such societies impracticable in our own country? Are there not thousands of unimproved acres, that have been condemned as useless, many of which exceed in fertility the waste in which the Dutch colonies are situated? Are there not hundreds of unemployed hands who crowd our poor-houses and pauper-rolls, who frequent our roads and streets as mendicants, who haunt our lanes as degraded miscreants, advancing their poverty as a palliation of their vices and crimes? Is there not money raised to relieve the destitute? And are there not many benevolent individuals who, by the gratuitous bestowment of their charity, encourage idleness and foster vice? In Britain, truly, we have the elements for such a society; but we want some master spirit to bring them together, and put them into operation. It is a subject that cannot be too strongly pressed upon proprietors of land as the best way of improving the waste portions of their properties, and of reducing, at the same time, the burdens with which their cultivated lands are so heavily taxed.

I shall now detail a short trip I had through North Holland, in which I visited some of the farms where the celebrated Dutch cheeses are made.

The route I took is one that every person wishing to obtain in a short time a knowledge of the characteristics of Holland and the Dutch ought to take. But I will put him on his guard against the extortionary habits of the people, which will be very apt to throw him into bad humour, and thus mar the whole pleasure of his journey. When he reaches some of the towns in North Holland, he will be called upon to pay most exorbitant charges for the simplest meals and dishes, unless he should take the precaution of bargaining with the innkeeper before hand. The poorer classes in Holland will not perform the slightest favour for a stranger without expectation of some recompence. And people there will expect and take a gratuity from a visitor, which a person of the same class in Britain would spurn at as a breach of hospitality. I allude to the small farmers.

By means of ferry and trekschuiten, we arrived at Buiksloot from Amsterdam. The first part of our road lay along the banks of a canal, indeed on one of the dykes, for the roads here are often made on the dykes, so that we have a good view of the extended flat which is stretched out on both sides of the canal, with the surface all intersected by ditches, but covered with a luxuriant sward of grass, excepting where it is replaced by rushes in the wettest spots. The farms in the first district

we passed through are all tenanted by farmers, who are allowed to remain on the ground as long as they are regular in the payment of their rents. The men who occupy them are, in general, possessed of little capital. The farms are from seventy-five to eighty acres in extent. The price per acre is 33s. 4d. The number of cows kept varies from thirty to thirty-six, according to the soil and the management. The one half of the farm is kept for pasture, and the other for hay. They are very careful of the dung about the place, and put it on when thoroughly rotted. This, with the submersion the fields get in winter, is all the return made for the good it does the farmers. The cows are beautiful, and kept in the finest order; indeed many farmers seeing them would be apt to consider them too fat to give milk. They are black and white, and many of them are marked like the sheeted breed of cattle, the colours being black and white instead of brown and white, as in the latter. They are very small in the bone, have small heads, thin necks, and capacious carcasses, with large udders. This is the description of cattle found all over Holland. The interior of the farm-places show all the neatness and cleanness generally spoken of by writers. When the door was opened for me to enter, I felt more inclined to undergo the process of purification than the worthy doctor did before entering the sacred temple of Juggernaut. We went through the byre first, which is unfrequented at the present season by its accustomed inmates. It is divided into stalls for two cows each, every piece of wood about which bore evident marks of hard scrubbing. Many a dining-table is not so clean as was the floor of this cow-house. In all the stalls there is a layer of clean shells, as level as the newly-gravelled walk which leads to some lady's bower. At the top of the stalls a trough built of bricks runs along the length of the byre, from which the cows drink water; and over each stall, attached to a beam in the ceiling, is a ring to which the cows' tails are tied up when they are in the house. A door opens from the byre to the milk-house where the cheese is made. This shows the same cleanness as the cow-house. Thence we went into the cheese-salting room, where they are kept in pickle or salt for ten days. We were led through a door-way which opened from the byre to the winter-kitchen. Three sides of this room were papered, and the fourth, as well as the fire place, was adorned with square pieces of porcelain of different colours. Instead of having a grate, a large metal plate is placed on the hearthstone, and extends for a good way into the room: under it is placed some live coal; and in the winter nights, when the waves of Zuyder Zee roar without,

the family sit round the blazing faggot with their feet upon this heated plate, and talk over the events of the day. The walls of the room are hung with Roman Catholic engravings, while the floor is all matted. We were shown into other two rooms, the one a bed-room and ordinary parlour, the other a parlour; used only on particular occasions. These were also matted on the floor, excepting the centre, where the well-cleaned slabs of marble were exposed to view. The walls were similarly adorned, and two or three handsome oaken cupboards and drawers were placed in the most convenient part of the room; while in the principal parlour a table stood in the middle, with a nice set of tea-things, all arranged, from the well burnished heater to the silver spoon. The following particulars I obtained from the farmer's wife, about their method of making cheese:—After the cows are milked, and before the milk is cold, the rennet is added, till the curd is thoroughly formed. The whole milk is used for this purpose but a little, which is kept for cream. After the whey is separated from the curd, the latter is put into the *chessards*, which are of round form in the interior; and the cheeses remain under the press for four hours. The press is of the simplest form, being a beam used as a lever, with a weight at the end. It is in general gaudily painted and gilt. The cheeses are then removed from the press, and put into a pickle of salt and water, where they remain for twenty-four hours. From the pickle, they are put into cups made of wood, and salt is sprinkled on the tops of them; they remain here eight days, being turned every morning upside down, and clean salt added. At the end of the eight days they are put into the pickle again for twenty-four hours. After this, they are taken out, and allowed to dry for three weeks; linseed oil being rubbed on them every day, to prevent the cracking of the crust. They are generally sold at the end of this period. The practice of pickling prevails only in this district, which is called Brucker Meer. This part of the country has not been reclaimed from lakes, like the Beemster and Purmer, or, if it has, it is not in the memory of man. The soil is of inferior quality, and the cheeses made here are not esteemed so good as those made in the other two places. In them they allow the cheese to remain two days longer in the salt, instead of putting it into the pickle. The cows are never brought in in summer; in winter they are fed on hay and water, and some farmers give oil-cake. A few pigs are also fattened from the whey, which is churned before being given to them. More people are employed on these small farms than would at first sight be thought necessary. This is owing to the expedition required in the operations. Cheese is made twice a-day on all the

farms; and from eighteen to twenty are made daily, from thirty-two cows, at the height of the season. The men's wages are from 6*l.* to 10*l.*, with their meat, some perquisites, such as calves, and 1*l.* twice a-year as presents at fair time and Christmas. Women receive 6*l.*, with their meat.

Thence we proceeded to Brock, about which most authors have spent their powers of exaggeration. The houses are built of wood, and painted green. The front doors and windows are never opened but on three occasions—a marriage, a birth, or a death. The streets are paved with clinkers or small bricks, which in some places are of different colours, probably giving rise to the idea of Mosaic, so often spoken of by authors. Carriages or horses are not allowed to pass through the streets. The gardens have all the absurdities of the Dutch taste about them. After a short drive from Brock, we enter upon one of those drained lakes so frequent in Holland, called the Purmer. In passing through them, we are placed in a very curious situation. The same level surface, dotted over with innumerable farm buildings, built in exactly the same manner, with an exact number of trees about them, with gardens laid out in exactly the same style, containing the exact number of cabbage plants and flower stalks, meets the eye in all directions, inclosed as its boundary by a high bank, on the other side of which a boat may be seen far above our heads, with distended sails, scudding along the waters of the canal. Assuredly we ride under the keels of the vessels, and the industrious inhabitants of these parts as truly dwell under the water. The farms in the Purmer are marked off by gates, and the subdivisions of each farm are made by ditches. After an hour's drive through the district, we arrived at Purmerende, where, fortunately, the great North Holland weekly fair was held that day. It is amusing for a stranger to walk through the streets at the time. He sees the people in their peculiar costumes, from the wide pantaloons and docked tail-coat to the court dress and cocked hat, with glittering buckles on the shoes. The women also do not fail to attract our attention, from their brilliant gold head-dresses, and bunches of silk curls over each temple, which are sported by all ages of the sex. The cheeses when sold are carried to the weighing-house by a class of porters who run with their loads, roaring most vociferously all the way, to give warning of their approach to the bystanders, who meet with no civility from them if they obstruct their passage. The immense number of cheeses weekly sold here may give some conception of the number of people employed in making them. The passage in one part of the town was quite blocked up with the heaps which lay in rows

along the streets, each heap containing about fifty cheeses.

About five miles' drive from Purmerende brought us to the Beemster. The most careless observer can be at no loss to mark the commencement of this fertile tract of land. We pass at once from rank marsh vegetation to the most splendid fields of grass, surpassing in healthiness and beauty the best swept lawn of an English nobleman. We stationed ourselves on the top of the dyke, the only eminence near us, and surveyed with no little pleasure the novel but not uninteresting scenery before us, the effects of the patient industry and untiring perseverance of a people whose country may be said to be the most remarkable in the world. As far as the eye could reach this level tract of land extended, richly green and unwavering on its surface, which was studded with innumerable farm houses, each surrounded with its well-pruned trees; and all around the gigantic windmills extended their arms to catch every passing breath of wind, while the whole prospect was enlivened by the handsome herds which fed in quietness on the rich herbage which the soil produced almost spontaneously. The farmers in the Beemster are many of them proprietors, and therefore we find in some parts of it more appearance of wealth, in the substantial houses and in the extensive and elegant gardens which surround them. The farmers' premises in these districts are generally all connected, and under one roof. The form of the buildings is that of a square, with a low sloping roof at each side, which nearly reaches the ground, with now and then a small building jutting out from one of the sides.

The extent of North Holland is eighteen miles square, and it is kept dry or drained by forty-two windmills. Sometimes four or five windmills will be seen placed close to one another, raising the water from different levels, or, where there is a dead level, producing a run in the water, so that the working of the windmills may not be impeded. On coming out of the Beemster, we enter the Woermer, which is another drained lake, but far inferior to the Beemster in value. At one end of this extensive meadow lies Woermeer Veer, which is a small village, and with Keoch, Sandyke, and Saardam, forms a continuous street about four miles long. There is a canal at Woermeer Veer, and considerable vessels sail in it; but still it betrays no symptoms of the filthiness to be found generally where there is much loading and unloading. On leaving the canal, the road, which is narrow, and paved with clinkers, and as clean as the floor of any gentleman's lobby, runs between, on the one side, a row of beautiful cottages, for the most part built of wood, and painted light green,

with gable fronts which terminate in a spire, and windmills, all having the appearance of being built yesterday, gaudily adorned with the most glaring colours, and gilt, and thatched on the sides instead of being built of wood, but so neatly, as to look like one solid mass, instead of millions of straws bound together; and on the other a row of trees shading the road, a stagnant water, which is spanned in the length of these villages by no fewer than 500 small bridges, all similarly adorned as the houses, then another row of cottages, surpassing those on the other side in their whimsical embellishments, while every now and then we pass gardens, abounding in every variety of flowers which the fortune of the possessors would enable them to purchase, and laid out with walks, which are paved with small stones and shells of different colours, and arranged into an endless set of fantastic forms. Such was my route for half an hour, till I reached Saardam, where Peter the Great learnt the art of ship-building. From Saardam our road lay along the top of a dyke, which restrains the waters of the Y to their proper bounds. The mills in this neighbourhood, which are more numerous almost than the houses, grind tobacco, crush linseed, and make paper. In an hour after leaving Saardam we were in Amsterdam, highly gratified with what we had seen during the day, and more than ever impressed with the unwearied perseverance of this people, and of their almost faulty habits of cleanliness.—P. M'L.—Journal of Agriculture.

PROBUS FARMERS' CLUB.

BONE MANURE.

At the last meeting of the members of this club, a paper on the "Analysis of the Soils of Carnwinick Farm"—the property and in the occupation of T. H. Hawkins, Esq.—was read by Mr. Karkeek, of Truro. Its object was to prove the durability of bone-dust as a manure for a period of 10 years. It appears that, in 1835, a piece of waste ground was broken from the common, and tilled to turnips, the larger part of which was manured with bone-dust, at the rate of 3 quarters to the acre. In the two following years, it was successively cropped with oats, and with the last crop laid down to permanent pasture, in which state it has remained ever since. At the present period, the effect of the bone-dust can be plainly distinguished on the grass as far as the eye can reach, having a rich grass sward—whilst the adjoining part, where no bone-dust had

been applied, has a coarse sterile appearance; the difference being as great as if a line had been drawn between rich pasture and scanty coarse herbage. This, and a great many other experiments of the same character, made by Mr. Trethewy, the manager of the estate, amounting altogether to 120 acres, and on all of which the effect of the bone was equally visible, induced the club to send a sample of the soil from each part of the field on which the first experiment had been made to Mr. Hunt, late of Falmouth, and now "Curator of the Museum of Economic Geology;" to be analyzed, in order to ascertain if the bone could be detected at the present time. It should be observed that Mr. Hunt was kept altogether ignorant of the object of the club, and that the result was perfectly satisfactory, inasmuch as he readily detected the bone in that portion of the field on which it had been applied some ten years before. The following are the analyses:—

	No. 1.	No. 2.
Water, evaporated by stove drying	14.06	14.18
Vegetable and animal matters burnt off	12.01	12.05
Silica and siliceous grit	49.54	49.50
Oxide of iron	7.30	7.00
Carbonate of lime	1.05	1.06
Carbonate of magnesia	0.25	0.35
Sulphate of lime	1.05	1.04
Muriates	0.54	0.54
Alumina	7.10	6.04
Phosphate of lime	0.10	0.75
Phosphate of magnesia	0.00	0.05
Potash	1.00	1.27
Humus and soluble alkalies	6.00	6.17

Mr. Karkeek contended that the experiment went to prove that the chief manuring principle of bone-dust exists in the phosphates of lime and magnesia. It also set to rest the question whether the principal manuring properties of bone exist in the earthy matters, which constitute about two-thirds of bone, or in the oily and glutinous parts constituting the remaining one-third. An interesting discussion ensued on the subject of the analyses, the club being of opinion that the organic parts of bone evidently had a powerful effect as a manure, but that it was next to an impossibility that any other than the earthy matter could have remained so long in the land—the whole of the animal matter having been probably consumed by the two crops of oats; and they agreed with Mr. Karkeek that the principal manuring properties of bone existed in the earthy phosphates.

STEW PONEY FARMERS' CLUB.

The second annual meeting of this club was held at the Stewponney Inn, on Tuesday, Dec. 9, when the following members were present:—Lord Lyttelton, J. H. H. Foley, Esq., Mr. Yardley, Mr. Corbett, Mr. Windle, Mr. Thompson, and Mr. Beddard. On the motion of J. H. H. Foley, Esq., seconded by Mr. Yardley, it was unanimously resolved, "That the thanks of this meeting be given to the chairman, vice-chairman, secretary, and committee, for the past year, and that they be requested to continue their services for the year ensuing." The accounts were then produced by the secretary, and approved. The different subjects for discussion during next year having been arranged, Mr. Foley was requested to draw up the annual report of the club, and to cause copies of it to be printed and distributed as usual. The business then terminated.

STEW PONEY AGRICULTURAL SOCIETY.

The annual general meeting was held at the Stewponney Inn, on the same day as above, when there was a good attendance of members. The chair was taken by Lord Lyttelton. The accounts of the past year were examined and audited, and the premiums fixed for the ensuing one. On the motion of J. H. H. Foley, Esq., seconded by Mr. Windle, W. W. Whitmore, Esq., was elected president of the association. The committee were re-elected: and John Joseph Bramah, Esq., of Ashwood House, was also elected a member of the association.

The Lecture.

At two o'clock, A. Gyde, Esq., M.R.C.S. E., of Painswick (consulting chemist to the society), delivered an extremely interesting lecture "On the application of physiology to the rearing and feeding of cattle." The lecturer was listened to throughout with marked attention. He said:—

Twelve months have now elapsed since I first appeared before you in the capacity of consulting chemist to your society, on which occasion I explained the composition of soils, and their influence on vegetation. It becomes my pleasing duty this morning to consider another link in this beautiful chain—the connexion of the vegetable with the animal kingdom—and to offer some observations on the application of vegetable physiology to the rearing and feeding of cattle. But, before entering on the immediate subject, it will be necessary

that we possess a clear conception of the elements of animal nutrition. The vegetable on which the animal is fed consists of an organic and inorganic portion; the former is supplied by water, carbonic acid, and the salts of ammonia and nitric acid; the latter is obtained entirely from the soil, and consists of the various earthy and saline constituents which constitute the ash of plants. These substances are taken into the texture of plants by their roots and their leaves, and under the influence of light are decomposed—the oxygen being returned to the atmosphere, while the carbon, with the elements of water, forms starch, gum, sugar, or woody fibre, or, with the addition of the elements of ammonia or nitric acid, constitute gluten, albumen, or casein. Hence the plant obtains its food from the inorganic kingdom; while the animal, on the contrary, is only capable of existing on organized matter.

The recent discoveries in organic chemistry, and more particularly in its application to the physiology of animal life and nutrition, has thrown much light on this subject. It has explained in the most satisfactory manner why one article of diet is more nutritious than another—why the Greenlander should devour large quantities of train oil with his daily food, while the same diet would not only be disgusting but positively injurious to an inhabitant of a warmer climate—why animals cannot be sustained on starch, gum, or sugar alone, or on gelatine alone, and yet these substances combined constitute their daily food. Chemistry has pointed out the particular requisites of the animal body, and how these are supplied in the food we eat. It has shown that the animal, like the vegetable, consists of an organic portion constituting the soft parts of the body, and also of an inorganic portion, which principally exists in the bones, forming the skeleton; these substances in the herbivora being obtained directly from the vegetable food on which they live, and in the carnivora from the flesh and blood of the herbivora.

If we examine any article of food, such as wheat, cabbage, beans, or turnips, we find that, in addition to water, it contains gum, starch, or sugar, with woody fibre, and a very small portion of fatty matter; these constituents being composed of three elements only, viz., carbon, oxygen, and hydrogen, united in nearly the same proportions. But we also find there are substances in vegetables which contain nitrogen, in addition to the elements of

gum or starch, and are known as gluten, vegetable albumen, and casein. If, for example, we take wheaten flour, and mix it with water into a paste, and then wash it on a sieve by pouring a stream of cold water over it, while it is kneaded with the hand, the starch, gum, and sugar of the flour will pass through the sieve mixed with the water, and there will be left on it a tenacious stringy substance like birdlime: this is the gluten of the wheat, and which, when dried, becomes a brittle mass, not unlike horn, and emitting the same odour when burnt as burning feathers, horn, or any other animal substance. The casein which is obtained from beans or peas, or the vegetable albumen and fibrine from the expressed juice of the carrot, turnip, or cabbage, possess similar properties with that of wheat, with this single exception, that they are soluble in cold water, whereas the gluten from wheat is insoluble in that fluid. When these substances are submitted to chemical analysis, they are all found to be of the same composition, and further, that they are also identically the same as the flesh and blood of animals; this identity does not only consist in their containing nitrogen or azote, with carbon, hydrogen, and oxygen, in the same proportions as it exists in the flesh and blood of animals, but it extends to a small portion of sulphur and phosphorus, which is also found to be associated with flesh in the animal. Hence we find the flesh and blood of the animal ready prepared in the vegetable. The vegetable prepares and elaborates out of the elements of water, ammonia, and carbonic acid, constituents which are identically the same as the flesh of the animal; and the animal has only to apply them to its own individual use.

The following table will show the identity of composition between these substances:—

	Gluten from Flour.	Casein from Peas.	Ox Blood.	Ox Flesh.
Oxygen . .	22·4	23·0	22·2	22·3
Hydrogen . .	7·5	7·2	7·5	7·5
Carbon . .	54·2	54·1	54·3	54·1
Nitrogen . .	15·9	15·6	15·8	15·7

All animal bodies are continually undergoing change; every thought, every motion, is performed at the expense of a portion of the body, and hence arises the demand for food to supply that waste. This fact is strikingly illustrated in animals that undergo much severe fatigue, when compared with those that use but little exertion. The horses used to draw our well-appointed coaches, which are now rapidly disappearing before the gigantic powers of steam, are almost exclusively fed on oats and beans, two of the most nutritious of all vegetable

food; while horses performing less laborious work will supply the natural waste of the body from the small quantity of gluten contained in hay or clover.

The food of animals, I have stated, consists of two distinct classes of matter: one containing nitrogen or azote as one of its constituents, and which is identical with the flesh and blood of the animal; the other devoid of nitrogen, and consisting of gum, starch, or sugar, with woody fibre. These different substances serve two very distinct purposes in the animal economy—the former, or nitrogenous constituents, supply the wastes of the tissues of the body, and may be termed the elements of nutrition: the latter, or non-nitrogenous constituents, supply fuel for combustion in the lungs to keep up animal heat, and under some circumstances also contribute to the formation of fat. These elements may be arranged under two heads, viz:—those of nutrition, and those of respiration.

Elements of Nutrition.	Elements of Respiration.
Gluten	Gum
Albumen	Starch
Casein	Sugar
Flesh	Oil or Fat
Blood	Alcohol.

The former of both these elements exist in combination in all substances capable of supplying food to the animal; but, before they can minister to its wants, they must undergo the process of digestion; that is to say, they must be rendered soluble and capable of entering the blood. This is accomplished in the following manner:—The food, when received into the mouth, is broken down by the teeth, and mixed with the saliva secreted by glands situated near the angle of the jaw, and under the tongue; when properly masticated, it is collected into a ball at the base of the tongue, and by the act of deglutition is carried into the stomach to undergo the process of digestion.

Independent of the fact that the saliva, when mixed with the food, renders the digestion of it more easy, Liebig supposes that it has the peculiar function of inclosing air, as froth, the oxygen of which enters into combination with the constituents of the food, while the nitrogen is again given out by the lungs and skin; he also believes that the rumination of some animals, as for instance the ox and the sheep, has for its object a renewal and repeated introduction of oxygen into the stomach. When the food has entered this organ, the process of digestion, or the solution of certain of its constituents, commences; this is accomplished by a fluid secreted by small glands, situated between the coats of the stomach, and known as the *gastric*

fluid; it consists of mucus mixed with *free hydro-chloric acid*, and a peculiar principle known to chemists under the name of *pepsin*.

Hydro-chloric acid is always present in the stomach, and is obtained by the decomposition of common salt (which is composed of hydro-chloric acid and soda), the acid assisting digestion in the stomach, while the alkali (the soda) enters into the formation of bile. Thus a certain quantity of salt is necessary to digestion in animals; and although it forms a constituent of the ash of vegetables, still it seldom exists in sufficient quantities to supply the requisite quantity of acid or soda required for healthy digestion, and therefore salt ought to be placed within their reach. The instinctive avidity with which animals seek salt, points out its necessity as part of their daily food. Pigeons are known to fly from great distances to the sea-coast for the purpose of obtaining it; and a very common mode of seducing one's neighbour's pigeons is by placing a ball of salt, formerly called a salt-cake, in an empty dove-cote: this practice is especially forbidden by an act of parliament still in force. From the stomach the digested food passes into the small intestines; here it receives the secretions from the liver (bile), and from the pancreas (pancreatic juice); and, from the surface of these intestines, the dissolved portion capable of supplying the body is removed by small vessels known to anatomists by the name of *lacteals*, from the fluid usually contained in them having a milk-like appearance; these vessels have numbers of mouths thus opening on the inner surface of the intestines, from which they convey the fluid thus prepared, and which is known by the name of *chyle*, into a tube lying along the left side of the spine; and passing upwards through the chest, it ultimately discharges its contents into the subclavian vein, on the left side of the body. Here it becomes incorporated with the blood, and with it is conveyed into the right cavity of the heart, from whence it passes to the lungs, where it undergoes those changes fitting it for the nutrition of the body.

In ruminating animals, as the ox and the sheep, the process of digestion differs a little from the foregoing; these animals have their stomachs more complicated, to enable them to extract the nourishment from the food, which, as in the case of grass, contains but little when compared with the bulk.

In these animals the grass is cropped with the fore-teeth, and after receiving a very slight mastication, is swallowed; this process is continued until the first stomach is filled, when the animal lies down, and commences rumination. In the first stomach, the food is mixed with secretion, similar to saliva; and in this state it is injected into the mouth in detached portions, to be perfectly mas-

ticated, and when swallowed a second time, the food passes into the second stomach, or *omasum*; from this it passes into the third stomach, or *abomasum*; in the two last the food undergoes preparatory changes, when it is carried into the fourth, or true stomach; here digestion is completed, and the food passes onward into the intestines, undergoing the same process as before described. Blood, formed either from flesh, as in the carnivora, or from vegetables, as in the herbivora, is of the same composition; it circulates through the different organs of the living animal, and supplies the waste which is continually going on in the animal frame; it deposits bony matter for the growth and maintenance of the skeleton; muscular fibre for the muscles; from it the various secretions necessary for healthy existence are separated, and it supplies carbon to the lungs by which animal heat is kept up, with fat to be deposited in the tissues as a store to be drawn upon should necessity compel it; it is the true moving power of the animal machine, and food is its fuel.

Hitherto we have only spoken of that part of the food from which flesh is formed, viz., the casein, albumen, and gluten of the vegetable. We will now consider the purposes served by the starch, gum, and sugar, or the oil or fat, which constitutes so large a portion of the food of man and animal. All animals have a temperature far above that of the surrounding air; this increased temperature is called the animal heat, which, in our domestic animals, averages about 100 degrees of Fahrenheit's thermometer, and is maintained the same under all circumstances, whether we inhabit the frozen regions of the north, or live under the burning heat of a tropical sun.

This heat has its origin in the body, and is caused by the chemical union or combustion of the elements of the starch, and other non-nitrogenous constituents of the food, with the oxygen of the air received into the lungs during inspiration, and also by a portion which is absorbed through the skin.

The atmospheric air when received into the lungs consists of 21 parts of oxygen and 79 parts of nitrogen, with a very small quantity of carbonic acid gas; but when expelled from the body, the nitrogen is found to have undergone but little, if any, change, while the oxygen has in a measure disappeared, and has been replaced by a volume of carbonic acid gas, and a little watery vapour; this chemical change being accompanied by the production of heat in proportion to the carbon and hydrogen consumed. The heat thus produced is caused by precisely the same chemical action as that which causes the combustion of wood in a stove, or the fat of a candle or lamp; and the pro-

ducts are identically the same: the carbon and hydrogen of the food combine with the oxygen supplied by the air, and heat is generated in the body in proportion to the quantity consumed. In the stove or lamp the same changes occur, the fuel being composed of the same elements which enter into the composition of the food; and the products of the combustion are the same, the combination being less energetic in the body than in the stove or the lamp.

In a full-grown man, if we subtract the weight of the carbon disengaged in the excretions from the weight of the carbon contained in the food consumed in twenty-four hours, we find the remainder to amount to about fourteen ounces, which is assimilated with the components of the body; the weight of the body, however, does not increase, fourteen ounces of carbon requiring thirty-seven ounces of oxygen* for its transformation into carbonic acid, which escapes from the lungs and skin. Thus we clearly understand how the enormous quantity of oxygen introduced into the body by respiration, and the carbon of the food consumed, are removed from the body; and also how it is that the food required for maintaining the animal in its normal state is in exact proportion to the oxygen absorbed. A horse consumes daily, in his food, on an average, eighty-nine ounces of carbon; and a cow seventy ounces: the former requires $211\frac{1}{2}$ ounces, the latter $186\frac{1}{2}$ ounces, of oxygen, in order to transform the consumed carbon into carbonic acid. But we find, in addition to the constituents already described, that the vegetable contains a small quantity of fatty matter, as well as earthy and saline ingredients. What purposes are served by these in the animal economy? All animals in a state of health have a layer of fat placed between the skin and muscles, as well as between the muscles themselves, thus giving roundness of form to the limbs, as well as constituting a bed for the muscles, in which they have great freedom of motion. Fat is also deposited in the body of the animal, and more particularly in the omentum and round the kidneys. In the carnivora, or animals which live on flesh, the fat contained in the food is consumed in the lungs, for the purpose of keeping up animal heat; and for this reason we seldom find the body of the carnivorous animal to contain much fat. Darwin, in his *Journal of Researches into the natural history of the countries visited during the voyage of the Beagle*, mentions the fact of the Ganchos, or simple countrymen in the Pampas, South America, living for months together on flesh; but he observed

they ate large quantities of fat. And Dr. Richardson has also remarked of them, "that, when they have fed for a long time solely on lean animal food, the desire for fat becomes so insatiable that they can consume a large quantity of unmixed, and even oily fat, without nausea." This instinctive desire for fat, in man and animals living on flesh, arises from the imperative demands on the body for carbon to keep up animal heat, and which is contained in the fat consumed as food.

In the herbivora animal the case is widely different. In it the supply to the lungs is kept up by the starch, gum, and sugar of the vegetable; while the fat contained in the food is in a great measure laid up as fat in the animal body: hence we find the bodies of the herbivora so much fatter than those of the carnivora. But if the supply of the starch in the food is inadequate to the demands for respiration, then the fat is also consumed in the lungs, as in the carnivorous animal: the gum, starch, and sugar being readily transformed into carbonic acid and watery vapour in the animal system, these are first consumed; and, should this supply be inadequate, then the fat; next the fat of the animal body; and lastly, the tissues themselves are laid under contribution, the animal becoming thin and emaciated, and ultimately dying from starvation.

The formation of fat in the animal has been of late a subject of much controversy between M. Dumas, the celebrated French chemist, and M. Liebig, of Germany. The former contends that the vegetable given as food to the animal contains, ready formed in its structure, all the fat necessary for the supply of the animal, and that, like the gluten for the formation of muscle, the phosphate of lime for the bone, and the starch or gum for animal heat, the fat contained in the vegetable is destined to supply the fat of the animal body.

Liebig, on the contrary, contends that, if the animal be supplied with more of the non-nitrogenous constituents of the food (gum, starch, and sugar), than are necessary to supply the demands for animal heat, they are converted into fat in the animal economy. The theory of M. Dumas is at once simple and beautiful; and, as regards the animal in its primitive state, no doubt can exist as to its correctness. But we must consider the accumulation of fat in the ox or sheep confined in our stalls as arising from an abnormal condition of the body, produced by the circumstances under which the animal is placed, and as such, in addition to the fat ready formed in the vegetable, the animal has the power of secreting an additional portion of fat from the food consumed. The saline and earthy matter also contained in the crops have their uses in the animal body: they supply the

* One ounce of oxygen equals 1416.5 cubic inches.

phosphate of lime for the formation of bones, as well as the saline constituents constantly present in the flesh and blood of animals. How far the ordi-

nary cultivated crops are capable of fulfilling the purposes required of them will be seen on referring to the following table:—

AVERAGE COMPOSITION OF CROPS.

100 parts of—	Water.	Woody Fibre.	Starch, Gum, or Sugar.	Gluten, or Albumen.	Fatty Matter.	Saline Matter.
Wheat contain of.....	16	15	55	10 to 15	2 to 4	2
Barley.....	15	15	60	12	2.5	2
Oats.....	16	20	50	14	5.6	3.5
Beans.....	16	10	40	28	2	3
Peas.....	13	8	50	24	3	2.8
Potatoes.....	75	5	12	2	0.3	1
Turnips.....	85	3	10	1	?	1
Carrots.....	85	3	10	2	.4	1
Meadow hay.....	14	30	40	7	2 to 5	5 to 10
Clover hay.....	14	25	40	9	3	9
Pea straw.....	12	25	45	12	1.8	5
Oat straw.....	12	45	35	1.3	.8	6
Wheat straw.....	14	50	30	1.3	.5	5
Barley straw.....	14	50	30	1.3	.8	5
Buckwheat.....	18	18	45	10	2.6	2.3
Maize.....	13	16	51	10	6.6	2.5
Rice dust.....	14		{ 77 }	2	3.2	2.2
Linseed (good).....	10		{ 27 }	22	36	4
Oil-cake.....	15 to 20	15 to 24	30 to 50	12 to 22	5 to 14	5 to 10

From this table it will be seen that 100 parts of the different crops contain very unlike proportions of dry solid food: thus, in order that the animal obtain the same equivalent of dry food as 100 lbs. of hay would yield, it must consume upwards of 600 lbs. of Swede turnips or carrots, or 300 lbs. of potatoes; but of this dry matter the composition exerts a very material influence over its value as food. We have seen that the gluten, albumen, or casein of the vegetable, is converted into blood and flesh in the animal; hence young animals supplied with food containing much of these muscle-forming principles will grow rapidly, and their muscular frames will be well developed; but, unless liberally supplied with such substances as gum, starch, and fat, by which animal heat is kept up and fat formed, the animals will be muscular, but unfit for the shambles. It is a common practice in some places for butchers to feed their growing pigs on the refuse of the slaughter-house, as the blood and intestines of the slaughtered animals; and in France many hundreds of pigs are fed on horse-flesh; these pigs grow rapidly, and their muscular frames are well-developed, but they do not become fat unless supplied with a liberal portion of non-nitrogenous food, such as potatoes or meal would yield.

As it is only from the nitrogenous constituents that muscle is formed, it has been supposed that the quantities of these substances contained in any given article of food would be a fair estimate of its feeding value; and, under this supposition, M. Boussingault has constructed some tables of the

proportions of nitrogen contained in different vegetable substances. The Rev. W. Rham has also given tables in the Journal of the English Agricultural Society, of the relative value of different kinds of food as arrived at by practice; but all such tables must, to a certain extent, be arbitrary, since the quantity of these substances consumed by the animal must be influenced by circumstances, the animal taking active exercise requiring a much larger quantity to supply the natural waste which would occur under these circumstances than would be needed by the animal at rest.

We have seen also that the starch, gum, and sugar of the vegetable supplies the constituents by which the heat of the animal is maintained; and as this heat never varies during health, whatever variation may occur in the temperature of the atmosphere or apartment in which they are placed, it follows that the lower the temperature the larger will be the quantity of carbon consumed in the animal body; this increased consumption arising from a larger portion of oxygen being introduced into the body during cold weather than when the temperature of the air approaches nearer that of the animal; hence, animals will consume a larger amount of food during the winter months than in the summer season, and those exposed to the chilling blasts of winter more than those fed in sheltered situations, warmth being equivalent to a certain quantity of food. With this fact before us, we cease to be surprised at the enormous quantity of train-oil and fat consumed by the Greenlander, while the inhabitants of the tropics exist on fruits

and light farinaceous diet. In the former, the surrounding atmosphere is constantly robbing the body of its heat; whilst in the latter, the temperature of the air approaches so near to that of the body that a little additional heat is sufficient to maintain the requisite temperature. Exercise also, by increasing the number of inspirations, introduces into the body a larger amount of oxygen than would otherwise be inspired; and as this never leaves the body without undergoing a change, it follows that the greater the number of inspirations taken in a given time, the larger will be the demand for food to supply the consumption in the body. Hence we find that an increase of temperature, with diminished exercise, tends to lessen the quantity of food consumed, and also to increase the weight of the animal. This fact has been clearly proved by the experiment of Mr. Childers* in feeding sheep. In this experiment he selected from his flock forty sheep, and divided them into two lots of twenty in each: one lot was left in the field, which had a dry and sandy soil; the other lot was placed in a shed, on a floor made of pine planks, in order that they might be kept dry, the floor being swept once a day. The experiment commenced on the 1st of January, when the twenty sheep in the field weighed together 184 stones 4 pounds, while the weight of those placed in the shed was 183 stones 3 pounds; each lot had as many turnips as they could eat, which averaged 27 stones per day; each sheep was also allowed in addition half-a-pound of linseed cake and half-a-pint of barley per day with a little hay, and an unlimited supply of salt. For the first three weeks each lot consumed equal portions of food, but in the fourth week the sheep confined in the shed ate a less quantity of turnips by three stones per day than those in the field; and on the 1st of February they had gained in weight 21 stones 11 lbs., while those in the field had only gained 15 stones 14 lbs. By the ninth week of the experiment the sheep in the shed had diminished their consumption of turnips two stones more, and also three pounds of linseed cake per day; and on the 1st of March the shed-fed sheep had gained 10 stones and 10 lbs. more in weight, while the sheep in the field had only gained 8 stones and 8 lbs.; and at the termination of the experiment on April the 1st the shed-fed sheep had gained in the last month 23 stones and 15 lbs., or on the three months 56 stones 6 lbs., while the sheep in the field had only gained 12 stones and 10 lbs. in the month, or in the three months 36 stones and 8 lbs., making a difference in favour of the shed-fed sheep of nearly 20 stones; the sheep in the field consuming the same quantity

of food during the whole time of the experiment. In this experiment we have convincing proof that the quantity of food required by an animal will be less in proportion to the increase of temperature; and that when a liberal diet is allowed, but without shelter, much of the constituents of the food will be consumed to keep up the heat of the animal, which would otherwise be stored up in the body as fat, if no such cause of waste existed: and hence to the influence of cold is to be attributed the difficulty of fattening animals in cold weather, or in cold unsheltered situations.

I may also here mention some experiments made by Mr. Morton, at Earl Ducie's farm at Whitfield, as illustrative of the effects of an increase of temperature and diminished exercise on the feeding of sheep. In the first experiment five sheep were fed in the open air, between the 21st of November and the 1st of December; they consumed 90 lbs. of food per day, the mean temperature of the atmosphere being 44; at the end of this time they weighed 2 lbs. less than they did on the 21st of November. In the second experiment five sheep were placed under a shed, and allowed free motion, the mean temperature being 49; they consumed at first 82 lbs. of food per day, then 70 lbs.: at the end of the experiment they had gained in weight 23 lbs. In the third experiment, five sheep were placed in the same shed, but were not allowed to take exercise: they ate at first 64 lbs. of food a day, then 58 lbs., and increased in weight 30 lbs.

Darkness, in combination with warmth and rest, tends mutually to facilitate the fattening process, by removing those causes of excitement which might otherwise exist, and which would tend to an increased consumption of carbon or fat-forming principle in the lungs. It is well known to the practical farmer, that restless animals consume a larger quantity of food, and fatten much slower, than those of a quiet disposition; and as it is the object of the feeder to produce the largest weight of flesh with the smallest quantity of food, all those collateral circumstances should be attended to which facilitate the attainment of the desired object.

Regularity of feeding is another point which should never be neglected, since the gastric juice is secreted by the glands of the stomach at the accustomed time of feeding, and if there is no food to act upon, it irritates the coats of the stomach itself, producing a restlessness and inquietude which is highly injurious, and tends to check that steady progress of the animal which it is so desirable to maintain. Von Thäer, in his work on agriculture, says that, "in fattening, care should be taken to maintain a uniform, and particularly in winter a somewhat high temperature. Light must be intercepted; for just in proportion as it keeps up the

* Journal of the Royal Agricultural Society.

health of cattle, so does darkness accelerate the attainment of the required degree of fatness. The repose and contentment—the happy freedom from anxiety, arising from the certainty of receiving their food in proper time and measure, contributes so much to the fattening of cattle, that a much more plentiful supply, given irregularly, cannot make up for the want of order. The hour for feeding, and the quantity of food, may be variously regulated, but a system once adopted should be strictly adhered to.”

The saline and earthy matter contained in the food, is by no means an unimportant ingredient. The animal requires that the plant should supply phosphate of lime, for the formation of its bone, and saline matter for the blood: and it is a beautiful provision of nature, that plants will not grow in soils which are devoid of those constituents required by animals: hence the advantages derived from the use of such manures as guano or bones, and the saline manures, or the urine of cattle, in the growing of our commonly cultivated crops.

The proportions in which these different constituents of the food are required by the animal, varies at different periods of its growth, and also at different stages of its approach to that degree of fatness which fits it for the shambles.

In the young and growing animal there will be a larger demand on the food than there would be in after-life. The muscles require to be enlarged by the addition of more gluten or muscle-forming principle than would be sufficient to compensate for the natural waste constantly going on in the body, and the food must supply an increased quantity of phosphates for the growth of bone; the lungs are more active, and the greater number of inspirations are made in a given time, by which more carbon is consumed; hence the necessity of supplying the growing animals with a richer and more nutritious diet than would be required by the adult, and of feeding at shorter intervals.

The milk of the mother is the food prepared by nature for the young animal; and a glance at its composition will be sufficient to convince us how admirably it is adapted to fulfil the purposes required of it in the animal economy:—

COMPOSITION OF MILK.

Butter	27	to	35
Cheese (casein)	45	to	90
Milk-sugar	37	to	50
Phosphate of lime	3	to	10
Salts	7	to	10
Water	831	to	805

The sugar of milk with the butter supplies the materials which are consumed in the lungs of the young animal, by which animal heat is kept up. The casein, or cheesy matter, yields the materials

for the growing muscles, and the gelatine of the bones; while the phosphate of lime, dissolved in the water, supplies the earthy matter for the bones. The quantity of milk, and the proportions of the ingredients contained in it, varies with circumstances, such as the breed of the cow, the food with which she is supplied, the time of the calving, the age, and the state of health. It is also materially influenced by the temperature of the air; warmth producing similar effects on the composition of the milk as on the fattening of the animal; the colder the air the less butter will the animal yield in her milk. This fact is well known to farmers, the cause being the larger consumption in the lungs of the animal to keep up its heat against the cooling influence of the external air, of those principles in the food from which the butter is formed. As an illustration, I may mention an experiment conducted under my own directions. Six cows, during the warmest part of the summer of 1844, when in the field, yielded, on an average, fourteen quarts of milk each; as the season advanced, and the weather became colder, the quantity of milk steadily diminished, and with it the butter. In the early part of November, four of the six cows were placed in a house, the floor of which was boarded in order to keep them dry. Light was nearly excluded, and the mean temperature of the house was kept at about fifty-five, the animals having barely enough room to lie down in their stalls; their diet was cut turnips, hay, chaff, and a little ground lentil mixed with the chaff. For the first few days the animals were evidently uncomfortable in their new habitation, and their yield of milk diminished. At the expiration of three weeks the milk had again increased, and the quantity given was equal to that of the best yield of the summer. By the middle of December—the cold being then intense in the open air—the cows gave eighteen quarts each of rich milk, from which a proportionate quantity of butter was made. Animals when yielding milk require a richer food than when dry, since it is from the food taken that they are enabled to secrete their milk; and if their food does not contain a sufficiency of the elements required, the milk is less nutritious, hence the growth of the young and sucking animal is less rapid, and its future health and strength of constitution suffers by the treatment it receives when young. When sheep are fed on turnips, and in winter, during the time they are giving suck, it is a good plan to allow a portion of oilcake, or linseed, or pea or bean meal, as part of their daily food; such addition greatly improves the secretion of milk, the lambs grow rapidly and fatten much earlier than when no such addition is made, and the sheep are found to be in much better condition in the spring. In

the rearing calves, also, it is desirable that they should have the whole milk, and not be supplied after the first two or three days with milk which has been skimmed, as is the custom in some parts of England. The practice of the late Earl Spencer in feeding calves was to allow them the unskimmed milk for the first three months, and afterwards to give them skimmed milk mixed with barley or oatmeal; this practice was found to succeed remarkably well; but I am inclined to believe that pea or bean meal mixed with linseed would probably have been better than oat or barley meal, since the bean and pea contain vegetable casein, which is identical in composition with the casein of milk, and forms an admirable substitute for it; while the soluble gum and mucilage of the linseed would be more easily acted on by the stomach of the young animal than the insoluble starch of the oat or barley.

In fattening calves for veal, attention should be devoted to the production of fat animals of moderate size, veal of this description being most sought after by the epicure. The animals should be kept perfectly quiet, and placed in as warm a situation as convenient, that there may be as little loss of the fat-forming principle as possible; and a gloomy situation, not amounting to actual darkness, is found by experience greatly to assist the above means, by inducing tranquillity and a disposition to sleep. The food should be rich and regularly supplied, and the strictest attention to cleanliness

should be observed. Bleeding is occasionally had recourse to by some feeders, and its effect is to check the too rapid development of muscle, while it does not interfere with the regular accumulation of fat in the body. Animals intended for stock should be allowed exercise, that their muscular frames may be well developed; and their food should be of a nutritious character, containing sufficient gluten to supply the full demand of their growth. They should have sheds to go into at night and during rain, with a dry bed to lie upon; animals so treated will grow rapidly, fatten much faster when required, and be of a stronger constitution than those fed on course, inferior, and unwholesome food, which is unfit to supply the demands of the system, producing an imperfect development of the animal frame, and not unfrequently engendering disease of a troublesome and often fatal character.

I have now laid before you a sketch of the theories of our best animal physiologists, and applied them to the rearing and feeding of cattle; had time permitted I would have entered more into detail. If I have succeeded, by the practical experiments I have deduced, in convincing you of the correctness of these theories, you are in a position to examine them for yourselves, and to regulate the management of your live stock as may be best suited for the purpose they are intended to serve.

Mr. Gyde concluded his lecture amidst loud and general cheering.

A VISIT TO THE FARMS OF THE REV. A. HUXTABLE,

AT SUTTON WALDRON.

Public attention having been much excited during the last few months by the frequent mention at agricultural dinners of the name of the Rev. A. Huxtable, and the advice to visit his farms at Sutton having been again and again reiterated by gentlemen who had seen them, we considered that a familiar description of those farms, together with an account of the new modes and systems adopted by Mr. Huxtable, would be very acceptable to our readers, and accordingly the rev. gentleman having given a very kind and ready invitation, in reply to an intimation of our wishes, we proceeded on the 5th instant to fulfil the visit of which we now proceed to give an account.

The rev. gentleman occupies two farms—the Hill Farm and the Vale Farm; the former being upon chalk, the latter on clay, and lying at a distance of three miles from each other. The Hill Farm, of 135 acres, was taken about two years

since, when to the larger portion (about sixty acres being fair average down land) might well be applied the forcible language of the Hon. and Rev. S. G. Osborne—"The rabbits had the fee simple, and with all their subsoiling and top dressing could not make it productive." In fact, it was then a portion of the most barren land in Cranborne Chase. It principally consisted of down of the poorest character, encumbered with stunted coppice wood, furze, and brambles, a portion of which is still left as a sample; and, in addition, was situated on such steep acclivities that it appeared well worth the whole price of the crops that could be grown there to plant and gather them. Certainly, if anything can heighten the pleasing reflections with which Mr. Huxtable must regard the results of his labours, it is the sight of the land which he has cultivated, but which in the onset would have frightened many less enterprising farmers than

himself. The soil was so scanty that here and there the substratum of chalk peeped through the greensward like the limbs of a beggar through his ragged garments, and where there was soil it was not more than $2\frac{1}{2}$ inches thick. Mr. Huxtable's first step was to grub up the roots and burn the surface, and then sow the coppice land half with peas and half with rape. The peas were carted away, and the rape fed off by sheep; but it is rather remarkable, that by the application of about two hundred weight of guano to the land on which peas had been grown, it was rendered more productive for wheat than the land fed off by the sheep—a fact which may surprise those of our readers who pin their faith to the virtues of fold manure. The land was then set to wheat, and produced a fair average; of the remainder about fifty acres were sown to Swedes.

On part of this farm are five acres of extremely barren land, called by Mr. Huxtable "his experimental hill." On this land were grown the swede turnips of which an account was given at the Sturminster and Blandford dinner. We walked over it, and were as much surprised at the enormous dimensions of the turnips as at the stony, barren-looking soil on which they grew. From this land 21 tons of Swedes per acre have been obtained, and in proof of Mr. Huxtable's assertion that he could grow a crop in a hole cut in a table, we may mention that we saw some of his finest turnips growing in a hedge furrow, from whence the little quantity of soil originally found had been thrown to form a bank. Thus on flints and chalk (for those were all that could be observed) were grown a sample of turnips that might challenge the produce of the richest lands in the county. These turnips are the staple food used for the stock on the farm, and which, as they are treated in a somewhat different manner than usual, deserve a special notice.

The sheep and oxen are fattened in sheds thickly thatched, the wind-ward side being stopped up with turf and the other penned with hurdles, through which sufficient air penetrates. The sheep sheds are very simple erections, put together by the labourers on the farm. The following description of them was given by the rev. gentleman himself, in a letter to J. W. Childers, Esq., M.P., contained in the *Journal of the Royal Agricultural Society*, vol. vi, part 1:—

"A couple of fir poles, 12 feet long, are nailed together at the top; their extremities, at a distance of 15 feet, are driven into the ground; another couple, 10 feet distant, are united with this, and held firm by a ridge-pole nailed into and lying between the tops of the fir poles, Side pieces are

nailed parallel to the ridge-pole, and small hazel-wood is interlaced, so as to support the thatch, which a labourer ties on with tar-twine. The thatch in front and behind reaches to about 3 feet from the ground; behind, a bank of turf is raised to meet the thatch; the front is guarded by a hurdle, moveable at pleasure, to allow the sheep to go into the court, which is of the same size as the shed. It is important that both ends of the shed should be protected with bavins only, which will secure a free ventilation, yet keep out rain. My sheds, about 50 feet long (not charging the straw), cost about 41s. each. These sheds are covered with 1-inch boards, separated (each strip from the other) by $\frac{3}{4}$ inch intervals. The cost of the timber and mode of preparing the floor were as follows:—White pine timber was used for its cheapness, being 1s. 3d. the cube foot, which would therefore give eleven 1-inch boards. On account of the particular width of the logs which I bought, the board was sawn into pieces 7 inches broad and 1 inch thick. These, for economy, are hand-sawn into three parts, and are nailed upon joists at a distance of $\frac{3}{4}$ inch. By this plan nearly one-third of timber is saved; so that each sheep, requiring 9 feet of space, lies actually on 6 feet of 1-inch board. The cost of timber for joists, nails, and carpenters' work, raises the total expense of placing the sheep on boards to 1s. 4d. per head."

We may remark that these sheds have since been considerably improved by the addition of a gangway in the middle, along which a man passes to feed the sheep without (as before) being obliged to get into their pens and disturb them.

The animals stand entirely on rafters placed about an inch apart, and thus allowing an aperture through which the dung and urine pass. Under these rafters is a small pit containing saw-dust or burnt earth, burnt clay, ashes, or any other porous material which absorbs the salts of the manure. These pits are calculated to hold as much manure as will accumulate in three months—the time given for fattening—when the sheep are sold off and the pits emptied.

The beasts stand only partly on these rafters, their fore feet resting upon sand or sawdust (in the absence of sawdust Mr. Huxtable recommends chopped straw). As these animals are, unlike the sheep, fastened to their mangers, it is not necessary that their floors should be entirely of wood. The sheep are kept in pens, and in one shed, 70 feet long and 15 wide; we noticed six score, all looking fat, healthy, and remarkably clean. The superiority of this plan of keeping stock consists, first, in the cleanliness of the animal; and, secondly, in the preservation of the manure without the slightest

waste of any of those essentials, whether solid or liquid, which escape in the usual method of fattening stock.

The manure, after removal, is taken to caves scooped out of the chalk, being about 50 feet long, 9 wide, and 9 deep, and thatched over; here it is mixed with dry clay or ashes, and left until required to drill with green crops, or to sow broadcast with corn.

The various liquid matters that accumulate on a farm (excepting those that have been already mentioned) are conveyed to a large tank under ground, from whence they are pumped up when required.

Our readers may recollect a reference made at Sturminster to the value of dead horses, reduced with sulphuric acid as manure. We were not fortunate enough to visit the farms at a time when this process was going on, but we witnessed something that will astonish the incredulous still more, viz., the dissolving of *rats* for the same purpose. All the vermin caught on the farm are thrown into sulphuric acid, by which they are soon converted into a manure as valuable as bone dust. Thus, on an improved system of farming, the very pests and scourges of the farmer may be converted to his advantage.

The principal food of the beasts, as we have mentioned, is sliced Swedes; but bruised linseed steeped for twenty-four hours in cold water, then boiled and poured over chopped straw, with barley or pea meal, is daily given to them.

The mows and ricks in the yard are raised above the ground by brick pillars, and the earth being dug out between, space is thus afforded for waggons, carts, dry manure, &c. Under one of these mows, of not unusual dimensions, we saw two waggons and a cart, and under another a large quantity of ashes. Besides economising the ground of a homestead by this contrivance, the cost of a wagon-house is altogether avoided, whilst the contents of the rick are preserved from the ravages of vermin.

The barn-doors, instead of turning upon hinges, are drawn back upon iron slides, by which arrangement the effect of the wind (which is here sometimes very high) is greatly checked.

The Vale Farm, of 95 acres, of which four acres are coppice, was a poor dairy farm when taken by Mr. Huxtable. Here are a number of cattle sheds, similar to those at the Hill Farm, and several pig houses, wherein these animals run about on sawdust, which plan renders the contrivances in the sheep and beast floors unnecessary. There is also, as at the other farm, a steaming apparatus, having attached two coppers, into each of which are fitted another copper. The steam is circulated round the

inner copper, raising the water in it to a boiling heat; and, by a simple contrivance, the steam can be immediately drawn off from one to the other of these coppers; so that as soon as linseed has been boiled in one, the steaming of potatoes, or any other article, can be immediately commenced in the other. In these utensils linseed, potatoes, and chopped Swedes are prepared.

In 1844 Mr. Huxtable detailed at Sturminster the results of experiments in pickling carrots and mangold wurzel. The carrot-top experiment has answered perfectly, but subsequent trials have proved the failure of the mangold wurzel. Mr. H.'s opinion is, that in air and water tight-caves the system would answer perfectly; but he considers that the most economical use of these tops is their consumption whilst green by milch cows and breeding ewes, to both of which the large quantity of phosphates the tops contain is eminently serviceable.

By the horse power which drives the thrashing-machine, a band attached to a drum cylinder is set in motion, and by this no less than three other machines are worked, viz., a chaff-cutter, a bean-crusher, and a linseed-crusher (on Earl Ducie's principle). These drop their produce through pockets into proper receptacles in the floor below.

This farm, when taken by Mr. Huxtable was, with the exception of 10 arable acres and a 5 acre coppice, wholly pasture—undrained—and let at only 80*l.* per year. It has been thoroughly drained by tile drains put in three feet deep, and placed a perch and a half apart down the furrows, on Mr. Smith's, of Deanston, plan. By the aid of this and the home-manufactured manures, an average crop of Swedes has been grown, even after two crops of clover had been fed off the same year.

The present stock maintained on the 230 acres of land consist of 31 fattening beasts, 400 fattening sheep, 240 breeding ewes, and 50 pigs. These are the numbers of stock at present kept on the farms, but Mr. H. calculates that the supply of roots now existing would carry nearly double the quantity which are to be provided as soon as the necessary buildings are completed. As a proof that their novel mode of feeding do not deteriorate their quality, it may be mentioned that a pen of ten wethers purchased at Wilton fair at 36*s.* a head, and kept in sheds for eleven weeks, were sold to the butcher on the day of our visit at 56*s.*

It would be an act of ingratitude to omit to acknowledge the kind and hospitable reception we received—the perfect openness with which everything was shown, and the readiness and courtesy with which the required information was given.—*Sherborne Journal.*

NORTON FARMERS' CLUB.

On Monday evening, the Norton Farmers' Club held their annual meeting at the Bagshawe Arms. Owing to the regretted absence, from indisposition, of W. J. Bagshawe, Esq., the President of the club, Mr. James Jenkin presided on this occasion. After an examination of the yearly accounts, which showed that the affairs of the club were in a flourishing state, Mr. Richard Booker, jun., was called upon to read his promised paper on "Tenant right and security of tenure."

Mr. BOOKER commenced by recapitulating the substance of his former remarks, which we noticed at the time in the "Independent," and requested the secretary to read extracts from the speech of Mr. Shaw, of the Strand, London, treating on the subject, as reported in the "Farmer's Magazine" for January; but, owing to the great pressure of matter, we have only room for the following:—

"The question of 'tenant right' divides itself into two heads. First, 'as regards outlay in the improvement of the soil, whether permanent or otherwise;' and secondly, 'as regards outlay in the improvement of buildings.' The first of these heads, 'improvement of the soil,' may be again subdivided into two parts. First, permanent improvements, or such as will endure through a long period; as enclosing and breaking up waste land, uprooting trees and hedge-rows, and levelling banks when the enclosures are small, draining, making roads, &c. Secondly, improvement of the soil by extra tilling, subsoiling, and the application of an additional quantity of manure. Now, as regards the first class of improvements, it is manifest that a considerable period of time is requisite to enable the tenant to recover back so large an outlay. I am anxious to establish the right of the tenant to compensation under any tenure, the duration of which has not been originally agreed upon, and hence any reference to leases will only be made for the purpose of exemplifying the subject. A lease for this purpose may be considered as a mode of payment by the landlord to the tenant for improvements, by securing to him the enjoyment of his outlay during a sufficient period to enable him to reimburse himself. Upon some estates, the best and most equitably regulated (as, for instance, those of the Earl of Yarborough, in Lincolnshire), no leases are granted, but agreement is entered into between the landlord and the tenant, whereby, in the event of an unwilling removal of the tenant, compensation for permanent improvement is made.

But to carry out my views to the full extent, the tenant should obtain compensation for actual improvements, under whatever circumstances he might quit his occupation. Leases and agreements, such as I have just alluded to, cannot be otherwise regarded than as affirming the principle of 'tenant right;' for if it be just that the tenant should have *time* to reimburse his outlay, he has an equal claim in the event of his being deprived of his occupancy by unforeseen circumstances, and which of course is more liable to occur where he has no fixed tenure. The landlord, who should expect the manufacturer or the commercial man to make an outlay in the permanent improvement of his premises, without such an agreement as would secure him compensation, should he be ousted before he was enabled to obtain a return, would be regarded as little less than a madman. The practice of other classes, therefore, warrants the compensation contended for. In respect to compensation for this class of improvements, a considerable advance has been made; and there can be no doubt but that, as the owner of the soil shall become better advised of the advantages to himself from adopting such a system, the progress will be more rapid. As regards the second part of this head, namely, improvement of the soil by extraordinary cultivation and the application of extra manure, it is but common justice and common honesty that the tenant who expends his capital should either have the opportunity of reaping the advantage, by taking a sufficient number of crops, or receive compensation for that which he leaves in the soil for the benefit of the landlord. I say for the benefit of the landlord—because, if the farm falls into his hands, it will let for more money. In taking this view, I do not seek to obtain any peculiar advantage for the tenant, but merely to obtain for him a return for skill and capital invested, and for which, I think, it will not be denied he has a just claim. As regards the second head—the improvement of buildings—the propriety of making compensation for this species of outlay by the tenant cannot be doubted. Upon the suitability and convenience of farm buildings, in a very considerable degree, depends the advantage of the tenant from his occupation; and yet in what a lamentably deficient state, both as regards structure and extent, will most farmsteads be found! A dogged adherence to old maxims of law, in every point having regard to the management of their estates, whether in reference to the rules of cultiva-

tion, or the economy of the buildings, has especially signalled the lords of the soil. Privileges have been conceded to occupiers engaged in trade, by which they are permitted to remove buildings erected for the express purposes of trade, whilst the landlords, themselves the legislators, have not sought a similar privilege for their tenantry; nay, with more of law than justice, have frequently insisted upon buildings erected at the cost of the tenant being left for their use and benefit, without the slightest compensation. Surely in farming, as in trade, if the tenant chooses to incur the expense of erecting buildings for his own accommodation, when the landlord is unwilling to lay out his money, he should at least be permitted to remove such buildings on his quitting the farm. As regards compulsory compensation for buildings erected by the tenant, I am aware that considerable difficulty must occur, inasmuch as without a perfect understanding between landlord and tenant, the landlord might be involved in heavy, inconvenient, and not unfrequently unnecessary expense; this remark, however, would not apply if the power of removal were granted to the tenant. It will be readily admitted that but a small proportion of the land of this kingdom is let under lease, or under agreement, giving compensation to the tenant in the event of unexpected removal. Now, I am willing to give credit, to the fullest extent, to those noblemen and gentlemen, owners of estates, who, not giving any fixed tenure to their tenants, may be implicitly relied upon as never turning out or taking undue advantage of a well conducted tenant; but then it must be borne in mind, that honour, any more than talent, is not hereditary, and hence the estate of the most noble-minded, honourable landlord may be destined to undergo great changes when least expected. I do not believe that, including leases and agreements giving compensation, one-third of the tenantry enjoy this protection in the investment of their capital. What man of common prudence will, in such a state of things, embark his capital in the improvement of the soil? On the other hand, how liberally and how spiritedly would extra cultivation be carried on, and extra manure applied, if the tenant felt safe in obtaining compensation provided he were suddenly and unexpectedly deprived of his farm! If the position of the landlord be referred to, it will be found that he will be no less benefited by the establishment of a 'tenant-right.' The confidence inspired in the tenant, from the knowledge that his capital is safe, will stimulate him to improve the soil, and of this improvement the landlord must sooner or later obtain a proportionate part. As the old system of farming is passing away, so must old customs, antiquated modes of tenure, and 'clogging' covenants. 'High,' or

what may be termed a more 'artificial' mode of farming, must be pursued by the tenantry, and the landlords must keep pace with the tenants. They ought, indeed, to take the lead, and I am convinced that they could not do so more beneficially to their own interest, than by establishing a 'tenant-right.' The cultivation of the soil cannot henceforth be carried on to advantage without ample capital; tenants with ample capital are becoming too much men of business to invest their capital unless they see it secured. Landlords will find it to their advantage to have tenants possessing capital; and hence I doubt not the time is at hand when a knowledge of their own interest will induce them to concede the establishment of what I contend for, a 'tenant-right.'

Mr. BOOKER said, he could not urge anything more applicable to the question, and in support of his opinion, than the foregoing; and he should conclude by proposing the following resolution, viz. :—"That it is the opinion of the Norton Farmers' Club, that the views on the important question of 'tenant right,' so ably discussed by the distinguished friends of agriculture in London, on the 10th Dec., are worthy of the best attention of their body, and the united support of the agriculturists in the United Kingdom."

Mr. JOHN HEWITT, of Bradway, seconded the resolution. After pointing out the inadequate protection of the capital invested by tenant farmers, and the unremunerative profits derived therefrom, Mr. Hewitt proceeded to say that it would be no easy task to find a trade or profession among the whole range of manufactures or commerce, that suffered so extensively as farming. If a commercial man sees an opportunity of extending his business, his landlord assists him in carrying out his plans, knowing full well that it is his interest to enable his tenant to carry out his views, either by effecting the improvements himself, or advancing capital at a fair rate of interest, and guaranteeing a security of tenure. With the tenant farmer the case is very different, landlords generally being very backward in making improvements. He admitted that there were some noble exceptions; but generally speaking, landlords are far from being liberal in these things. It is often said, if the landlord is unwilling to expend his capital in making improvements for his tenants, the latter may make them himself, which he is frequently urged by his landlord to do. When the tenant complains of bad times, the low price his produce brings in the market, and the consequent difficulty he finds in meeting his payments, "Oh," says the landlord "you are negligent; you must bestir yourself, be up and doing, and move with the times, and make two blades of grass grow where only one grows now." This is all very fine,

and would be all very well, if the tenant were protected for his outlay. But who, I will ask, would risk his capital in the dark, as he certainly must do under the present system of yearly tenure? Some tenants, I admit, have done so with success, but numbers have been ruined by it. Suppose, for instance, a tenant with adequate capital at his command, takes to a farm much out of condition, and having confidence in the landlord, enters as a tenant at will. He sets about draining, subsoiling, straightening old fences, breaking up old pastures which grow nothing but rushes, brambles, and anything but what they ought to do, and in a few years makes the land grow twice the produce it was growing when he took to it. Just at the very time when he is beginning to reap some benefit from his improvements, his landlord dies, or the farm is sold. The new landlord or his agent probably values the land at what it is now worth—not what it was—consequently the tenant, who had perhaps expended all his capital in making the farm productive, must either quit, or pay for his own improvements. He (Mr. Hewitt) asserted that this was no overstrained case. There had been numbers of such instances, and he would refer to two among the number which had come under his own observation. Both the farms, he believed, are now held by members of this club. One was taken to a few years since by a gentleman of capital; a large portion of the land was in a very inferior state of cultivation. He began by draining, liming, fixing manure tanks, and applying large quantities of farm-yard and artificial manures; and what is the result? Why, just before last harvest, he (Mr. Hewitt) chanced to go over part of this farm, which, when the present occupier entered to it, scarcely grew produce enough to pay rates and taxes, but he then saw as fine crops of grass and corn growing as he could wish to see. And now that the farm is beginning to repay the tenant for his outlay of capital and industry, the property has changed hands, and the rent has been considerably advanced (*hear, hear*). The consequence is, that the tenant will not consent to hold under such a landlord, and he is about to quit. Being under a better “custom,” than most of the farms in the neighbourhood are held, the tenant will receive some sort of valuation; but his sacrifice of capital will undoubtedly be large. Had he unfortunately held under the prevailing “custom,” he would not have received a single shilling for tillages and many other valuable improvements. The other farm he had referred to was at some distance from there. When the present tenant took to it, the land was in a cold, wet, and uncultivated state, and grew a very inferior herbage and he entered to it at its then value. The farm has subsequently been thoroughly drained and manured, and brought into a fair state of cultivation.

No sooner, however, had this been done, than the landlord sent a valuer over it, who doomed the tenant to pay ten shillings an acre more rent (*shame*). The tenant having no other alternative but to quit or pay is still occupying the farm, and paying ten shillings extra per acre for his own improvements. Now, (said Mr. Hewitt) if this be right, he could not well conceive what is wrong; and yet it is according to law. To him (Mr. Hewitt) it was a matter of astonishment that tenant farmers should have so long and patiently submitted to such a state of things (*hear, hear*). He felt confident no other class of persons would have done so. Had the commercial interest been no better protected, the tables of both Houses of the Legislature would have been covered with petitions praying for a redress of grievances. It was his belief that if Parliament can be prevailed on to enact a law by which the tenant farmer will be enabled to recover for all acknowledged and permanent improvements, good farming will become general, and improvements carried out on an extensive scale. And if ever there was a time when the British farmer might with propriety go to Parliament and ask for such a law, it was now, since it was quite evident from what they had recently seen, that the farmer will ere long have to compete with foreigners, whose rates and taxes, to say nothing of rents, are not one third of his. The only advantage the British will have over the American farmer, and others in the north of Europe, will be in the cost of conveying produce to market; and the cost of transit is no small item in the expenses incurred in some parts of England. Such a law as he had spoken of would be beneficial to all classes. It would first benefit the labourer, in finding him more employment, and consequently better wages. It would next benefit the tenant, in yielding a double amount of produce, owing to improvements; and it would benefit the landlord, too, because it would improve the value of his property. And lastly, it would benefit the community at large, because the more the land produces, the better would the markets be supplied, at a more reasonable rate. He (Mr. Hewitt) was sanguine enough to believe, that if the system he and Mr. Booker advocated had been in existence ten years since, the population of this country would not at that time have been dependant on foreigners, for a supply of the first necessary of life, for it is asserted by many who are well acquainted with the subject, that the land now in cultivation in the United Kingdom (to say nothing of that which might be brought into cultivation), is capable of sustaining a population much larger than the present, without any foreign aid, if the land were properly cultivated. There is plenty of capital and skill in the country, and a willingness to invest and employ it, if the enterprising tenant is guaranteed a security of tenant right (*hear, hear*). Let this be

done, and we shall soon see capital and skill employed in making improvements in the soil, and the market largely and better supplied with English produce. Recompence for improvements would, Mr. Hewitt thought, supersede the necessity of leases, since there were more objections to the latter than the former. He was glad the subject had been taken up in so spirited a manner by the Farmers' Club, in London, and he trusted the excellent sentiments of Mr. Shaw and others would be responded to by the Norton and other farmers' clubs throughout the country, for the farmers may rest assured that nothing will tend so much to consummate the rightful claim they have in view, as perseverance and unity of purpose. Mr. Hewitt concluded by seconding the resolution, amid manifestations of approval by the members present.

Mr. Jenkins (Chairman), Mr. Green, and others, heartily concurred in what they had heard, and the resolution was put to the vote, and carried unanimously. The Secretary was also requested to forward a copy of the resolution to the Farmers' Club in London.

This being the time for the election of officers, Mr. Rogers, was re-elected secretary, and Mr. Booker librarian and treasurer, for the ensuing year. The remainder of the evening was occupied with matters of general interest to farmers; and among other things, it was stated that the failure in the potato crop in this neighbourhood was reckoned at from

one-third to one-half. Mr. Nelson, veterinary surgeon, related two more facts which ought to operate as a further caution against individuals throwing or leaving dangerous articles in the way of cattle. In one instance where he had been called in, he found a valuable beast labouring under an affection of the heart, and the cause and remedy being obviously beyond veterinary skill, he ordered the beast to be slaughtered, when a large crooked needle was discovered in the pericardium of the heart. Six quarts of fluid were also found in the vacuum or bladder adjoining, whereas a table-spoonful was the usual quantity found in a healthy beast. The presence of the fluid was attributed to the injury caused by the needle. On enquiry, it was learnt that the cow-house adjoined a needle manufactory, and that a number of waste needles having been carelessly thrown into the yard where the cows were kept, it was reasonably conjectured that the needle had been licked up with turnips or some other food of the animal. The death of the other cow was caused by a similar article being found in its heart, supposed to have originated in a similar manner to the above.

The next meeting of the club was announced to take place on the 9th February, when Mr. Nelson will read a paper on "Broken Wind in Horses." It is understood, that at the meeting following a paper will be given on "Turnip Sowing."—Sheffield Independent.

NEWCASTLE FARMERS' CLUB.

On Saturday last, a public meeting was held in the Lecture Room of the Literary and Philosophical Society of this town, for the purpose of forming a Farmers' Club, the object of which is to gain and diffuse information on the subject of agriculture, G. H. Ramsay, Esq., of Derwent Haugh, in the chair.

The CHAIRMAN, in opening the business of the meeting, observed, that they were met for the purpose of laying the foundation stone of the Newcastle-on-Tyne Farmers' Club. The advertisement calling the meeting they had all no doubt read; and it needed little argument to prove the importance of such a society as the one now proposed to be formed. The gentlemen who had originated this society had considered, that by bringing the farmers together and associating them with men of business in this town, they would do a service to the cause of agriculture in the north of England. The district surrounding Newcastle contained many intelligent agriculturists and gentlemen connected with

agriculture, and interchanging their ideas in the discussion of various subjects, they would be enabled to elucidate every subject connected with agriculture. No doubt the interest of the landlord was concerned in the improvement of agriculture, and the interest of the farmer was vitally so. Farmers in the north believed they had made rapid progress in agriculture. He was, however, well convinced that a great deal had yet to be done in this neighbourhood, and in the kingdom generally. There were now in this country upwards of seven hundred associations of one description and another, many of them farmers' clubs. A club was now held in London, and he saw nothing to prevent a large party being gathered in the town of Newcastle. They had a ready market in this town for their produce. That produce was all swallowed up in the town; the farmers had nothing to export; indeed Newcastle was an importing town. He was not against this; because he knew there were some other parts of the country which required outlets

for their produce. This showed that the farmers in the neighbourhood had great inducements to increase the amount of their produce, for they had the ready means of disposing of it. He hoped the rules which the committee had to lay before the meeting would meet with their approval. With respect to the rule which referred to the establishment of a library for the use of farmers, he would remark that at first this library would be a small one; but as the members of the society increased in number he hoped the number of books would increase also. It was quite clear that the knowledge to be derived from books ought not to be neglected by the farmer; for agriculture had derived the most important service from the application of art and science by men of talent who had published the results of their experiments. The quantity of land under cultivation in this country was perhaps more than most people were aware of—it was no less than fifty millions of acres. When they considered the immense capital employed in carrying on the cultivation of this immense tract of country; and the immense number of persons employed in that cultivation, they could scarcely for one moment hesitate in carrying out the design of this society to assist them in their own local district (*ap- plause*). The rules provided that a discussion should take place at their monthly meetings; he hoped that at these discussions a great deal of knowledge would be brought before the public, and that this society, would become popular. They were joined by many gentlemen of influence in the neighbourhood. The subscription was a small one, and it was made so in order that the door of knowledge might be opened to every poor farmer in the neighbourhood; and he had no doubt they would all be quite hearty in the cause (*cheers*). He now begged the secretary to read the rules which had been drawn up by the committee.

Mr. GLOVER, the secretary, then read the rules of the proposed club, the substance of which was that a meeting of the members be held on the first Saturday in each month for receiving papers and discussing agricultural subjects; that a library be formed consisting of works on botany, geology, and chemistry; that a museum be opened for the exhibition of improved specimens of grain, agricultural implements, &c.; that the society consist of ordinary members subscribing 10s. 6d. annually, a president, four vice-presidents, a secretary who shall act as treasurer, and a committee of twelve members.

After some discussion the rules were adopted.

The SECRETARY then stated that he had applied for the use of a vacant room in the Literary and Philosophical Society's buildings, and he expected to obtain one on reasonable terms. He also stated

that he had received letters from parties offering to send specimens of grain and plants: a letter from Mr. Shaw editor of the *Mark Lane Express*, promising the club a copy of the Translation of Von Thäer's Work on Agriculture; and letters from the editor of the *Agricultural Gazette* and the *Gardener's Chronicle*, promising assistance.

Sir M. W. RIDLEY moved a vote of thanks to Mr. Shaw, and the editor of the *Agricultural Gazette*, which was carried unanimously.

The following officers were then appointed, viz: President, Sir M. W. Ridley, Bart.; Vice-Presidents, Wm. Ord, Esq., M.P., Savile H. Ogle, Esq., M.P., G. H. Ramsay, Esq., and Wm. Anderson, Esq.; Secretary and Treasurer, Mr. Wm. Glover; Committee, Mr. Nicholas Burnett, Mr. George Bates, Mr. Wm. R. Swan, Mr. John Robson, Mr. John Redhead, Mr. Wm. Sheraton, Mr. John Milburn, Mr. Wm. Stephenson, Mr. Wm. Nixon, Mr. John Brown, Mr. James Colbeck, and Mr. Ralph Atkinson.

Sir M. W. RIDLEY expressed his approbation of the club now formed, and of his intention to give a frequent attendance to its meetings.

Thanks were then voted to the chairman, and the meeting broke up.

TITHE COMMUTATION.

SIR,—As your clerical as well as agricultural readers may feel anxious to know the result of the averages for the seven years to Christmas last, which have been published in the *London Gazette* of this evening, viz:—

	s. d.	
Wheat.....	7 4	per imperial bushel.
Barley.....	4 1½	„
Oats	2 9	„

I beg to state that each 100l. of rent-charge will, for the year 1846, amount to 102l. 17s. 8¼d., or about one per cent. less than last year.

The following statement from my annual tithe commutation tables will show the averages from year to year since the passing of the Tithe Commutation Act:—

AVERAGE PRICES FOR SEVEN YEARS.

	Wheat,		Barley,		Oat's,		Value of Tithe	
	per imp. bushel.	s. d.	per imp. bushel.	s. d.	per imp. bushel.	s. d.	£ s. d.	
To Christmas, 1835	7 0½	3 11½	2 9	100	0	0		
— 1836	6 5½	3 11½	2 9	98	13	0¾		
— 1837	6 6½	3 11½	2 8¾	97	7	11		
— 1838	6 6½	3 9¾	2 8	95	7	9		
— 1839	6 0	3 11½	2 9½	98	15	9½		
— 1840	6 11½	4 1	2 10¾	102	12	5½		
— 1841	7 3¾	4 2	2 11½	105	8	2¾		
— 1842	7 7½	4 1½	2 10¾	103	12	2½		
— 1843	7 7½	4 0½	2 9¾	104	3	5½		
— 1844	7 7	4 1½	2 9	103	17	11¾		
— 1845	7 4	4 1½	2 9	102	17	8¼		

I am, Sir, your obedient servant,

CHARLES M. WILLICH.

25, Suffolk-street, Pall Mall, Jan. 2.

AGRICULTURAL EXPERIMENTS.

"SIR,—During the last twelve months I have been examining the heat of the earth a few inches below the surface, for the purpose of ascertaining how far cultivation influences its temperature. Whilst carrying on my experiments, certain results have arisen, which I think may be in some degree interesting to my brother agriculturists. My first trial gave the following results :—

"Nov. 14, 1844.—Weather cloudy; wind w.s.w.; time of day, from twelve to one o'clock.

Thermometer in the air, shaded	52 deg. Fahr.
Thermometer four inches deep in stale ploughed land.....	48½ "
Thermometer four inches deep in land ploughed the day before, and had rain all night	49 "
Thermometer four inches deep in fresh ploughed and harrowed land	49 "

"From these facts it appears that cultivation caused the temperature to rise half a degree. Of the many subsequent observations I have made, I found the results the same, but only to the extent of one degree and a half.

"I consider it useless to trouble you with the dry detail of my several experiments; I shall therefore proceed to say that the very great benefit which arises from cultivation is to be looked for elsewhere. Indeed, I believe it is now generally admitted that the mechanical process of moving the earth, or its cultivation, occasions the exposure to the sun and winds of the particles composing the soil, and thus acts most favourably towards the disengaging of all stale air, stale moisture, and stale gases contained within the same, and no longer congenial for the purposes of vegetation; also, it destroys the old water-ways, through which a large portion of every shower of rain escapes when land has been left long unmoved.

"This is the first advantage arising from cultivation. The next is, by the great exposure of the particles composing the soil to the sun and winds, fresh air, fresh moisture, and fresh gases are thus enabled to enter into mechanical and chemical union with the soil, to be a ready store of healthy nourishment for the support of the ensuing crops. In a few words, cultivation prepares the soil for receiving and digesting food necessary for the support of plants, as exercise prepares the stomach of animals for receiving and digesting food necessary for the support of the body; wanting only, in both cases, a sufficiency of heat and moisture for perfecting the respective secretions.

"I have before shown you that cultivation raises the temperature of the soil. I will presently prove the temperature is also raised by a shower of rain.

"On June 3, 1845.—Weather fine; wind south; time, from two to half-past two :—

Thermometer in the sod was	72 deg. F.
Thermometer 10 in. deep in a few weeks' stale ploughed fallow, which had much rain upon it two days previous	65 "
Thermometer 10 in. deep in fresh ploughed fallow close by	60 "

"In this instance there is a difference of five degrees, and in favour of the stale ploughed land. The cause of this proceeds from the rain entering into combination with the dry soil beneath, and, like water thrown upon fresh-burnt lime, heat was evolved. On the contrary, the fresh moved land, having already combined with the rain-water, was placed by the exposure to sun and air in the best state for evaporation, and cold followed as a natural consequence.

"A valuable hint or two suggest themselves from this—namely, that evil rather than good proceeds from moving land immediately after a shower of rain, particularly when between a growing crop, since a check from cold may be given to its vegetation. Whereas it appears, plants receiving a shower of rain derive both heat and moisture from the same, provided the soil be left undisturbed for a time, until the land has again attained that degree of dryness when cultivation may be had recourse to with increased advantage.

"Again, the necessity of draining soils and situations where more moisture is retained than is required by growing crops is here proved, because if such lands be not drained, the escape of the extra water can only be effected through the means of evaporation, therefore at the loss of heat, and at the expense of great delay in the maturing of the crops, if not of their entire destruction.

"I shall now touch upon another subject—the disease in the potatoes. The same instruments, the thermometers, have exhibited one cause of the decay in the potatoes, and after this manner :—

"On July 19, 1845, weather being fine and wind south-west; time, between one and two o'clock.

Thermometer in the air, and shaded..	72 deg. F.
Thermometer 4 in. deep in the earth ..	72 "
Thermometer 10 in. ditto	65 "

"And on August 16, 1845, weather cloudy; wind north; time, at twelve o'clock—

Thermometer in the air shaded.....	58 deg. F.
Thermometer 9 in. deep in the air	55 "

"We here have in August a difference of temperature from that which prevailed in July equal to 10 degrees. This suddenness of change from heat to cold, and particularly at such a period of the year, must have injurious effects. We ourselves know, from every day's experience, the consequences of such changes upon our own bodies, by producing colds from the too immediate stoppage of perspiration. And may not growing plants

experience something of the same kind by their vegetation being so suddenly checked. The conclusion I have arrived at is, the great want of sun throughout the summer months, the long continuance of the wind from the north and north-east—added to these, the check above stated—are quite sufficient causes of the disease now so generally prevalent. Too many gentlemen are aware that the potato is not the only crop which has experienced injury this year, since the wheat, many fruits, and the hop, are alike deficient in what was presumed, from early appearances, would be their produce.

“It has been remarked by many agriculturists, that the potato and the wheat are found more diseased in the rich and highly manured lands than in the poor. Why is this? Because these lands were like an overfed stomach, and the difficulty of digestion from the want of heat was proportionally the greater.

“Believe me, sir,

“Yours very respectfully,

“W. BLAND.

“*Hartlip, Sittingbourne, Dec. 22, 1845.*”

—Maidstone Journal.

PROVISION TRADE OF LIVERPOOL.

In addition to their weekly report, we insert the following admirable summary of the provision trade of that town during the bygone year by Messrs. Adams and Banks:—

Liverpool, 29th of December, 1845.

The present year was ushered in with the highest prospects of commercial prosperity, and the realization of those prospects continued unabated during two-thirds of the year, and were blighted only by the probability of a defective harvest, and the abstraction of capital and energy from business pursuits to the share mania; the latter, however, brought the antidote with the bane, and the former, whether as regards the grain crops or green crops, are not turning out so defective as was anticipated. And although the commercial arm of this great country is at present a little paralyzed, it is not shortened. There is plenty of money in the country, the manufacturers are busily engaged, the artizans in receipt of good wages, and the mining population equally well off. The shipping interest has been doing well all the year, and still has undiminished good prospects. The agricultural population, as a whole, are better employed than formerly; and the formation of railways is finding employment for numerous branches of business, besides the superabundant labourers. Articles of food are moderate in price, and the consumption of everything enormous. Let the political horizon become settled, the corn-law question set at rest, confidence restored amongst the commercial community; enjoying, as we are, a universal peace, we may look forward to bright rather than dark spots in our commercial history, and a revival of healthy and active business as the spring advances.

It is natural that our provision trade with America, after three years' working, should be fully developed. It

is not quite so with regard to swine products. It was at first expected that bacon and hams would be sent forward freely. Such has not been the case, and the expectation of a trade cultivation in these articles is much abridged. A greater business was looked for in barrelled pork, but the value of this article in America being nearly equivalent to that of Irish or Hambro', importations have been in a great measure precluded thereby; saying nothing about the disparity in quality, the American proving much inferior to the other two. However, there have been some good lots of American imported, and we must not take it as a security that, because little has been done in this article this year, an extensive business is not yet to be cultivated in it. Lard has become a staple article of commerce, both for culinary purposes and pressers' and soapers' uses. With respect to beef, there can be no mistaking American superiority. The imports this year have been of uniform good quality, and nothing is now inquired for, for ship stores, but American beef. It has been steady in price all the year, scarcely differing 5 per cent. in value. It is considered to be remunerative to the packer and exporter, as well as importer here; and the manufacture of it is now so well understood there, and has so gained confidence here, that there is no doubt of this article (equally with lard) becoming a staple article of commerce. Under a 2s. duty a trade in butter will not be cultivated; the fluctuations in this market, and the risk of it becoming grease, operate against it, but we are likely to have some extent in butter shipped as grease from the States, and an effort may be made to cultivate a butter trade from Canada. But there is a prejudice against it, and it is not likely either to be extensive or profitable. There is very little doubt about the trade in cheese becoming extensive and permanent. Some of the imports have been equal in quality to any made in England, and the ready sale this article has met with nearly all through the year, with the good prices lately obtained for it, say as high as 60s. per cwt., will tend to encourage the trade in it. A better knowledge of packing the cheese for the English market, so as to prevent loss in cutting out, is the principal thing wanted, and that will no doubt be gained in time. The imports of these articles this year has been, 14,831 tierces, 3,437 barrels, of beef; 7,713 barrels of pork; 10,471 barrels, 49,452 kegs, of lard; 5,322 casks, 43,702 boxes, of Cheese. And the stocks now on hand are light of beef, pork, and cheese, but heavy of lard.

The import of foreign live stock into the kingdom increases steadily, principally from Holland, but we have no imports into this port, nor have any of the cattle been sent otherwise to this market. Considering it is now nearly four years since the passing of the tariff, little progress has been made in this trade, but a greater extent of business may be expected, as prices are sufficiently high to encourage it, and they are now in Holland preparing both cattle and sheep expressly and well suited for the English markets. The foreign imports so far have not had the effect of preventing prices advancing in this country, as the consumption of flesh-meat has increased in the last three years incalculably beyond those imports; even in this market alone this year the quan-

tity of stock sold more than in 1843, amounts to nearly as much as the whole of the year's import into the kingdom, which, in round numbers, may be put down at 13,000 beasts, 9,000 sheep, and 700 pigs, nearly all of which have been disposed of in the south-east and west of England, which markets are likely to be those destined for foreign stock; thus leaving the northern English markets for the bulk of Irish and Scotch produce, from whence to this market this year the supply has been abundant, being 70,180 beasts and 330,307 sheep and lambs, against 66,860 beasts and 280,474 sheep and lambs, in 1844, and 61,042 beasts and 265,055 sheep and lambs, in 1843. The quality of the stock has in a general way proved good, but the epidemic has shown itself more or less throughout the year. Of the excess of stock, the cattle have come from Ireland, but the sheep from Scotland. The business throughout the year has been steady, and fairly satisfactory, changing in conformity with the seasons, and prices fluctuating also only in accordance therewith, maintaining throughout about the average per centage of value over the previous year, which may be stated at from 5 to 7 per cent., leaving the top price of cattle at 6d., and sheep 7d. per lb., against 5½d. for cattle, and 6½d. for sheep, on the corresponding market of 1844. There was a great falling off in the store cattle business between Ireland and the south of England, at the close of the last and commencement of the present year, owing to the drought of 1844, and scarcity of keep during the winter and spring months in those districts. Respecting the supplies of fat stock for the coming spring, we do not look for scarcity, as there is plenty of keep both in England and Scotland; at the same time we doubt not the consumption will keep pace with the production, and thereby cause the present full value of all descriptions of stock to be maintained, if not increased, as the spring advances.

The supply of, and demand for, pigs throughout the present year has been exceedingly good, and prices so steady, that (like cattle) they have fluctuated only with the season, and that without any great or even the usual depression in the hottest or worst curing part of the year. During the last two years they have increased more in value than any other description of meat, being now 15s. per cwt. higher than at the close of 1843, the aggregate advance being 8s. per cwt. last, and 7s. per cwt. on the current year. We have not the same confidence in pigs maintaining their value as we have of cattle, as the advance in them has been great in proportion, and at the present high prices curers will be reluctant at going heavily into stock; the supply will, therefore, in a great measure regulate the prices. Hitherto this season it has been large, but how it will continue cannot be ascertained, as in Ireland it is differing in different parts of the country, according as the potato gathering has proved good, or defective, or otherwise.

The stock of butter at this time last year amounted only to about 8,000 firkins, which was gradually worked down to a mere nothing by the end of March, the price in the meantime remaining unaltered, ranging at about 96s. to 98s., so that last season ended well. New butter

came forward sparingly, and there being no good old to interfere with it, it sold as readily as brought forward, commencing about 110s. for fine Waterford but shortly receding to about 100s., which might be considered the opening price of the season. Up to June there was very little alteration; supplies then began to accumulate a little, and a reduction of 14s. to 16s. per cwt. took place in a fortnight, making our highest quotations about 84s.; and which has proved the lowest point of the season. From June until September the trade was extensive and steady, with very little accumulation of stock; the markets now began to rally, and ever since prices in the Irish markets have been nearly as high as with us. With free buying there, the shippers looking forward rather to advantage in holding stock than regulating their purchases, so as to realize a legitimate trade profit on the transaction of the day. This course proved fortunate at the fall of last year, which perhaps led to the same measure this season, but with quite a different result; although for a few weeks it assumed the desired position, prices running up to 93s., but changed again early in November, since which they have gradually given way about 6s. per cwt., the stock accumulating, and now amounting to upwards of 20,000 firkins. The make of English butter this year has been very considerably greater than last, but has interfered very little with the sale of Irish, no doubt owing to the greater consumption generally through the country. The import this year having been equal to 372,611 firkins, against 364,680 firkins in 1844, and 359,916 firkins in 1843. Lard has been very saleable all through the year at good prices. Bacon is now too high to engage the attention of speculative buyers, and is unprofitable to the retailers; therefore is likely to be a dull article of sale. Of barrelled pork there is no stock, and, as there is very little American coming forward, it is likely to remain saleable for some time, at about the present prices.

Nothing can be said at present about the corn trade, except that it is a great hardship for all classes connected with it to have a momentous business like it virtually suspended either by want of confidence or defection in legislative enactments. The quantity of bread stuff coming from the United States is great, so that with the bonded grain now in the kingdom, and that on the way, the granaries in England are likely to be sufficiently stored for the consumption of the country until the next harvest.

THE WOOL TRADE.

LIVERPOOL, JAN. 1.—The favourable views we expressed in our last annual circular of the prospects of the wool trade were fully realized during the first six months of 1845. An extent of consumption probably without precedent in the same period of time was accompanied by an unusual steadiness of price, and freedom from any appearance of speculation or overtrading; and yet there has seldom been a period, with the elements of the trade so sound and promising, that resulted in so little profit to those engaged, whether importer, stapler, or manufacturer. This we principally attribute to the relatively high price of the raw material.

The early months of the year were marked by unusual activity. The protracted winter gave an extension to the home trade whilst the continental demand, particularly from Germany, was good. Some inconvenience was experienced by the export houses from the navigation continuing closed till so late a period. In many cases goods ordered arrived too late for the Leipsic Easter Fair, which may, to some extent, interfere with future orders. In June and July it was felt that the continued prosperity of the wool trade would much depend on the result of the approaching harvest. The general feeling being favourable imparted confidence to transactions, and led to an improvement in the value of most descriptions of wool. These anticipations having, unfortunately, not been realized, the wheat crop being reported as deficient in quantity and inferior in quality, with the admitted failure of the potato crop to a serious extent, have for the last few months subjected the trade to feverish excitement, and much limited the amount of business; other causes have contributed to this result. The large absorption of trading capital in railway and other schemes; the consequent increased value of money and restricted banking accommodation; and, more than all, the narrowed consuming power, arising from the large advance in the cost of subsistence to the great bulk of the population, have operated injuriously on the trade during that period. Notwithstanding these obstructions, we report a less depreciation in value than might have been expected. Stocks of goods are generally light, and of the raw material by no means excessive. We must not omit to notice the intense anxiety with which every section of the trade is awaiting the expected legislative action on the corn laws. Should it terminate in the total abandonment of all import duties on corn and provisions, the change will be of incalculable advantage to the wool trade at large; and we believe that no branch of it will reap more substantial benefit than the home wool growers.

The growing importance of this place, as a wool market, is becoming more apparent every year, as shown by the rapidly increasing imports, and from its contiguity to the manufacturing districts of Yorkshire, Wales, and Scotland, it will, no doubt, before long command a much larger share of the trade. Our receipts from Australia have hitherto been comparatively insignificant, London continuing to take by far the greatest portion of Colonial wool. We are surprised at this, when the many advantages of this port are considered. Its vicinity to numerous consuming districts is certain to insure a large attendance of the smaller manufacturers, who form the chief support of the public sales. In London the excessive quantities brought forward at one series (sometimes exceeding 30,000 bales), unduly limits the time for examination; operates, even under favourable circumstances, against prices, and, in dull times, is disastrous in its tendency. We are convinced that if a more equal distribution of imports were established the return to merchants would be more satisfactory.

AUSTRALIAN.—The total receipts from these colonies show a steady increase, which will be much extended by the enhanced value of sheep having put a stop to the boiling down for tallow. The condition of the last clip has been generally satisfactory. By shearing earlier the burr was partially avoided, and the season seems to have been favourable for washing. Previously to the first arrivals, which were much earlier than usual, the stocks at home were nearly exhausted. The accounts from the German fairs, stated an unusual demand for low and middle qualities for their own consumption; while the French were known to be operating largely in Spain. These circumstances caused the first public sales to go off with great spirit. In October trade began to slacken, though the result of the public sales in London during that month was quite as favourable as could be ex-

pected. The large arrivals up to this date (which were, in fact, larger than apparent, owing to the increased size of the bags) induced the wealthy dealer and consumer to stock freely, under the impression, which we think well founded, that the entire import will be required before next season. We are glad to notice throughout the year an improved demand for the better qualities which will be encouragement to the growers who attend to their flocks. Combing wools have been little in request, owing to the depression of the worsted trade. This branch is beginning to rally, and promises a better demand in the spring.

CAPE OF GOOD HOPE.—The shipments from this quarter shew great improvement, amply testified by the high rates the best flocks have commanded during the season. This result of judicious management in selection and careful packing will, we feel assured, be sufficient encouragement to perseverance. It is only by such means that former prejudices can be overcome. The best parcels now take equal rank with those from Australia, and are purchased by the trade with full confidence, whilst the more mixed and inferior kinds are an article of doubtful sale. The system of packing unwashed or yolkly fleeces with the washed is most prejudicial, and cannot be too strongly pointed out.

SPANISH.—Our market has not kept pace with the advanced rates paid for this description on the other side, occasioned by French competition. It has, therefore, been difficult to effect sales at remunerating prices to the importer. The demand, of late, has been chiefly confined to middle qualities.

PORTUGAL.—Best R's have been readily saleable. Most other kinds have been little sought after.

OPORTO MOUNTAIN.—The demand has been chiefly confined to the best combing parcels, other kinds have been comparatively neglected.

UNITED STATES.—The import from this quarter affords a striking proof of the beneficial effect of the remission of the wool duty. It has excited great interest and surprise in the trade, and may be considered the greatest novelty of the year. The quantity received to this period, as an *experiment*, exceeds 3,800 bales, comprising a great variety of qualities. It is to be regretted that the unfavourable turn of trade has been against the operation. In washing and preparing the wools sufficient pains have not been taken; and there is want of discrimination in the selection of qualities. So far as used they have been highly approved; and we have full confidence that, if got up with care, they would be highly esteemed in this country. The American prairies afford peculiar advantages for the growth of wool; and we believe this branch of the trade will become one of great and increasing importance.

PERUVIAN AND ALPACA.—Till within the last few months the supply of sheep's wool was limited. It is now increased, but the demand is restricted at rather declining prices of late. The imports of Alpaca have been rather large. There are no means of ascertaining the exact quantity, but a careful investigation leads us to estimate it at about 18,000 ballots of 80 lbs. each. It must be borne in mind that, during 1844, great difficulties attended the shipment, and the apparent excess of 1845 represents a portion of the previous year's clip. For the first six months there was great activity, and consumers bought freely for arrival. The demand has since been heavy, at almost nominal prices. The high rates abroad render it probable that considerable loss will attend the import.

BUENOS AYRES, &c.—Good clean parcels have been in fair request. All other kinds have been rather heavy of sale, and at declining prices, in consequence of the expense and difficulty in getting them cleaned. The unsettled state of the trade on the

other side will no doubt interfere with shipment, and may cause an improved demand.

EAST INDIA.—Under this head we notice a considerable increase, and it is satisfactory to observe that the demand has fully kept pace with it. More attention has been paid to the assortment, which it is desirable should be persevered in. The increasing demand for low wools will enable the trade to take any quantity that can be furnished.

RUSSIA.—Here the increase appears considerable; but the imports have arrived much earlier than usual. The trade generally has been heavy, except for good combing parcels, which have throughout commanded full prices. The greater portion has been of an inferior description.

MEDITERRANEAN.—The items under this head, including Italian, Greek, Smyrna, and the varieties of Turkey wools, have been dull of sale at prices unremunerating to the importer. Some quantity of Egyptian wool has been received, a description which has not before found its way to this country. It is clean and well washed, and a portion is well adapted for combing, but there is a great deal of short mixed with it. Greater care is required in the assortment. The decline in English skin wools has affected its value. We doubt if it will answer, except when English combing wools rule high.

ENGLISH, SCOTCH, and IRISH.—Notwithstanding the depression in the worsted trade, the consumption has reached a full average. Prices have varied little throughout the year, the general range not varying to any material extent from this period last year. Stocks with staplers and manufacturers are light, and not extensive with the farmers, who show more disposition to hold than give way at present.

In exports the principal feature is the increased amount of woollens sent to the East, which, we understand, form one of the most lucrative branches of the trade with China, the rising importance of which it is difficult to estimate. The exports of woollens to the United States, which, for some years past, have been diminishing, continue to recede; but the tone of the President's message on commercial affairs leads to the expectation that this important market may again revive.

HUGHES & RONALD.

A CHEAP AND EXCELLENT MANURE FOR SWEDES.

STR.—I beg to inform your readers of a very cheap and excellent manure, which I last year made use of, and which exceeded my most sanguine expectations. I had a large heap of turf ashes remaining on hand after the turnip season of 1843; and last winter I made my boys save a barrow-full or two every morning of the shortest horse-dung in cleaning out the stables; that I had wheeled into an out-house, and mixed with the ashes, a layer of one and the other, till the ashes were all used. I soon found the heap was in a state of glowing heat, though no steam was ever perceptible; a rapid decomposition took place, and when the time arrived for using it, it appeared like very fine moulds. This I drilled with Swedes, and in one piece where there was no other manure, I drilled 50 bushels, to the acre, and the plants were fit for the hoe in three weeks from the time of sowing. This year I have no turf ashes, and am using coal ashes in the same way, and intend to drill about 30 bushels per acre. My heap is now extremely warm and smells strong, but there is no appearance of any evaporation. Perhaps I should say that my land is a flinty and chalky brash, with a gravelly or chalky subsoil.

I am, Mr. Editor, your obedient servant,

A WILTSHIRE FARMER.

THE UNJUST OPERATION OF THE TITHE ACT.

SIR.—I am anxious to call your attention, and that of my brother farmers, to the above subject. Parliament in passing the tithe act, anticipated not a change in the protection the landed interest then enjoyed, and consequently framed that measure so as to be only applicable to a fixed state of the import duties. It enacted that the average price of corn for seven years, ending on Christmas day of any year, should be taken to fix the rent-charge for the year following. This would on the whole have been fair, had no alteration been made in the value of corn by a subsequent law. But when the corn law of 1842 lowered the value of our crops $12\frac{1}{2}$ per cent., it entirely disarranged the machinery of the tithe act; thus the septennial averages, which fixed the rent-charge for 1843, being taken from the price of corn when protection had enhanced it $12\frac{1}{2}$ per cent. above its value for that year, it follows of course that the *just* sum then to have been paid in lieu of tithes was exactly one-eighth, or $12\frac{1}{2}$ per cent. less than these averages indicated. For every 20s. fixed on the farmer by these averages, he ought to have paid only as follows:—For 1843, 17s. 6d.; for 1844 (when only *six* of those highly protected years would act on the averages), 17s. 10d.; for 1845, 18s. $2\frac{1}{2}$ d.; for 1846, 18s. 7d.; for 1847, 18s. $11\frac{1}{2}$ d.; for 1848, 19s. 4d.; for 1849, 19s. $8\frac{1}{2}$ d.: in 1850 they would again fix the right sum. Arrived at this point, the farmer, after paying a large sum most unjustly, and one which the framers of the Tithe Act never intended, would find, so far as the averages are concerned, his rent-charge again pretty right.

Should any further alteration of the corn laws take place, a simple remedy for this injustice may be obtained by altering the term over which the averages extend, and by taking an ANNUAL average only to fix the rent-charge.

Trusting that you and other *real* "farmers' friends" will manfully come forward to assist us at this critical period, I beg to subscribe myself your obedient servant,

A NORFOLK FARMER.

HARLESTON FARMERS' CLUB.—On the 14th of January, the subject for discussion was:—"Oil-cakes *v.* linseed; the relative prices at which either is cheaper; and the most economical mode of using the latter?" Resolved:—"As this subject was introduced rather to direct attention to the use of linseed than with a view of obtaining opinions on it, and as the meeting will, it is fully anticipated, have this effect, it is resolved to defer answering the questions proposed by the introducer till further trials (which the club recommends should be immediately made) shall have given greater authority to the decision." As far, however, as the experience of the members has hitherto gone, it is believed that linseed will prove a very valuable addition to our fattening food for cattle; forming an excellent medium for consuming our own corn, which it is thought should always be mixed with the seed in about the fol-

lowing proportions: three-fifths corn and two-fifths seed. The club considers that corn and seed, thus mixed, will be found cheaper than either alone or than oil cake; but it is inclined to doubt the practice hitherto adopted in this county, of cooking the seed more than the corn, believing that the former is little and the latter largely benefited by it. But, whilst giving this strong opinion in favour of cooking the corn where practicable, and thinking that barley should never be used without, the club have evidence that ground beans and peas, mixed with crushed linseed and given dry, have been used with great success.

ON BANKING.

TO THE EDITOR OF THE FARMER'S MAGAZINE.

SIR,—I wish J. W. S., in your December number, in reply to my statement on banking, had written in better temper. He calls me the "precious Daniel," and talks about my "customers." Now I beg to tell him that I never sat at "the receipt of custom"—he evidently thinks me a "rum customer."

He pretends to laugh at a blunder in the calculation of interest; but I would fain ask him—does not the holder of a £50 share, paying six per cent. interest, get £3 for his year's interest? If so, I am right; and he has discovered a "mare's nest."

I fear you must have fallen much in the opinion of J. W. S. by giving me insertion. He feigns to pity my ignorance; but he has not removed it; nor can I "mend my manners," or "change my name," although I have read all his remarks about the "advantages to be derived," and the "splendid fortunes amassed since the war."

I fear they are only in his own fruitful imagination; and unless he favours me with something more to the point about "advantages," and "splendid fortunes amassed," I must remain,

Jan. 22, 1846.

DANIEL DUBIOUS.

AGRICULTURAL QUERIES.

TO THE EDITOR OF THE FARMER'S MAGAZINE.

SIR,—An article appears in the November number of 1845, on Harvesting Beans and Peas; and in alluding to the distance between the rows or drills, the writer observes it should never be less than 27 inches. Now, having had but little experience in bean culture, I am desirous of knowing whether the beans should be planted in *single* or *double* rows at this distance apart; and how they will answer upon ridges, the land manured and prepared in the autumn in a similar manner as for turnips; and whether the value of the crop would be enhanced by an admixture of peas with the beans—if so, in what

proportion. The insertion of the above questions will confer an obligation on,

Your obedient servant,
A MEMBER OF THE NORTH WALSHAM
FARMERS' CLUB.

SIR,—Residing in a neighbourhood where there are many large beech and other woods, and with a view of giving employment during the winter months to women and children, who are often then without employment, I should feel much obliged to you or some *practical* correspondent to inform me if the leaves can be crushed into manure for agricultural purposes, as follows:—

1st.—By collecting them together in large heaps and mixing yard manure with them; if so, in what proportion, what time, and the after management.

2nd.—Will they pay for collecting together to rot as manure without dung, or by adding some cheap artificial manure.

3rd.—If burning them for the ashes as manure in the months of March and April; or any other suggestion preferable, will be thankfully received by one who feels a great pleasure, at all seasons of the year, to see every person employed when the weather will permit.

I am, Sir, yours, &c.,

A Constant Reader of your Paper.

North Hants, Jan. 12, 1846.

A correspondent wishes to know where he can procure "a ram of the old great, high-standing, black-faced, horned Norfolk breed." Perhaps some of our readers will be able to inform him through our columns; but we thought that the race was long since superseded by something more advantageous.

ANSWER TO AGRICULTURAL QUERY.

TO THE EDITOR OF THE MARK LANE EXPRESS.

SIR,—In your paper of the 19th, I observe a request from a correspondent to be furnished with some information derived from practice regarding the use of leaves as manure.

I have been in the habit of gathering them as soon as fallen, for the last four or five years, and carting them into the farm-yard, as a means of absorbing the liquid which flows in winter from the manure heap, placing them at the bottom of the yard, and throwing the litter, as it comes from the sheds, regularly over them. This, with repeated trampling from the stock when turned loose, incorporates the leaves so effectually with the rest of the manure as to improve, in my estimation, its quality, and certainly its quantity.

If these remarks are considered worth insertion, you are welcome to them.

I would further remark that it is chiefly on light land, where the straw is deficient, that leaves are of value, and that I have heard that beech leaves, gathered dry, make excellent bedding for man or beast. I am, sir,

Your obedient servant,

Jan. 20th, 1846.

AGRICOLA.

METEOROLOGICAL DIARY.

BAROMETER.			THERMOMETER.			WIND AND STATE.		ATMOSPHERE.			
Day.	8 a.m.	10 p.m.	Min.	Max.	10 p.m.	Direction.	Force.	8 a.m.	2 p. m.	10 p. m.	
Dec.	21	29.41	29.78	33	39	29	North	strong	cloudy	fine	fine
	22	29.63	29.00	27	44	39	S.W., W. by N.	strong	cloudy	cloudy	fine
	23	29.13	29.70	34	42	37	North	brisk	cloudy	sun	fine
	24	30.05	30.19	33	40	30	N. by West.	gentle	fine	sun	fine
	25	30.20	30.22	29	42	34	S.W., N.W.	gentle	cloudy	cloudy	fine
	26	30.10	29.74	31	48	45	S. West	variable	cloudy	cloudy	cloudy
	27	30.03	29.79	37	46	45	S. West	strong	fine	cloudy	cloudy
	28	29.55	29.80	44	50	36	S.W., North	strong	cloudy	cloudy	fine
	29	30.00	29.89	28	48	48	S.E., S.W.	strong	fine	cloudy	cloudy
	30	29.80	29.95	46	54	43	S.W., W. by N	forcible	cloudy	cloudy	fine
Jan.	31	30.13	29.56	32	48	48	S.W., S. by E.	forcible	cloudy	cloudy	cloudy
	1	29.72	30.00	38	46	35	W.N.W.	lively	fine	sun	fine
	2	30.20	30.39	32	38	31	N. by W., S.E.	gentle	fine	sun	fine
	3	30.41	30.27	26	38	36	S.E. by South	gentle	fine	cloudy	cloudy
	4	29.98	30.00	36	42	34	N. West	gentle	cloudy	sun	fine
	5	30.08	30.10	29	38	28	N.W., South	gentle	fine	sun	fine
	6	30.06	30.00	26	44	44	S.E., W. by S.	gentle	haze	haze	cloudy
	7	30.19	30.30	43	47	44	W. by South	gentle	cloudy	cloudy	fine
	8	30.40	30.53	44	47	44	West	gentle	cloudy	cloudy	cloudy
	9	30.60	30.55	39	44	39	South	gentle	cloudy	cloudy	cloudy
10	30.48	30.37	36	43	37	S. West	gentle	cloudy	cloudy	cloudy	
11	30.53	30.27	36	40	37	S.S. East	gentle	cloudy	cloudy	cloudy	
12	30.05	29.85	33	35	33	S.S. East	gentle	cloudy	cloudy	cloudy	
13	29.79	29.55	31	42	38	S.S. East	gentle	cloudy	cloudy	fine	
14	29.43	29.53	36	44	43	S.S. East	gentle	cloudy	cloudy	cloudy	
15	29.57	29.73	39	46	42	S. West	gentle	cloudy	cloudy	cloudy	
16	29.86	29.76	42	46	44	S. East	gentle	haze	cloudy	cloudy	
17	29.69	29.70	38	47	40	Southerly	gentle	cloudy	cloudy	cloudy	
18	29.70	29.64	38	41	41	S.E., East	brisk	fog	fog	fog	
19	29.20	28.93	40	51	49	S. West	strong	cloudy	cloudy	cloudy	
20	29.30	29.50	40	45	38	S.W., West	strong	fine	sun	fine	

ESTIMATED AVERAGES OF JANUARY.

Barometer.		Thermometer.			North and N. East Winds.. 8 days. East and to South 3¼ South and South West..... 8¼ West and to North 11
High.	Low.	High.	Low.	Mean.	
30.77	28.89	52	11	36.1	
Real Average Temperature of the above period.					
High.	Low.	Mean.			
44	35.2	39.6			

WEATHER AND PHENOMENA.—December 21, snow, fierce wind preceding; frosty evening. 22, snow, not lying; mild change. 23, fine lively day. 24, very clear and beautiful. 25, rain; changeable; cool evening. 26, slight frost; sudden change. 27, rain; boisterous wind. 28, rain; fine evening. 29, rain; strong wind; very changeable. 30 and 31, rain on both days; high wind in the evening of the last day. Two days with a little snow, and seven with more or less rain, in the above period. 1845.—January 1, very beautiful and sunny. 2, the same; frosty morning. 3, after keen frost, changeable. 4, airy; clouds richly crimson tinted; a sprinkle of rain. 5, beautiful; keen frost morning and night. 6, very hazy. 7, barometer steadily rises, with a westerly

wind. 8 and 9, extraordinary altitude of the mercury, not seen so high here for 15 years; yet totally cloudy. 10 to 15, inclusive, perfect calm, with slight deviations and sunless gloom, with high temperature for the season. 16, a partial clearing, by a few breaks in the clouds. 17, gloomy, and a few showers. 18, dense fog; every plant and tree dripping till after sunset. 19, exceedingly wet. 20, fierce wind all night; one heavy shower at 2 p.m.; otherwise fine.

LUNATIONS.—First quarter, 4th day, 2h. 25m. afternoon. Full moon, 12th day, 2h. 2m. afternoon. Last quarter, 20th day, 3h. 52m. afternoon.

REMARKS REFERRING TO AGRICULTURE.—The very abundant rains of December saturated the land, and, for a little time, checked the plough.

With that month wind and rain ceased; and, with the exception of a mere hint on the 4th and 17th, January was dry, exceedingly gloomy, and calm till the 19th. During this long period the labours of the field went on well; the wheats advanced little, considering the extreme mildness of the weather. Everything is quiet, and indeed

healthy; the only sign of winter luxuriance is seen in those fields (sadly too many) in which so much corn was shed at harvest, that the plants actually clothe the surface, and are exceedingly rank. A milder winter, for the comfort of the poor, is hardly within recollection.

J. TOWERS.

Maidenhead Thicket.

CALENDAR OF HORTICULTURE—FEBRUARY.

Every circumstance during the first fortnight of the late month was favourable, unless open weather be deemed the reverse. With December the rain and storms of wind ceased; but the supply of water had been so ample, that the ground remained for a time too wet, and labour was partially suspended.

A fine open winter, provided that February prove cool and showery, may be esteemed a harbinger of a good spring.

There were a few frosty nights, but not so severe as injuriously to check vegetation; and yet it should appear that, considering the mildness of temperature, there were no precocious advances, unless the blooming of primroses, oxlips, and white violets, with here and there a few remaining China roses, be esteemed such. The forcing-gardener was highly favoured by the weather, a little fire going far, and the nights so warm as to require no extraordinary attention.

Many persons had planted potatoes, and sown peas and beans; and among other circumstances of interest, we learned from a person who had acted as steward or bailiff in most extensive concerns, that he had succeeded admirably, in Wales, with potatoes sown in Autumn, so as to leave no manner of doubt that, if set deep enough and covered with earth as a ridge, the crop would be superior. The damaged potatoes that we ourselves collected in September, were partly sown in November; and some placed in tubs and troughs, with scarcely any other protection than a barn, were found covered at the rose-ends with strong short eyes expanding in the healthiest manner. These, if no severe frost come on, will assuredly make excellent planting sets in March, provided the healthy portion, whence the shoots emerge, be cut off, and the wounded surface be coated with gypsum or slaked lime.

VEGETABLE GARDEN.

First and second week, sow early succession crops of Charlton and Prussian peas and beans. It is advisable to recur to the practice recommended long since by the celebrated William Speechley, and to sow broad beans along the rows of potatoes, particularly those affected by the late malady. We last year saw a very large plantation so arranged; the beans did not interfere with the growth of the potatoes; both flourished together, the former yield

ing a very fine crop, and the latter one as good as the then prevailing malady would permit.

If any crops are fairly above ground, hasten to earth them, stirring the ground so as to loosen it a little, but always in fine weather.

Sow a few rows of green Cos and Cilicia lettuce, salads of several kinds, and a bed of radish and onions; radish likes loose and friable ground, lettuce richly manured mellow earth, and onion that which is deeply pulverized, with a fair quantity of bone dust, and some ammoniacal substance blended with reduced manure. Deep sowing is not required, and for large bulbs it often answers well to beat the prepared soil with a turf-beater, till it becomes so solid that the surface may be scratched with a pointed tool to a little depth; in these lines the seeds are sprinkled, three or four to the inch, and just covered over with screened vegetable mould and sand. The seeds will rise favourably and root deeply, but the bulbs will lie flat on the ground and ripen particularly well. At the same time, and in like manner, little onions (Spanish or Tripoli) grown in poor soil last year, and not larger than good-sized peas, being set along the lines, five inches apart, and pressed firmly, will produce extremely fine onions.

An extremely early crop of middle-sized onions can be obtained by adopting the above practice with the bulbs of the last year, which, though perfectly matured, had not become larger than walnuts. These should be set eight or nine inches asunder, about the third week; they will grow, and attempt to produce a flower-stem: this, however, should be cut or pinched short off; another stem will then arise, and perhaps be followed by a third; but, being checked, the onions will appear to subdivide, though in fact they are pre-organized latent buds which thus develop, and finally become nice valuable bulbs, two, three, or four to the plant, about the middle of July, if the season be showery and yet warm.

Spinach may now be sown, a row or two twice in the month, of the round-leaved smooth-seeded variety. The winter spinach of August ought to be thinned for use to proper distances as it advances, hoeing the ground between the rows after the gathering.

Carrots, parsnips, beet-root, prepare ground for, bearing in mind that for the first the fresher and more sandy the ground the better. Belgian white carrot is more indifferent to soil. Parsnip does well for stronger loam, provided the ground be deep and not stony. Beet generally succeed if thinned to nine inches apart; but all require that the manure be placed below, and not about the future roots. The last week is early enough for sowing.

Garlick and shallots are planted by division of the bulbs or cloves, in rows nine inches asunder, the bulbs six inches apart in the rows. The sweet-herbs, marjoram, hyssop, thyme, savory—also fennel, burnet, angelica—are sown about the end; but most of the former succeed best by division of the roots, though the work may be deferred till spring or autumn.

FORCED, OR EXCITED VEGETABLES.

Kidney-beans are raised with facility in a stove or hot-house, especially if heated by water and a tank. The red spider—so every kind of plant *acarus* is called—is kept more readily under in such moist heat. Celery plants ought now to be raised in like situations, sown in a box of mould—also small salads; indeed, any small vegetable, and cauliflower, peas in boxes, &c., &c. These, however, should have gentle heat only, and not be suffered to remain till drawn up. The floor of a good vinery answers well; but where there are none of these appliances, frames over a gentle hot-bed of leaves must be resorted to.

FRUIT DEPARTMENT.

Currants and gooseberries, finish the pruning of early in the month, observing the directions before given; then fork the spaces, and cover the surface with three inches of manure.

Raspberries should be supported by stakes or trellis, sloping to the north, in order to give free scope to the young wood; treat the ground in the way just recommended.

Plant the above berry-bearing shrubs in fresh loam, and mulch the soil over the roots, to prevent rapid evaporation in spring. This precaution ought always to be observed, for then one thorough watering in the warm weather of March will do excellent and permanent service.

Finish the pruning and nailing of apricots, plums, cherries, peaches, and nectarines, before the flower-bud be much swollen then wash the trees with soap suds.

Strawberries.—If the weather be mild in the last week, dress the plants, removing dead leaves and intruding runners, and scatter rich earth among the plants, because the best roots come below the centre of the new developments, and not from the old woody roots. But, in fact, if in making new plan-

tations, the plants were placed 14 or 15 inches asunder every way, the rows in filling up would always be new, in consequence of the lateral offsets forming yearly, and the best runners taking root (if properly placed) in the mid-spaces; thus, by the time the allotted ground shall be filled, the plantation ought to be eradicated directly after the crop of that season shall be taken.

Fruit-trees can be safely planted in February, provided that watering and mulching be attended to.

FRUITS IN THE FORCING DEPARTMENT.

Excite the later vinery, syringing copiously. Begin with a heat of 50° to 55°, and about every week raise the heat 5° by fire or hot water. Some persons strenuously urge the introduction of a mass of fresh stable dung, raised in a ridge along the centre of the house. The heat from it is certainly moist and genial, and moreover feeble ammoniacal gases are diffused, which tend to check insects.

The first vinery ought to be raised to 70° or more, as the flowers open; but 65° is a perfectly safe degree, to which the thermometer may recede progressively till the hour of sunrise. A check must be guarded against, and this is the reason why the house is left warm at retiring for the night, otherwise there is little advantage in maintaining a high degree during the absence of sun. Every fruitful shoot should be regularly stopped.

Pineapples in the first stage (called nursings) must be kept growing at 65° by night and 70° to 80° by day. A moderate bottom heat (80°) by a bed of oak-leaves, covered with a stratum of tan, will bring them on finely; but more of this in March, as also of plants of the second stage (successions). Brick-pits, with strong dung linings outside, aided by a hot water apparatus, in capacity suitable to the extent of the erections, are most efficient in the culture of pine plants in both stages. A water tank might supply the bottom heat. A pine stove is appropriate to the last or fruiting stage, and herein the day heat (without sun) should be 75°.

Peach house and pit.—Plenty of air during sunshine, syringing—fumigation, if the green fly appear, and even as a preventive—with artificial heat never exceeding 50° to 55° till the fruit be stoned, are the essentials.

Cucumbers in pots are to be always stopped at a fruit; and thus, if assisted, an atmospheric and bottom heat of 70° and 80° will be progressively fruitful.

Melons are now sown in pans of rich mould in genial warmth, to be treated hereafter, as in due season will be mentioned. The Persian Housainées, Cirmck, &c., &c., are most desirable.

Recommending neatness in every department, more particular directions are deferred till March.

GENERAL AGRICULTURAL REPORT FOR JANUARY

Since the date of our last report, the weather throughout the United Kingdom, has been unusually mild for the time of year. The heavy rains which have fallen in most quarters have had the effect of flooding many of the lowland districts, and thereby completely putting a stop to out-door farm operations; as, however, these are sufficiently forward, this excess of moisture is not expected to produce any very unfavourable results in this particular. As might be expected, the winter wheats have grown somewhat more rapidly than could be desired; yet, on the whole, our accounts are tolerably satisfactory. Winter pride has, it is true, presented itself in some parts; but a few sharp frosts would speedily effect a change that is, unquestionably, desirable at this moment.

We scarcely ever recollect a period in which the usual operations in the corn trade have been so completely interrupted, nay, almost brought to a stand still, as within the last three weeks, and all arising from the rumours afloat on the subject of the proposed changes in the existing corn-laws. Although the various markets have been very moderately supplied with wheat, arising from the unwillingness on the part of the growers to depress prices by sending forward larger supplies of the article than the dealers have been disposed to purchase: the demand for that description of produce has ruled very dull, and the quotations have receded from 2s. to 4s. per quarter. All other grain has participated in the same heaviness, and lower rates have been submitted to in almost every instance. As Sir Robert Peel's scheme is now known, and most of the larger millers and others very short of stock, an improved demand may shortly be expected; but we have very great doubts whether an increased trade, which may be only a temporary one, will secure to the farmers better prices. It must not be forgotten that, notwithstanding the so-much-complained-of scarcity abroad, we have nearly, or quite, one million quarters of foreign wheat at this time in warehouse; and which, from its being gradually brought forward for sale, will tend to check any improvement in the value of home grown wheats. We cannot, also, divest ourselves of the belief that the produce of last year's crops has been considerably under estimated by many parties; though, we are ready to admit, that the quality was beneath an average. To counterbalance that deficiency in some manner, the available supplies of old wheats have been good, and which have found a preference amongst the dealers. Again, as to the crop of potatoes, there can be no question whatever that a larger portion of it was destroyed by the unusually wet

weather experienced during the greater portion of 1844; yet, contrary to almost general expectation, a decided improvement has been observed in the supplies of that valuable root received in the metropolis, and which have proved more than equal to the wants of the consumers. Facts are stubborn things—that our observations are founded in fact, we assert without the slightest hesitation. From a return which has recently been published, it would appear that the receipts of potatoes at the water-side, during the last three months of 1845, were far beneath those at the corresponding season in 1844. So far so good—but the question to consider is, what have been the arrivals by land carriage? We have made the most careful inquiries on the subject, and find that, by railway, steam boat and waggon conveyance the supplies, though not of the best quality, have exceeded those reported for a series of years past. These arrivals have, of course, had considerable influence upon value; and so far as our experience carries us, knowing as we do, that the actual *growth* in 1845, was the largest on record; we see no reason to apprehend very high rates during the next three months, by the end of which time the consumption will be pretty nearly determined.

Such has been the abundance of pasture-herbage and other pabulum, that great difficulty has been experienced by the graziers in procuring an adequate quantity of stock to consume it. Hence both beasts and sheep have fared remarkably well in the whole of our great agricultural districts.

The imports of live stock under the new tariff have been considerably on the increase, and of improved quality. And, from information which has lately reached us, it is placed beyond a doubt they will continue large for some time hence. For particulars of the arrivals during the month, we refer our readers to the "Review of the Cattle Trade" in another column.

Our advices from Scotland state that the corn trade has been in a very depressed state, arising from the dull accounts received from England, and the increased receipts of flour from Canada. Prices have, in consequence, suffered a general decline. The potato crop is still badly represented; yet the shipments to the south have been liberal.

In Ireland—where the potato disease is felt more, perhaps than in any other portion of the United Kingdom—the greatest distress still prevails amongst the poorer classes; yet the corn trade has been far from active. The shipments of wheat and other produce to Liverpool have been good; those to other parts of England small.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

The most important matter which arrests our attention this month is the importation of live stock under the new tariff. Notwithstanding we have arrived at a period of the year when nearly all parties anticipated very limited arrivals, from the fact of the elements precluding the possibility of shipping animals from the different ports in Holland, THE ARRIVALS SINCE OUR LAST HAVE CONSIDERABLY EXCEEDED THOSE OF ANY MONTH DURING THE WHOLE OF 1845. The truth of these remarks will be clearly apparent when we state that, from the 8th to the 26th of January, current year, they amounted to FOURTEEN HUNDRED AND SIXTY OXEN AND COWS, SEVENTY PIGS, AND TWO THOUSAND THREE HUNDRED SHEEP into London, 200 beasts and 400 sheep into Hull, from Rotterdam, Schiedam, and Harlingen. Respecting the quality of these arrivals, we may observe that they have, generally speaking, come to hand in good condition, though of course some of them have been received in middling condition. As comparisons are useful, we have to intimate that, at the same time in 1845, only 142 beasts and 200 sheep were received into this country from abroad—a most decided proof of the correctness of the views we have so long entertained respecting Sir Robert Peel's measure—a measure fraught with prospective ruin to the agricultural body. Many of the Dutch ports being now blocked up with ice, the steamers have ceased running; yet the owners have procured several vessels, built expressly for the purpose, into which both the beasts and sheep are now conducted over at least a mile of ice! This clearly shows the energy and determination of the Dutch graziers to avail themselves of our markets, which, from the high prices ruling here, have proved very remunerative to them. The beasts which we reported in July last as fattening in the various Dutch distilleries have now all arrived, and yet there are now upwards of 12,000 fattening for shipment hither: so that it is placed beyond a doubt—whatever may be advanced to the contrary—that future arrivals will be even on a more extensive scale than we have yet had occasion to report. Having seen many of the beasts slaughtered, we can assert that they carry a very large quantity of internal fat, hence continue in favour with the butchers. The sheep are not to say first rate, consequently have not commanded much attention. The former have sold at from £12 to £21; the latter 32s. to 47s. per head. Several packages of dead meat have come to hand from Hamburg,

and which have sold at prices varying from 3s. to 3s. 4d. per 8lbs. The attempt to fatten foreign stock in this country has been abandoned, from the severe losses which the speculators sustained last year; indeed, it is obvious that the change of food is highly detrimental to both beasts and sheep.

It affords us great pleasure to be enabled to state that very few cases of epidemic or the foot rot have come under our observation, though we much fear that, should the present wet weather continue for any length of time, the sheep will become severe sufferers.

The supplies of stock on offer in Smithfield have been remarkably good as respects the beasts, but those of sheep have been unusually small, but of very superior quality; in fact, we scarcely ever recollect to have seen better collections of stock at any previous corresponding periods of the year. On the whole, the beef trade—arising in a great measure from the increasing importations of foreign beasts—has ruled dull, and prices have had a downward tendency. In all other kinds of stock a good business has been doing at higher currencies. The total supplies have been as under:—

Beasts	. .	16,420	Head.
Sheep	. .	87,500	
Calves	. .	800	
Pigs	. .	2,512	

At the same time last year the numbers stood thus:—

Beasts	. .	13,802	Head.
Sheep	. .	112,690	
Calves	. .	783	
Pigs	. .	2,704	

The comparison of prices is as follows:—
Per 8lbs. to sink the offal.

	January, 1845.		January, 1846.	
	s. d.	s. d.	s. d.	s. d.
Beef	. . 2 8	to 4 2	.. 2 6	to 4 4
Mutton	. . 2 10	to 4 4	.. 3 10	to 5 4
Veal	. . 3 8	to 4 10	.. 4 8	to 5 10
Pork	. . 3 0	to 4 6	.. 3 10	to 5 2

Up to Newgate and Leadenhall markets very limited supplies of slaughtered meat have come to hand in the course of the month; while those on offer killed in the metropolis have been by no means large. Prime beef, mutton, veal, and pork, have moved off steadily at full prices. In other kinds of meat very little has been doing at late rates.

Since the above was written we find that Sir R. Peel, in his speech on Tuesday night, proposed to repeal the duties on the following live stock and other articles, viz.:—Calves, goats, kids, lambs, bulls, oxen and cows, poultry, sheep, swine and pigs, bacon, fresh beef, salted do., meat, potatoes, salt pork, fresh do., vegetables, &c., &c.

REVIEW OF THE CORN TRADE DURING THE MONTH OF JANUARY.

The Premier has at length cast aside the mask, and declared that what he once *professed* to be his *principle* can no longer be maintained. Protection to native industry is to be wholly given up, and the doctrines of the Anti-Corn-Law-League are to rule paramount. The question now is, will he be enabled to carry his free-trade measures, and what must be the inevitable consequences should he succeed. From the manner in which his proposals have been received by the house, there is too much reason to fear that, with a few honourable exceptions, the bulk of the whigs, and a large proportion of the mis-called conservatives, will vote with the premier, whilst he is certain of the warmest support the radicals can afford him: we should, therefore, be deceiving our readers if we held out any hope of the existing laws, (or, indeed, protection to any extent worth accepting,) being maintained. Farmers must consequently prepare for the worst, viz., an unrestricted competition with the comparatively untaxed foreign growers of corn. It is almost impossible to foresee the effects this rash experiment must have on the value of landed property, and the ruin it is likely to cause among all classes of agriculturists. And why is this mighty change to be made? Not because the native produce is inadequate in average seasons to supply the inhabitants of the kingdom with a sufficiency of food, or that any difficulty has been experienced in obtaining ample supplies from abroad in adverse years under the present laws, but because a party of wealthy manufacturers have leagued together for interested and selfish purposes, and, by the power of money, gained such a position in the country as to over-awe the ministry. It may be very well for Sir Robert Peel to come down to the house, and assert that he has suddenly acquired a totally new insight into a matter which has been discussed over and over again, but this sudden conversion cannot blind the public. He either was at heart a free-trader when he professed opposite principles, or the fear of Messrs. Cobden and Bright has been the moving cause in effecting the change. The very last time the corn law question was before the house, viz., in June 1845, when Mr. Villiers brought forward a motion for their total repeal, Sir Robert Peel spoke as follows. To show the advantages of the sliding scale in securing steadiness of prices, he said:—

“I must say that during the existence of the law

there has been greater steadiness of price than at any former period. During every week that has passed since September, the price of wheat has hardly varied more than 1s. 9d. a qr. The lowest price during that period was 45s. 2d., and the highest 46s. 11d. It might be said that that was the result of a good harvest. I must deny it. The harvest has been good for wheat, but for barley it has been defective in this country. It is impossible to deny that the harvest for oats and barley for the last two years was deficient. So far, therefore, as oats and barley were concerned, the new corn-law had been exposed to the operation of a bad harvest. But even with regard to barley and oats, there was a very general importation, and the prices were regularly sustained without fluctuation. But, it is said, that the present law holds out expectations which are false. I must say that that statement is totally devoid of foundation. I much doubt whether at any period during the past history of this country there has been a more rapid progress in agricultural improvement than during the last three years. It is impossible to consider the existence of the present corn law as incompatible with the application of capital to land, or with the applicability of science to the improvement of agriculture. These are charges to which the law is not justly liable. It is not incompatible with the extension of commerce or with manufacturing industry, neither is it incompatible with steadiness of price. It appears to me that you cannot take any effectual precaution against fluctuations in the value of an article like that of corn; that you cannot take perfect security against that which you consider one of the main defects of the existing law, namely the uncertainty as to the future harvest. While there are great speculations in corn great quantities of corn will be brought into the markets of this country. I believe that uncertainty as to the production of a future harvest will always exist. There will always be a degree of uncertainty as to whether a good harvest may not diminish the value of corn, and therefore those who hold foreign corn, if they think that the prices of domestic produce will be affected by the goodness or badness of a harvest, will conduct their speculations or transactions accordingly, and in the months of August and September, whether you have a fixed duty or no duty at all, you must expect that, on account of that uncertainty, considerable quantities of corn will be thrown upon the market (*hear*). But it would be wrong to suppose that these quantities of corn are

thrown upon the market at once. They are retained for home consumption, but are not immediately thrown on the home market (*hear, hear*). Taking these facts into consideration, I do not think that the existing corn law is fairly liable to the charges brought against it, or that the predictions made as to its failure have been verified (*hear, hear*). Sir, I am not prepared to accept the propositions of the noble lord, much less to accept those of the hon. gentleman for the repeal of the present corn law. I do not defend that law upon the ground that it is for the special advantage of a particular interest (*hear, hear*). I believe that it would be impossible to maintain any law supposed to be founded on such a consideration as that upon which it is said that this corn law is founded—a desire to increase the rents to the landowners (*cheers from the Opposition*). But this I do believe, that looking to the condition of the agricultural interest generally, and to that of all those who are connected with it—looking to the obligations to which they are subject—I think that any such change in the corn laws as that contemplated by the hon. member, must tell injuriously—first, no doubt upon the proprietor of the soil—but I believe that the main objection to such a proposition would be, that it would tell more injuriously still upon that great class whose prosperity is involved in that of the landowners (*Ministerial cheers*.)” After pointing out other advantages connected with the law of 1842, he concluded his remarks by giving a decided negative to the policy of free trade, thus:—“Now, I do believe that the instantaneous application of any such policy either to the agricultural or colonial interest, though it might be accompanied by a fall of prices, yet would not be to the advantage of this great community (*cheers*). And it is on that ground—believing that such a measure as that proposed would be injurious to every interest—believing that our colonial relations could not co-exist with the sudden application of such a law—believing that the interests of Ireland would be prejudiced by it—thinking that it would be difficult to foresee the consequences of such a sudden import of corn taking place, or whether it would have the effect of giving you security for permanent low prices. I will give my decided vote against the motion of the hon. gentleman (*loud cheers*).”

It may not be pleasant to the minister to see the words uttered six months ago quoted against him; but, we ask, what dependence can be placed in a man who declares emphatically in June that the measure brought forward in 1842 had worked well, and answered all the purposes intended, and comes down to the house scarcely six months afterwards, to inform that assembly that circumstances have so altered his views, that he is not only prepared to support those whom he previously opposed, but is

actually ready to undo that measure which three years before he had, with great parade, brought forward as a final settlement of the question? But it is useless to waste words on the subject; the only plan now is, for the landed interest to endeavour to make the best terms for themselves. The corn laws may be considered as already virtually repealed; but surely the Government will not refuse to make recompense to the farmer, by lightening the burdens under which he labours: at all events, the county members ought to be on the alert, and as clamour and agitation appear to be the only means by which any impression can be made on our expediency-minister, meetings, advocating the repeal of the malt tax, and the reduction of other burdens on land, should be held in all parts of the country.

The turn which affairs were likely to take, has been some time foreseen, and the important fall which has taken place in prices of wheat and other grain, during the last two months, has been wholly caused by the fear of some such measure being proposed as that which the premier submitted to the House of Commons on Tuesday the 27th of January. So great a fall having already occurred, in anticipation (fully 10s. per quarter, on wheat), we do not think any further influence is likely to be produced; indeed the removal of uncertainty will probably give an impetus to trade, and as there is no chance of large foreign arrivals for some months to come, we should not be surprised if the value of corn was for a time to tend upwards. Ultimately, however, the effect of a free trade must be to reduce prices of agricultural produce in Great Britain to the continental level.

The transactions of the month have presented no feature of interest, business having been almost suspended during that period, all parties have been alike unwilling to enter into extensive operations until definitely informed as to the steps the Government intend to take. For a space of nearly two months merchants and millers have, therefore, refrained from buying more than absolutely requisite to supply their immediate wants, and the stocks in their hands have been gradually reduced to so low an ebb as to render it nearly certain that now, when all doubt respecting the corn laws may be said to be at an end, a very active demand must succeed to the recent inactivity. We are, therefore, inclined to think that farmers will yet have an opportunity of disposing of that portion of their crop still on hand, on more advantageous terms than those they have recently been obliged to accept, provided they be not induced by political events to overload the markets.

In taking our usual monthly retrospect of the transactions at Mark Lane, we must in the first instance notice the very great falling off in the

supplies of home-grown wheat. Considering that the position of affairs has been of a nature to alarm rather than to encourage the growers, we are disposed to regard this as a proof that the previous free deliveries had so far reduced the stocks in the hands of the producers as to render them unwilling to go on selling at the materially depreciated prices. The total arrival of English wheat into London from the commencement of the month up to Saturday the 24th instant has consisted of only 13,807 qrs., against which were received in the corresponding period of 1845, 31,165 qrs. The smallness of the supply has, however, failed to cause any improvement in the value of the article; indeed, from week to week prices have given way, owing to the determination of millers to buy only so much as they could immediately, when converted into flour, dispose of. The reduction in wheat since the commencement of the year cannot be estimated at less than 4s. per qr.; and, considering that the fall was quite as great during the month immediately preceding, we are inclined to believe that prices have now touched the lowest point. The very wet weather experienced of late, and the almost total absence of frost, have prevented any improvement taking place in the condition of the new wheat; on the contrary, the samples have come to hand in worse order week after week, a circumstance which has not been without its influence on the trade. Old English wheat seems now to be nearly exhausted, and for some time past little or none has been brought forward; the principal London millers had however, until very lately, some quantity of old foreign on hand, which has enabled them to manufacture the damp parcels of new. Their resources in this respect are now nearly exhausted, and should business become more active (as we anticipate it will), the demand for free foreign wheat must increase in the same proportion as the inquiry for English, a mixture of the two being absolutely requisite to manufacture a good sack of flour. From the cause above referred to, namely, the possession of old wheat by the millers, the transactions in free foreign have been on a strictly retail scale during the month; holders have, nevertheless, remained tolerably firm. The value of the article has certainly given way more or less, but not to the same extent as English wheat; and we doubt whether even the liberation of the bonded will produce much influence, the conviction that all now here will be required before further large arrivals from abroad can take place having been greatly strengthened by the statement delivered by Sir Robert Peel in Parliament respecting the unfortunate failure of the potato crop. The operations in bonded wheat have been even more circumscribed during January than the month immediately preceding. Not the slightest inclination

has been manifested to enter into speculative investments; and, beyond a few trifling purchases of Odessa and Danube wheat for shipment to Belgium, nothing has been done. On the 23rd instant importers withdrew their samples under the impression that the corn laws were to be wholly suspended, and the stocks under lock be declared free. Since then the inquiry had decidedly improved, and, in addition to a sale or two of Polish, Odessa, and Danube wheat, at prices not attainable in the commencement of the month. Several parcels changed hands on Monday the 26th instant at decidedly enhanced rates.

Rarely have the metropolitan millers experienced greater difficulty in inducing the bakers to purchase flour than during the month now about to terminate. The impression that the corn-laws would be entirely repealed became general several weeks ago; and since that period a firm determination has been shown to meet the new order of things with a complete clearance of stock; the London bakers have therefore refused to buy a sack more flour than they were obliged to take to keep their business going; and as a body they may be said to have made a total clearance of their stores. The nominal top price of town-manufactured flour has remained at 56s. per sack; but this has been no guide respecting the real value of the article, secondary marks having been sold at very irregular rates. The lowest price taken for Norfolk households in the river has been 40s. per sack; latterly, however, sellers have refused to accept that rate, 42s. having become the selling price. The importations of foreign flour have not been particularly large, still its value has tended downwards. United States good brands, which were worth 30s. per brl. in bond in December, having been sold at 28s. to 29s., and Canadian free at 35s. per brl.

With barley of home growth the London, as well as most of the principal provincial markets have been well supplied, but comparatively few samples of fine malting quality have appeared. At Mark Lane the best sorts have very nearly supported their previous value, though the demand has been far from active; the present price of choice chevalier is still 38s. to 39s., and at no period has it exceeded 40s. per qr. Secondary and inferior descriptions have, on the other hand, been nearly unsaleable, and have receded at least 1s. to 2s. per qr. during the month in all parts of the kingdom. The arrivals of this grain from abroad have not been large; but the greater part of what has come to hand has been entered for home consumption; and at present there is little in bond to be liberated should Sir Robert Peel's new plan come into immediate operation. The malt trade has been decidedly inactive; but the scarcity of the finer

varieties has prevented these receding in value; and even good samples of brown malt have been held at 54s., whilst the price of pale Ware has not been lower than 64s. per qr.

The extent of the potato disease in Ireland has caused the shipments of oats from that country to be on a much more moderate scale during the last month or two than usual; and the arrivals into London have been extremely small. From our own coast and Scotland the supply has meanwhile been moderate; nor have the receipts from foreign countries been particularly large. The market has consequently become quite bare; and though prices have not generally been quoted much higher, in comparing the present value of the article with what it was at the close of December, it will be seen that the advance has been rather important. Good Irish feed oats were then currently selling at 25s., and other sorts at proportionate rates; whilst now the first-mentioned kind cannot be purchased below 27s., and good feeding qualities from Scotland have lately been held 28s. to 29s. per qr. Should the Irish shippers adhere to the plan they have lately pursued, viz., keep their oats at home to be converted into meal as a substitute for potatoes, prices must unquestionably rise materially here; as there is no prospect of foreign supplies at all adequate to the demand reaching us, the last crop having turned out very indifferently all over the continent of Europe.

Beans have tended downwards in price throughout the month, though the supplies brought forward have not been large; the continued depression in the value of this article has influenced the averages; and the duty, after having long stood at the minimum point, is now 2s. 6d. per qr. From the north of Europe we are not likely to receive supplies of any importance; but from the Mediterranean a good many cargoes are, we believe, on passage to England. The extraordinary mildness of the season has caused peas to be much less extensively consumed this winter than usual; and though the exports to Holland and Belgium in the autumn must have made considerable inroads on the stocks, the supplies hitherto brought forward have proved more than sufficient for the home demand, and prices of white and blue boilers are now about 20s. per qr. lower than they were at the period when the alarm respecting the failure of the potato crop in the Netherlands was at its height. Maple and grey peas have also fallen materially, the former being at present only worth about 36s. per qr. at Mark Lane, and the latter from 32s. to 34s. per qr.

In referring to the foreign grain trade, we shall confine our notice principally to wheat, little or nothing having been done in spring corn at any of

the continental markets on British account. Even in wheat the transactions have been of very trifling importance, owing partly to the season of the year (many of the Baltic ports having for a time been frozen up); but, in a greater degree, to the uncertainty felt as to what would be done in England with the corn-laws. This question has been nearly as anxiously watched by our continental neighbours as by ourselves; and merchants on the other side have manifested very little inclination to enter into contracts for spring shipment whilst the matter remained unsettled.

The latest accounts from Danzig state that the abandonment of protection by the British Government was looked for with so much certainty, that holders of fine old wheat had refused to conclude bargains, to ship the best sorts in spring, below 56s. to 57s. per quarter; and even the produce of last year, weighing only about 60lbs. per bushel, had been held at 48s. to 49s. per quarter, free on board. This certainly shows great firmness in the face of the continued dull accounts from hence, and plainly proves that foreigners are sanguine of driving a profitable trade with us, should our necessities at any time render us greatly dependent on them. It is not in scarce years that prices here will be much affected by giving up the corn laws, hence the benefit the public are informed they will derive from this step is by no means so certain to follow. It is in comparatively abundant seasons, that supplies will be poured into our markets, and when assistance is not wanted we shall be sure to have prices beaten down to a ruinous point.

The advices from the lower Baltic ports are of a similar character to those from Danzig; merchants were patiently waiting the issue of affairs in this country, and were not inclined to enter into business with any degree of precipitation. The limits of the few English orders received had not come up to their expectations, and hardly any contracts had been closed, either at Rostock, Wismar, Stettin, or any of the neighbouring places to ship wheat in spring. The price for good qualities ranged at the port named, at from 48s. to 49s. per quarter, free on board, and an advance was deemed more probable than a decline.

At Hamburg the transactions in wheat appear to have been entirely of a local nature, notwithstanding which the finer descriptions of red wheat, had at no time in January been sold much below 52s. to 53s. per quarter.

In the Dutch and Belgium markets prices have rather tended upwards. It will be recollected by our readers that the export of grain from those countries was prohibited in the autumn, the prohibition extending to next July, whilst the import was permitted free of duty up to the same time.

The latest quotations of Odessa wheat, at Antwerp, were 52s. to 52s. 6d. per qr., which is several shillings higher than the same sorts may be bought at (in bond) in London. Still, there is scarcely sufficient margin for profitable shipments from the latter to the former place.

All over the Mediterranean the value of wheat has for some time been, and still continues, relatively higher than in Great Britain, and though some few cargoes, principally of low quality, were shipped for this country when prices were much higher here, there is no prospect of large supplies from thence, at least for some months to come.

The most recent accounts from Odessa state that the export demand for wheat had fallen off materially; the reduced state of the stock and anticipation of a renewed enquiry had, however, prevented much decline taking place in prices, good qualities being then, still held at 32s. to 33s., and fine at 34s. to 35s. per qr. free on board.

By the steam ship "Acadia," we received advices from the United States and Canada, up to the close of December.

At most of the ports in the States large shipments of flour were still in progress to Great Britain, for which exorbitantly high prices had been paid; and as the freight per barrel to England was then 4s. 6d., a material loss must result from these shipments.

Since the above was in type Sir Robert Peel has announced the details of his plan for altering the corn laws.

He proposes that in three years' time all kinds of foreign grain, pulse, and flour shall be imported at a nominal duty, and that till then the rates chargeable shall vary according to the average price in the following proportion:—

On wheat, when the average price is under 48s. per qr., the duty to be 10s. per qr.
 48s. to 49s. ditto 9s. "
 49s. to 50s. ditto 8s. "
 50s. to 51s. ditto 7s. "
 51s. to 52s. ditto 6s. "
 52s. to 53s. ditto 5s. "
 53s. and upwards 4s. "

On barley, beans, and peas, when the average price is under 26s. per qr., the duty 5s. 0d.
 26s. to 27s. ditto 4s. 6d.
 27s. to 28s. ditto 4s. 0d.
 28s. to 29s. ditto 3s. 6d.
 29s. to 30s. ditto 3s. 0d.
 30s. to 31s. ditto 2s. 6d.
 31s. and upwards 2s. 0d.

On oats, when the average price is under 18s. per qr., the duty to be 4s. 0d. per qr.
 18s. to 19s. ditto 3s. 6d. "
 19s. to 20s. ditto 3s. 0d. "
 20s. to 21s. ditto 2s. 6d. "
 21s. to 22s. ditto 2s. 0d. "
 22s. and upwards 1s. 6d. "

The duties on flour and meal are to have the same proportion to that on wheat as at present.

On all kinds of seeds a uniform duty of 5s. per cwt. is to be levied, and Indian corn is at all times to be admitted at a nominal duty. These are the leading features in his new plan.

The reductions he proposes to make in the burdens on the land, by way of compensation, are of so trifling a character that they cannot have the least influence in substantially recompensing the farmer for what he is called upon to give up. The only redeeming point in the scheme proposed is in our opinion the facilities intended to be given by the Government to encourage draining.

CURRENCY PER IMPERIAL MEASURE

JANUARY 26.			
WHEAT, Essex and Kent, new, red	52	58	White .. 54 63
Old, red.	56	62	Do. 60 64
RYE, old	34	38	New.... 58 40
BARLEY, Grinding, 28 31 Malting	34	—	Chevalier 36 —
Irish	27	28	Bere ... 26 27
MALT, Suffolk and Norfolk	58	63	Brown.. 56 60
Kingston and Ware	60	—	Chevalier 65 —
OATS, Yorksh. & Lincolnshire, feed	22	23	Potato .. 26 —
Yonghall and Cork, black	22	23	Cork, white 23 24
Dublin	23	24	Westport 24 —
Waterford, white	21	23	Black .. 23 24
Newry	25	27	
Galway	21	22	
Scotch, feed	24	25	Potato .. 27 30
Clommel	24	25	Limerick 27 30
Londonderry	25	26	Sligo ... 26 27
BEANS, Tick, new	34	38	Old, small 52 —
PEAS, Grey	36	—	Maple .. 36 —
White	46	48	Boilers.. 50 —
FLOUR, Town-made 55 46 Suffolk 42	— per sk. of 280 lbs.		
Stockton and Norfolk 40 41	Irish 44	46	

FOREIGN GRAIN AND FLOUR IN BOND.

WHEAT, Dantzic	52	56 fine — 60
Hamburg	50	52
Rostock	52	54
BARLEY	23	26
OATS, Brew	24	28
BEANS	44	—
PEAS	50	—
FLOUR, American, per brl.	30	32
		Baltic .. — —

COMPARATIVE PRICES OF GRAIN.

WEEKLY AVERAGES by the Imp. Quarter, from the Gazette, of Friday last, Jan. 23rd, 1846.	AVERAGES from the corresponding Gazette in the last year, Friday, Jan. 24th, 1845.
WHEAT..... s. d.	WHEAT s. d.
BARLEY 31 11	BARLEY 34 7
OATS 22 3	OATS 21 8
RYE 34 9	RYE 31 4
BEANS 36 9	BEANS 35 7
PEAS 39 3	PEAS 35 8

IMPERIAL AVERAGES.

Week ending	Wheat.	Barley.	Oats.	Rye.	Beans.	Peas.
Dec. 13th	59 4	32 9	24 6	36 8	40 8	43 6
20th	57 11	32 7	23 4	34 5	39 6	42 5
27th	55 4	32 5	23 0	32 8	38 6	39 10
Jan. 3rd	55 1	31 11	22 3	33 6	37 9	39 1
10th	56 3	31 10	21 9	33 11	36 8	38 11
17th	56 2	31 11	22 3	34 9	36 9	39 3
Aggregate average of the six weeks which regulates the duty.	56 8	32 3	22 10	34 4	38 4	
Duties payable in London till Wednesday next inclusive, and at the Outports till the arrival of the mail of that day from London ..	16 0	6 0	6 0	8 6	4 6	2 6
Do. on grain from British possessions out of Europe	3 0	0 6	1 6	0 6	0 6	0 6

PRICES OF SEEDS.

JANUARY 26.

It being quite a matter of doubt, whether any alteration is to take place in the duties on Cloverseed and other seeds, the trade was in suspense, holders of bonded not being at all anxious to press sales. Canaryseed was more sought after, and 2s. to 3s. per quarter higher. Quotations of other articles remained nominally unaltered.

SEED, Rape.....	24l.	26l.	Irish ..	—l.	—l.	per last.
Ditto, new	25l.	—l.	per last.			
Linseed, Baltic..	40	44	Odessa	45	47	
Mustard, white ..	10	12	brown	—	—	per bush.
Linseed Cakes, English..	—11l.	10s.	to 12l.	0s.	per 1000	
Linseed, English, sowing	54	60	crushing	45	47	per qr.
Carraway	44	46	new ..	48	50	per cwt.
Coriander	11	14	per cwt.			
Mustard, brown, new...	10	12	white..	9	11	p. bush
Hempseed	35	38	per qr.			
Trefoil	17	24	old..	—	new	—

PRICES OF HOPS.

BOROUGH, MONDAY, JAN. 26.

The demand for Hops has not been of any magnitude, and the supply is moderate. Quotations have been very fairly supported for new samples, viz.:—Sussex pockets, 6l. 10s. to 7l. 2s.; Weald of Kent, do., 6l. 10s. to 7l. 10s.; Mid Kent, do., 7l. 7s. to 9l. 9s.; East Kent, do., 8l. 8s. to 10l. 10s.; Mid Kent, bags, 8l. 5s. to 9l. 5s. per cwt.

POTATO MARKET.

SOUTHWARK, WATERSIDE, Jan. 26.

The supply, since our last report, has been very limited by the sailing vessels; notwithstanding, those left of former arrivals, with the supply by the steamboats and railways, have been fully sufficient for the present limited demand, and the trade is languid at the following prices: York Reds from 80s. to 130s.; do. Regents, 90s. to 120s.; Lincolnshire Kidneys 90s.; Scotch Reds, 50s. to 80s. There were one or two fresh cargoes that arrived at the close of the week, when 85s. to 90s. was asked; but few sales have been effected at the last named prices. Jersey Blues, 75s. to 80s.

WEEKLY PRICES OF POTATOES per ton, in Covent Garden Market, in 1844, 1845, and 1846.

	1844-5.		1845-6.		
November 23	50s. to 50s.		Novemb. 22	70s. to 130s.	
	30	50 75		29	80 140
December 7	50 75		Decemb. 6	80 160	
	14	50 70		13	80 160
	21	50 70		20	80 160
	23	50 70		27	80 160
Jan. 4	50 80		Jan. 3	80 160	
	11	50 80		10	80 160
	18	50 80		17	80 160
	25	50 80		24	80 160

Also at the Waterside, Southwark.

December 2	50s. to 70s.	Decemb. 1	50s. to 120	
	9	50 70	8	50 120
	16	50 70	15	50 120
	23	50 70	22	50 120
	30	55 75	29	50 120
Jan. 6	60 80	Jan 5	59 120	
	13	60 80	12	50 120
	20	60 80	19	50 120

WOOL MARKETS.

BRITISH.

LEEDS, Jan. 23.—The demand for wool this week has been steady, and prices are firm at last week's prices.

WAKEFIELD, Jan. 23.—There is no alteration in the value of wool this week, although sales have hardly been so extensive as last week, from the uncertain state of political matters, and both parties seem waiting the result of last week.

LIVERPOOL, Jan. 24.

SCOTCH.—There has been a moderate business doing in laid Highland Wool at late rates; white Highland is still neglected. There has been a good business done in both cross and Cheviots of a good character and class; inferior of both kinds continue to be neglected.

	s.	d.	s.	d.
Laid Highland Wool, per 24lbs	9	3	to	9 6
White Highland do	12	3		13 0
Laid Crossed do., unwashed ..	11	0		12 6
Do. do., washed	12	0		13 6
Do. Cheviot do., unwashed ..	12	0		14 0
Do. do., washed	14	6		18 0
White Do. do.....	24	0		28 6

FOREIGN.

The market for Wool has been rather dull, in consequence of the important proceedings in Parliament, and no leading staple can be expected to assume its right position until the many auxiliary articles connected with it are placed in a permanent scale of duties. The anxiety among all classes is most intense, and the Corn-law agitation deranges every interest. But for this we should, doubtless, have had an improvement, as other matters are in favour of brisker trade.

Accounts of the 10th inst., from Leipzig, state that the demand for woollen goods had been bad, not above half the quantity offered having found buyers. The average reduction in prices, compared with last year, was 2 rix-dollars per piece. Other woollens were in a similar position, only the newest fabrics being sold. The Grech buyers took more of the English than of the Zollverein goods. In sheep's wool a fair business was done. The Berlin merchants, however, attracted a good many buyers from Leipzig, by offering wool at 15 to 20 rix-dollars decline, whereas the holders of good clips who came to the Leipsic market did not feel disposed to take even 8 or 10 rix-dollars less. Money was scarce.

Advices from Konigsberg state that the Wool fairs of last year did not go off so well as could have been wished, and the growing competition of Australian is felt as injurious to the German staple.

At Pesth, on the 7th inst., there was a good demand for Wool, owing to the large sales of cloth.

In the Breslau market, also, on the 12th inst., there was more doing in Wool.

LEEDS, Jan. 23.—A fair amount of business has been done in Foreign Wools during the past week, and a feeling of greater confidence begins to manifest itself, both amongst manufacturers and dealers. Prices have also in some measure participated in the improvement.

PRICES OF SHARES.

Shares.	Div. last half year	RAILWAYS.	Price per Share.	5,000 16,000	Kendal and Windermere 25l sh 1½ pd Lancaster and Carlisle. 50l sh 30l pd Leeds & Carlisle. 28l 2½ Leicester and Birmingham 20l-h 22s pd Leicester and Bedford. 20l sh 22s pd Leic., Tam., Cov., Bir. & Trnt. Vall. Junc. 20l sh 22s pd Limerick and Waterford 50l sh 42s pd Liverpool & Manchester. 100l sh pd Ditto Half Shares. 50l sh pd Ditto Quarter Shares. 25l sh pd Liverpool & Leed: Direct 50l sh 28l pd Lpool., Manch., and Newcastle Junction 2½ pd London & Birmingham. Stock Ditto Thirds. 32l sh 16l pd Ditto Quarter Shares. 25l sh 2l pd Ditto Fifths. 20l sh 2l pd London and Birmingham Extension 25l sh 1½ pd London & Blackwall. Av. 10l 13s 4d Ditto New. 1½ pd Ditto Extension. 8l pd London and Brighton. 50l sh 7l pd Ditto Consolidated Eighth's 50l sh 40l pd Ditto Fifths. 50l sh 10l pd London & Croydon. Av. 18l 15s 9d Do. Guaranteed 5 per Ct. 9l sh 9l pd Lon., Chelt., Oxf., Glouc., and Hrd., 25l sh 18l pd London & Greenwich. Av. 12l 15s 4d Preference or Privilege. Av. 18l 17s 2d London, Hounslow, & Western. 2l pd London & South West. Av. 4l 6s 1d Ditto Consolidated Eighth's 40l sh 28l pd Ditto New. 50l sh 7l pd Ditto New. 40l sh 6l pd London and York. 50l sh 2½ pd London and Windsor. 25l sh 1l pd London, Warwick, & Kidder. 50l sh 2½ pd London, Salisbury, & Yeovil 50l sh 2½ pd Londonderry & Coleraine, 50l sh 2½ pd Londonderry & Enniskillen 50l sh 2½ pd Lynn and Ely. 25l sh 5l pd Lynn and Dereham. 25l sh 5l pd Manchester & Leeds. 100l sh 82l pd Ditto Half Shares. 50l sh 38l pd Ditto Quarter Shares. 25l sh 2l pd Ditto Fifths. 1l pd Ditto Sixteenth's. 6½ sh 5½ pd Manchester & Birming. 40l sh 40l pd Do. ¼ Shares. 10l sh 4l pd Do. New ¼ Shares. 10l sh 2l pd Do. Continuation and Welsh Junction 1½ pd Manchester, Buxton, and Mallock. 20l sh 42s pd Manchester, Bir., & Mould Junction Manchester to Southampton. 2l pd Midland. Stock Ditto Fifth's. 20l sh 2l pd Ditto New. 40l sh 12l pd Ditto Birmingham & Derby. Stock Midland Grt. West. (Irish) 50l sh 2½ pd Do. Extension to Sligo. 2½ pd Newcastle and Carlisle. 100l sh pd Newcastle, Durham, and Lancashire Junction 1½ pd Newestl & Darling Junc. 25l sh 25l pd Ditto New (Branding). 25l sh 20l pd Newcastle & Berwick. 25l sh 10l pd Newport and Abergavenny. 10l pd New Ross and Carlou. 22s pd Newry and Enniskillen, 50l sh 2½ pd Newark, Sheffield, & Boston 25l sh North British. 25l sh 17½ pd Ditto ¼ Shares. 12½ sh 8½ pd Ditto Carlisle Extension. 12½ sh 14½ pd Ditto Dalkeith. 5l sh pd North Devon. 2l pd Northern & Eastern. 50l sh 50l pd Do. Scrip. 5s dis. 50l sh 40l pd Do. ¼ Shares. 12l 10s sh pd Do. New. 1l pd North Kent & Direct Dover, 50l sh 24l pd North Staffordshire. 20l sh 42s. pd North Wales. 25l sh 3½ pd Norwich and Brandon. 20l sh 18l pd Ditto New. 10l sh 3l pd
		Aberdeen. 5l pd	6 a 5½		
		Amber, Nottingham, Boston, & Drewash Junc. 2½ pd	3½ a ¼		
24,000	2l p sh	Armagh, Coleraine, Portrush 25l sh 18l pd	18l		
4,000		Aylesbury and Thame. 18l pd			
		Belfast and County Down. 2½ pd		5,100	1½ per ct
		Bideford and Tavistock. 18l pd		7,968	1½ per ct
9,500	10s	Birmingham and Gloucester 100l sh pd	130 a 29	11,475	1½ per ct
10,000		Do. New, iss. 7½ dis. 25l sh 17½ pd			
30,000		Birmingham and Oxford Junction, 20l sh 2l pd	3½		
		Boston, Stamford, and Birmingham. 22s pd	3 dis	4125000	5l per ct
9,500		Brighton, Lewes, & Hastings, 50l sh 20l pd	41,250	5l per ct	
15,000	17 8s p sh	Bristol and Exeter. 100l sh 70l pd	84½ a 2	54,450	5l per ct
		Ditto New. 38½ sh 2l pd			
6,640	12s p sh	Bristol and Gloucester. 50l sh 30l pd	55	43,000	3s
		Bristol and Liverpool Junction 2½ pd			
36,000		Caledonian. 50l sh 10l pd	14½ a ¼		
51,000		Ditto New. 25l sh 2l pd	4½ a 3		
		Do. Extension. 50l sh 2½ pd	3½ a ¼		
		Cheltenham and Oxford. 2l pd		36,000	30s p sh
		Chelmsford and Bury. 18l pd		4,500	
		Chester and Holyhead. 50l sh 15l pd	16½		
42,000		Chester and Manchester. 42s pd	½ dis	33,000	3s0d p sh
		Clydesdale Junction. 5l pd		35,000	
		Cork, Blackrock, & Passages 22s sh 22s pd			
40,000		Cork and Killarney. 50l sh 2½ pd			
		Cork and Waterford. 25l sh 1½ pd		43,077	
		Cornwall. 50l sh 5l pd	11,136	10s	
		Derby, Uttoxeter, and Stafford 2½ pd			
		Direct Manchester (Remington's) 20l sh 2½ pd	1½ a 7	46,200	2l 0s p sh
		Do. Do. (Rastrick's) 5½ pd	4		
		Direct Northern. 50l sh 2½ pd	2½ a ¼		
35,000		Direct Norwich. 20l sh 1l pd		90,000	
		Dublin and Armagh. 18l pd		20,000	
21,600		Dublin & Belfast Junction. 50l sh 5l pd	6½		
10,000		Dublin, Belfast, & Coleraine, 50l sh 2½ pd			
12,800		Dublin and Galway. 50l sh 4l pd	3½		
17,000		Dundalk and Enniskillen 50l sh 5l pd			
144,000	3s p sh	Eastern Counties. 25l sh 14 16s pd	22½ a 8	10,000	
		Do. New. 25l sh 6l 16s pd	7½ pm	10,000	
144,000		Do Perpetual, No. 1. 6l 13s 4d sh pd	8 pm	8,000	
144,000		Ditto ditto, No. 2. 6l 13s 4d sh pd	8 pm		
		East Dereham and Norwich. 1l pd		13,000	2l 18s 5p
4,500		Eastern Union. 50l sh 25l pd		13,000	2s 8d p s
2,000		Ditto Quarter Shares. 12½ sh 3½ pd		13,000	
		East Lincolnshire. 1½ pd	2½ a 7		
		East and West of England. 1l pd		22,750	1l p sh
18,000	17 10s p s	Edinburgh & Glasgow. 50l sh 5l pd	75½ a 5	30,000	
		Ditto Half Shares. 5l 15		30,000	
18,000	7s 6d p s	Ditto Quarter Shares. 12½ sh 7½ pd			
26,000		Ditto New ¼ Shares. 12½ sh 7½ pd	13½		
26,000		Edinburgh and Northern, 25l sh 1½ pd			
		Edinburgh and Perth. 3l pd	4½		
10,800		Ely and Huntingdon. 25l sh 5l pd			
		Enniskillen and Sligo. 2½ pd			
		Exeter, Yeovil, & Dorchester, 50l sh 2½ pd	2½ a ½		
		Glouc., Aberystwith, and Central of Wales. 25l sh 1½ pd	1 a 0½	4155400l	3l per ct
		Goole Doncast. & Sheffld., 20l sh 42s pd	2½ pm	12,500	
10,918	5l per ct	Grand Junction. 100l sh pd		978500l	46s 8d p c
10,918	5l per ct	Ditto Half Shares. 50l sh pd		15,000	
8,000		Ditto Quarter Shares. 25l sh pd			
		Grand Union (Nottingham & Lynn) 1½ pd	1½ a 3		
		Great Leinster & Munster 100l sh 7½ pd			
		Great Eastern and Western. 2½ pd	1½		
12,000		Great Grimsby & Sheffield, 50l sh 5l pd		20,000	19s 6d p s
20,000		Great Southern & Western (Ireland) 50l sh 15l pd	21½ a 2		
		Ditto Extension. 50l sh 12½ pd			
		Great Munster. 2½ pd			
10,000	3l p sh	Great North of England. 100l sh pd	217½ a 18½		
	10s p sh	Ditto New. 40l sh 5l pd	51½ a 50½	21,000	
		Ditto New. 30l sh 5l pd	36		
		Great North of Scotland. 2½ pd		36,000	
25,000	4l per ct	Great Western. 100l sh 85l pd	161 a 3		
25,000	4l per ct	Ditto Half Shares. 50l sh pd			
		Ditto Quarter Shares. 5l pd	19 a 20		
37,500	1l per ct	Ditto Fifths. 20l sh 20l pd	56 a 7		
		Guilford, Farnham, and Portsmouth, 50l sh 5l pd	5½ a ½	0,256	17 10s
20,000		Harwich. 20l sh 1l pd		3,136	22s 6d
8,000	17 15s p s	Hull and Selby. 50l sh pd		12,208	7s 6d
8,000	8s 0d p sh	Do. Quarter Shares. 12½ sh pd			
		Do. Half Shares. 25l sh 7l pd	27 a 6	12,000	
15,000		Inverness and Elgin. 20l sh 2l pd		19,000	
50,000		Irish North Midland. 1½ pd			
		Isle of Axholme. 28l pd			

1851
1852



John Trudy
Monteur.

THE FARMER'S MAGAZINE.

MARCH, 1846.

No. 3.—VOL. XIII.]

[SECOND SERIES.

PLATE I.

PORTRAIT OF COLONEL LE COUTEUR.

ENGRAVED BY J. B. HUNT, FROM A PAINTING BY J. BERTEAN.

PLATE II.

THE BARON; WINNER OF THE ST. LEGER, 1845.

ENGRAVED BY E. HACKER, FROM A PAINTING BY J. F. HERRING, SEN.

(For description see page 208.)

COLONEL LE COUTEUR.

AUTHOR OF "ESSAY ON WHEAT, &C.

So much real and rational amusement accompanies the study and practice of agriculture as to cause one frequently to hesitate whether to rank it as a pleasure or a profession. Classing it however, more legitimately amongst the latter, we have every confidence in affirming that there is no pursuit to be engaged on with less *forced* application, or continued with more spontaneous attractions. The business of the farm, indeed, as we may everywhere alight upon examples, is commonly had recourse to by the best and most prominent men as a positive relief to more onerous, though scarcely more intellectual labours. They turn to it as an accredited means by which bodily health and mental vigour may be equally increased; and happily the direction of the most refined taste and highest ability towards rural affairs has seldom been without a reciprocal advantage. Fairly and only properly considered, there are few themes would afford more food for reflection, more scope for innate talent, or a better employment for an enterprising spirit than agriculture; while none could enlist these properties with a greater or more direct tendency towards the common good. It

may, perhaps, be argued, that when men, however great their worth, merely affect a particular science or occupation as a change or resting time to other duties for which they have more especially and attentively prepared themselves, no striking improvement is likely to be the result of their holiday thoughts and acts. In other words, that gentlemen who occasionally "play at farming," though they may do themselves little harm, are not the most promising people to choose for doing the whole body of working farmers any good. In opposition to this, it must be remembered that few good or great minds are apt to trifle with any subject they may judge worthy of attending to at all, and that no calling (as we have said) is more engaging in its nature, when only once commenced, than that of the farmer. Again, let it be impressed, that experiments in agriculture—the leading feature of course in our progress—require, to be tested with any effect, an amount of attention and capital which the tenant would, in these days, be very seldom able to allow; even supposing him to possess the genius and spirit for attempting them. Our great hopes, then, must be in gentle-

men, who, with educated tastes and generous motives, have the means to support the principles and the completion of those studies on which they have so honourably, so disinterestedly, and so usefully employed themselves. This we take as our standard of an EMINENT BRITISH FARMER, an high and enviable character, that either in purity of purpose, perseverance in action, or excellence in exposition, we beg leave to introduce Colonel Le Couteur as having fairly fought for and as deservedly earned.

The efforts of Colonel Le Couteur to advance the cause of agriculture, though scarcely ever ceasing when once he had turned his attention to it, are yet comparatively of but recent date. The scenes in which his early life was passed, and indeed his own address and success on appearing in them, gave little promise of his ever obtaining any eminence in that sphere of which it now becomes our pleasing duty to speak of him. He is, in fact, one of those we have alluded to, as taking to the business of the farm, in the first place, chiefly by way of filling up a vacuum, that to a naturally active disposition is altogether unbearable. From his very birth, his ideas would seem to have had essentially a military turn; the eldest son of one who had well served his country as a soldier—the late General Le Couteur, of Belle Vue, Jersey—everything determined him on becoming one himself, and with that view was his education entirely regulated. He accordingly in due time, arrived at the Military College, Marlow (since removed to Sandhurst), where he quickly gave evidence of an ability and industry that has invariably characterised every act his disposition or his duty has induced him to undertake. During his residence at the University, we find amongst other good features, that he held the appointment of Senior Under Officer, and at length finished off a highly creditable course of study, by obtaining that crowning point with the young soldier—his commission—by public examination.

From this period, the life of Colonel Le Couteur as a soldier amply fulfilled that his college progress had given so good cause to expect. During the whole of the war in Canada he was, we may in good truth venture to say, on *active* service; affording the right division his assistance as adjutant at one time, then seeking a reputation at the cannon's mouth as acting engineer, and at another season scouring the country to find food for the men as commissary, by way of change to the "food for powder" employment he had originally commenced with. In the dangers, moreover, as well as honours of these appointments, he had undoubtedly his full share; being, through the fortune of war, blown up by the springing of a mine in the storm-

ing of Fort Erse, and playing a good part, though with less imminent peril, at the battles of Niagara, Sackett's Harbour, and many other minor engagements. The next office we trace Captain Le Couteur as filling, after this, was military secretary to his father's staff in the West Indies—the last, we believe, he ever engaged in, as his own regiment, the 104th, was subsequently disbanded, and the captain with his brother officers placed on half-pay.

Captain Le Couteur now returned to and settled in his own native island, Jersey; but intent on anything but passing his time in that idleness of glory to which some—though certainly not the majority—of our heroes are and have been occasionally prone. A simple enumeration of the honourable distinctions his worth, services, and talents, have obtained for him here must be all we can find space for previous to touching on that part of the gallant gentleman's life which more particularly relates to our own object. He soon, then, became a leading member of the Legislative Assembly, afterwards a Jurat of the Royal Court, a Colonel in the 1st Regiment of Royal Jersey Militia, permanent High Sheriff of Jersey, and, lastly, an Aide-de-Camp to his late Majesty, William the Fourth.* Strong and gratifying proofs of Colonel Le Couteur's efficiency as a soldier and a civilian that require no comment, but which his equally good services as an agriculturist must, we flatter ourselves, tend in no small degree to support.

In our biographical notice of the last portrait in this series published—that of Mr. Jaques, of Easby Abbey—we had good occasion to dwell on the advantages arising from gentlemen not merely putting down their names and their subscriptions to agricultural associations, but more especially from any active personal assistance they may have it in their power to offer. What we then said of Mr. Jaques's able services on this point we might very fairly repeat now in estimating those of Colonel Le Couteur, for they have in their object and effect on such societies been materially similar. In 1832, the Colonel having at that period fully entered on agrarian pursuits, or, in the words he quotes in his very excellent work on wheat, "turned his sword into a ploughshare," founded—in conjunction with a few other gentlemen—the Jersey Agricultural and Horticultural Society, of which he was originally, and still continues to be, honorary and acting secretary. The value of a club of this description, in a locality comparatively isolated, must be even greater than if its members were surrounded by plough and pasture instead of salt

* Colonel Le Couteur is also a fellow of the Royal Society, and a Member of the Society of Arts.

water; through it they may obtain every improvement either England or France has suggested; and by its agency, as has been very well proved, may bring out to the best advantage that produce in which their own small territory has been found to excel. This has been more particularly the case with the fine seed wheat and the deservedly celebrated Jersey breed of cows, which have, since the formation of the agricultural society, engaged a notice and commanded a market they had never previously been prepared for.

For the fame of the wheat samples, as we shall presently show, the island has almost, if not entirely, to thank Colonel Le Couteur; while his associates would, we have little doubt, be as ready to allow the greatness of his exertions in all matters connected with the advancement of the Jersey Agricultural Association, as we can in that of agriculture more generally.

In at once doing our part, that is, in proclaiming the labours of Colonel Le Couteur for farming and farmers throughout the United Kingdom, we have to commence with one he was engaged in that worked on to an unprofitable issue, chiefly, if not rather entirely, from the Colonel's advice having been neglected. We allude to the formation of The Central Agricultural Society, which he greatly assisted in getting up, and to which he was at once very properly and fitly elected the Honorary Foreign Secretary. So far, and all went well enough: a rule, however, proposed by him—and a GOLDEN RULE for all public bodies established on the same principle—was rejected by his brother members, and the breaking up of The Central Agricultural Society was, as he foretold, the very natural consequence. The purport of this rule was the entire exclusion of political subjects from all discussions and deliberations of the society; an important item that has been ever treated by the present and well established Royal Agricultural Society of England with that strict observance its innate worth demands. Of this society, Colonel Le Couteur is also a member, having been elected a Life-Governor shortly after its formation. His claims to participate in the management of any national undertaking of this character, we think we have already made sufficiently clear, although it is still with the "Essay on Wheat" that the name and fame of Le Couteur will be more generally associated; a work of itself that would have well justified us in ranking its author amongst the most eminent British Farmers; and, as we hesitate not to repeat, what we said on its first appearance, one that cannot be too highly praised. For this, though, we would be understood as taking no particular credit to ourselves, the book having been everywhere received with equally high expressions in its favour, as well as gaining for

its author many direct honors from public bodies. Amongst others a silver medal from the Highland and Agricultural Society of Scotland; a prize of twenty guineas from the Central Agricultural Society of Great Britain and Ireland; a grand silver medal of honour from L' Academie de l' Industrie Agricole, Manufacturiere et Commerciale, at Paris; an election as honorary member of the Agricultural and Horticultural Societies of Avanches and of Nantes; and a resolution expressing the excellency of his work from the Royal Agricultural Society of England. Having thus brought substantial proof of the estimation in which Colonel Le Couteur's literary labours have been and are held by those supposed to be the best qualified to judge, we shall avail ourselves of so appropriate an occasion to offer a word or two on their nature and effect.

The grand points considered and advocated in the essay are the advantages of having as clean as possible a sample of seed wheat, and the policy of adopting various kinds of wheats to various soils and climates. On either of these heads it is not too much to say, that if, indeed, Colonel Le Couteur's observations and experiments have not the recommendation of absolute novelty, they are treated at a length, and with a force never previously employed on them. They involve, in fact, a branch in agricultural knowledge too long unattended to—at least with that care and ability the importance of the subject merited—and fortunately the opening thus afforded, was in time occupied by one whose indomitable energy, and thorough fitness for mastering his theme, has left us nothing to wish for beyond further contributions from the same hand. It is well known that some of our greatest discoveries and most useful improvements in every walk of art and science, have, in the first place, arisen from something like mere accident—a sudden light striking on a strong mind, that has turned it to a train of thought as attractive in its progress, as unsolicited in its origin. That this was the case with Colonel Le Couteur and his studies will be shown by the anecdote we quote: a short passage in the introduction to the work that also well explains the nature of the after thought to which it gave birth. "Five years since, I accidentally saw, with astonishment and pleasure, about eighty distinct sorts of wheat growing in a nursery garden in Jersey; some seven feet high, some only four, the ears of some three inches long, others six. Professor La Gasca, whose they were, happened to join me, and though a stranger, he politely explained their nature to me. I requested him to visit my crops the following day; I considered them as pure, at least as unmixed, as those of my neighbours, when to my dismay, he drew from one field three-and-twenty sorts

—some white wheat, some red, some liver-coloured, some spring wheat; some dead ripe, the corn shaking out, some ripe, some half so, some in a milky state, and some green. I reflected on the subject, and immediately became convinced that no crop in that state, could either produce the greatest weight of corn, give the largest quantity of flour, or make the best or lightest bread, such as would be produced from a field in an equal and perfect state of ripeness." And upon these weighty considerations, based on no mere fastidiousness or affectation of "neat and pretty farming," but interesting alike, in all it contained, to grower and consumer, Colonel Le Couteur, after five years' close application gave to the world a work no less excellent in its aim than great in its success.

Any attempt to follow the Colonel through his practice, in that the professor only preached, would be as unfair, as empty a compliment to a volume already admirably concise and explicit; and we shall consequently only advise such of our readers as have not yet perused it to lose no time in so doing. In addition to the two particular subjects we have named as having engaged the author's attention, every possible item in preparing the land, sowing and reaping the crop, with all the different modes, their advantages and disadvantages considered in comparison one with the other, are quite as fully and ably discussed. From this part we shall, in conclusion, endeavour to find room for one more extract, as touching on an error which many tenant-farmers, from woefully mistaken notions of economy, are too apt to commit. "It has fre-

quently puzzled me much to imagine upon what principles some writers have recommended for seed, a sort of inferior grain, the refuse of a crop, after all the best had been sent to the market. How a principle so entirely contrary to the whole economy of nature, which usually produces the finest progeny from the healthiest and most robust parents, the same being improved or weakened in proportion to proper or improper nurture and culture, could for a moment obtain, it is difficult to conceive; but it was merely argued, that because a large quantity of sickly seed was sown, and that a portion of it grew, and produced a fair crop, it might be considered safe practice." We here leave this, as the writer does, an open question—whether it is better or cheaper to use good corn for seed, or rather that which is good for nothing else? Common sense would seem to coincide with the Colonel, while sage experience may lean to t'other side.

In taking our leave of the Colonel himself at the same time, we cannot but congratulate ourselves and the interest we represent in adding in every respect so excellent and distinguished a man to our Portrait Gallery. As a soldier and a civilian there are many far abler than ourselves prepared to speak as to the service done the state by Colonel Le Couteur; while as an agriculturist we know no one whose acts would afford a better example to the opinion expressed in the opening pages of his own work—"That it becomes us all to work for the common good, and endeavour to assist the farmer in such a way as may tend to extricate him from his difficulties."

ON THE CULTIVATION OF THE BEAN.

In the February number a letter appears from "A Member of the North Walsham Farmers' Club," requesting some information on particular points of bean culture; and as the proper period for sowing that crop is now at hand, it is hoped the following observations on the subject may not be uninteresting to him, and other readers of the *Farmer's Magazine*. The writer may be allowed to state that he has had no inconsiderable experience in bean culture.

The soils best adapted to the growth of the bean are found to be those which are best suited to the production of wheat, viz.—rich clays and strong loams; but in order to obtain an abundant crop of this valuable and highly nutritive legume, it is absolutely necessary that the land be relieved from the injurious influence of redundant moisture, by means of thorough draining. The bean requires

to be sown early in spring, and it would obviously be impracticable to prepare wet adhesive soils in a proper manner for the reception of the seed at that period of the season. Hence the necessity of draining.

The proper place for beans in the rotation is between two corn or white crops; and accordingly in the best bean-growing districts they are made to succeed oats, and to precede wheat, which is evidently the most judicious practice. The bean is commonly regarded as a meliorating or *restorative* crop—an appellation which is not, however, strictly correct, inasmuch as all plants cultivated for, and allowed to mature their seeds, must, in a greater or less degree, exhaust the soil of some of its constituents. Nevertheless, when this legume is cultivated, as it ought invariably to be, in rows or drills, which, from their distance apart, admit of a

considerable amount of tillage being given to the soil during the summer months, it is justly esteemed as one of our best fallow or cleansing crops, and as peculiarly fitted to prepare stiff adhesive land for wheat. Indeed, the value of the bean as a field plant depends in no small degree on this circumstance. The tall stems and large foliage also afford a shade to the ground from the influence of the summer's sun, which is allowed to be of some advantage.

The land intended for beans should be ploughed as early in autumn as the necessary operations of the harvest and the sowing of wheat will allow, and in all cases with as deep a furrow as the strength of a pair of stout horses can accomplish. The early ploughing of the stubble is of the utmost importance, more especially on strong clays, as a means of meliorating the soil by the action of the weather, and the influence of frost during the winter, and thereby greatly facilitating its due pulverization in spring. The bean being a perpendicular-rooted plant, extends its roots and fibres to a considerable depth beneath the surface in search of its requisite nourishment; hence the great utility of deep ploughing, in furnishing a sufficiency of loose soil for that purpose.

The amount of, and mode of executing, the preparatory tillage in spring depend in some degree on the nature and condition of the soil. The preparation of light or of well-drained land is attended with comparatively little difficulty, especially should favourable weather opportunely occur at the time. In this case the preparatory tillage may consist of one or two ploughings given in a contrary direction to the last, and the requisite harrowing to reduce the ground, and disengage and expose all root-weeds; but as the great object is to pulverize the soil to a certain degree of *tillth*, and to eradicate as many of the roots of couch-grass (*Triticum repens*) and of other vivaceous weeds as possible, the ploughing, harrowing, and weed-gathering (especially the two latter operations) must be persevered in, when time and the weather permit, till those desirable objects be attained. The grubber may also be occasionally used, and with advantage.

But even on the lighter classes of soils the foregoing operations are not easily executed in an efficient manner during a continuance of unpropitious weather, which so frequently occurs at that period; while on the undrained retentive lands, on which the bean crop is most commonly grown, such a course of tillage is, for obvious reasons, often altogether impracticable. On strong clays, therefore, it is not an unusual practice in the best bean-growing districts to form the drills or ridglets immediately on the winter-furrow, without bestowing any other tillage upon the land than a

good harrowing to level the surface; but this, too, is not unfrequently omitted.

It has been found a useful practice to give strong tenacious land, intended for beans, a course of tillage in autumn, or at any convenient period before the severity of the winter sets in. In this case the ground, after being ploughed and sufficiently harrowed, is formed into drills in the usual manner, in which state it remains till the period of sowing arrives. At seed time the drills receive a light harrowing to break the surface and destroy any weeds that may be springing up; after which the plough is passed along the intervals, to raise the earth thus levelled down. The manure is then laid in the hollows between the drills, the seed is deposited by the sowing-machine, and both are covered in by reversing or splitting the drills with the plough. The advantages attending the autumn tillage of stiff clays for the bean crop are, that the soil is thereby finely pulverized by the frequent alternations of frost and thaw during winter, the larvæ of insects and many of the roots of perennial weeds are destroyed by exposure to the weather, and the ground, by being formed into raised drills, is preserved in a comparatively dry condition. Another advantage is, that the seed can be sown in proper season.

The manure to be applied to this crop is sometimes spread upon the stubble, and ploughed under when giving the first or winter furrow. This practice, it may be observed, possesses a double advantage: farm-yard dung, not too well decomposed, tends to keep the soil open, so as to allow the admission of the atmosphere; and this part of the process being accomplished during the leisure of autumn or early winter, materially expedites the work in spring. It is also a useful and convenient practice to apply one-half the allowance of manure in autumn in the manner just adverted to, and the other portion at seed-time.

The bean requires a considerable length of time to mature its seeds, and should therefore be sown as early in spring as may be found practicable. The usual season for sowing this crop is from the last week in February to the middle of March. When beans are sown earlier than the former period, and the ensuing summer happens to be more than usually dry and warm, the grain is found to ripen rather prematurely, and the straw or haulm to be both deficient in quantity and of inferior quality; while, on the other hand, if sown later than the middle or the end of March, and the season turn out more humid and ungenial than in ordinary years, the crop is late in becoming ripe, the haulm is likely to be over succulent and luxuriant, and the harvesting is, in consequence, exceedingly difficult and precarious.

The quantity of seed will depend, in some degree, on the condition of the land, the mode of culture adopted, and the particular variety of beans. In Scotland, from four to five bushels are usually allowed to the acre sown, as beans there invariably are in drills or rows twenty-six or twenty-seven inches apart; but in England, where the climate is more favourable to the ripening of this crop, the quantity of seed may be considerably less. From two-and-a-half to three bushels, with a small admixture of peas, I should consider amply sufficient for an imperial acre. And here I may remark that it is undoubtedly a useful practice to sow a small quantity of peas or vetches along with beans, in the proportion of one bushel of the former to six of the latter, *i. e.*, about half a bushel to the acre. The value of the straw, as an article of food for horses, is thereby considerably enhanced, and the pea-haulm may be employed at harvest for the purpose of binding the crop.

The bean is sown in a variety of ways. In some localities the seed is generally sown broadcast, and in others it is dibbled; but the most approved practice is to deposit it in drills at regular intervals. The broadcast system is now universally condemned by intelligent agriculturists, and the practice of dibbling, though confessedly both economical and judicious on a small scale, or in garden culture, as it effects a considerable saving of seed, is far too operose and expensive to be profitably adopted when the bean is grown to any extent as a general crop.

Field beans should, in my opinion, be invariably sown in drills or ridgelets, because, when this mode of culture is adopted, weeds are destroyed with facility by the joint operations of the horse and hand-hoes, and an opportunity is afforded for the tillage of the soil between the rows during the growth of the crop, which is an important consideration when wheat is to succeed. It is a manifest error, but one which is frequently committed, to form the drills for beans too close to each other. It is well known that a certain quantity of air is absolutely essential to the perfect development of plants, and that a free uninterrupted circulation between the rows is requisite to bring the grain to maturity. On good land, under a proper system of cultivation, a heavy crop of beans is generally produced; and when such is expected the drills certainly should not be less than twenty-seven inches apart, otherwise the free admission of the atmosphere between the plants cannot be secured. Intervals of twenty-six inches may, perhaps, be sufficient where a heavy crop is not anticipated; but it must be remembered that when the distance of the rows asunder is less than twenty-six or twenty-seven inches, the benefit to be derived from

the action of the horse-hoe in the after culture of the crop is more or less diminished. The seed is usually deposited in contact with the manure previously distributed along the hollows of the drills by a machine which sows three equi-distant rows simultaneously; but when a sowing machine is not at command, the seeds can be scattered with sufficient regularity by the hand, care being taken to place them in a right line along the top of the dung. Field beans should be, and indeed most generally are, grown in single rows; double rows are practicable only when the dibble is employed.

In some districts in Scotland, beans are sown in rows by depositing the seed in the bottom of every third furrow when ploughing the land. Where this practice is adopted, the dung is either ploughed down with the winter-furrow, or spread upon the surface of the prepared ground at seed-time. Three ploughs are started in succession, and a small bean-drill-barrow is attached to, or follows close upon, the third plough, by which means the seed is dropt in every third furrow, and in due time the young plants come up in parallel rows, from twenty-four to twenty-seven inches asunder, according as the breadth of the furrow-slices may vary from eight to nine inches, the latter being the usual standard. This method of drilling beans is expeditious, and has been advantageously practised in many cases; but it is by no means so favourable to the after-tillage of the ground as when the plants are grown in raised drills, formed in the same manner as for turnips or potatoes.

Having thus briefly adverted to the principal particulars connected with the preparation of the land for, and the sowing of, the bean, it may not be improper to add a few observations on the after-culture of the plant. The first operation bestowed on the bean crop after sowing is a good harrowing, given just as the young plants are protruding through the surface, which has the effect of almost levelling the drills, and of destroying any annual weeds that may be springing up. Either the grass-seed or the common harrow may be used for this purpose; but the curved drill-harrow, employed in certain localities to perform a similar operation in the after-culture of the potato, is to be preferred. This implement, it may be proper to observe, consists of two light curved harrows, adapted to the rotundity of the drills, and is drawn by one horse. The two parts are connected together, and each is furnished with a handle, by means of which the workman keeps the instrument fairly on the drills, and disengages it when impeded by large clods, weeds, or other obstructions. The subsequent culture required by the crop consists of re-

peated horse-hoings, hand-hoings, and hand-weedings. The implements usually employed as horse-hoes are a common plough of small dimensions drawn by one horse, and drill-grubbers of different constructions, designed for under-cutting and dragging up weeds, and for pulverizing the soil between the rows of plants. With the small plough, a portion of the soil is first pared away from both sides of each drill: the grubber then follows to reduce and level the earth thus turned up, and to sever and bring up all kinds of weeds to the surface. The paring-plough may, however, be altogether dispensed with where the improved drill-grubbers or horse-hoes are used, as the latter are adapted to accomplish the work in a manner equally efficient and much more expeditious.

Immediately after the operation of horse-hoeing,

the hand-hoers (women and young persons) are set to work, in order to cut up any weeds that may have escaped the action of the grubber. These operations are to be repeated at intervals during the summer months, with the view of thoroughly cleansing and pulverizing the soil between the rows of plants. After the different hoeing and weeding processes have been concluded, it is customary to raise a portion of the loosened earth up to the stems of the plants, as is done in potato culture. Where the soil is undrained, and of a retentive or adhesive character, this earthing up undoubtedly tends to facilitate the escape of surface-water, and in this case is therefore beneficial; but on light or well-drained land this part of the after-culture is certainly not indispensable.

T. S.

Feb. 9, 1846.

EFFECTUAL AND ECONOMIC DRAINING.

The attention which has lately been paid to draining, and the many schemes devised to effect this object, fully establish its importance. Out of the many plans recommended, each making greater pretensions to cheapness in one form or other than its predecessor, there are few that do not incur considerable cost, both upon the landlord and tenant. Draining with tiles, constructed for the purpose is the present mode. The instruments for the manufacture of these tiles are endless.

Unfortunately, however, it happens that where these instruments can be used at least cost, there is a much cheaper and much better drainage to be effected without any such expensive assistance.

Although the word "unfortunate" is used in the last paragraph, it is only applied as to the ingenious manufacturers of the machines; in other respects it is fortunate, particularly for the farmer, as the following observations will show.

At present the owner of the soil most generally finds tiles within three miles of the farm to be drained, or covenants to bring them within three or five miles of the farm; the tenant is left to draw them the remaining distance at his own cost. The tenant has also to pay all the labour of digging out the earth to an agreed depth and width, and at stated distances; placing the tiles properly, and returning the earth. The present plan will supersede much of this expense, be more effectual, less likely to choke, take off the water quicker, and, if the landlord will only be at the same expense towards draining that he is at for the tiles, the farmer will be at very little cost. This will enable the tenant to drain a larger proportion of his land at

one time; thus rendering his crops larger and the land more valuable in a much shorter period than by any other means. The landlord, too, will be doubly benefited; first, by his land being rendered much more speedily of greater value, and his tenants more prosperous; next, but not a very trifling consideration, instead of immediately having to dip into his pocket for the tiles, he may allow the expenditure to the farmer out of the rent in anticipation. Should the farmer, as is frequently the case, have to take the cost of draining entirely upon himself, then is the saving effected by doing without tiles of paramount importance. Many instances might be recorded where the farmers would not drain even where found tiles; because, in addition to having the tiles free of cost, they required them to be delivered carriage free in the field upon which the work was contemplated. Others would willingly incur all other expenses could they induce their landlords to give the tiles within a reasonable distance.

The plan recommended is not from the pen of a theorist, whose farm is his desk, his crop the result of his pen, and who never had an acre under his care; but one who has had great practical experience, with more than ordinary scope for observation. The efficiency of the plan may be relied on with confidence by the less practical; the others will at once be convinced that all those who are about to commence draining may save themselves the expense of the carriage of the tiles, and have their water courses more free, their land dry sooner, and be equally, if not more lasting, and less likely to get out of order than the tiles themselves.

For clay lands only is this plan applicable. For ploughed lands, take off the surface soil fully the depth that it has been ploughed, the width of an ordinary garden spade, across the field in the direction the drains are to run. Let this first mould be laid at a convenient distance along the side of the trench, that it may not be covered by the clay, which latter is to be taken out at least two feet deep, and of the above width. Having made the ditch of the above width and depth, the bottom of the ditch will be at least seven inches wide. Now take a navigator's scoop, that will measure three and a half inches from edge to edge, taking straight across the front or hollow side. With this instrument commence digging another ditch in the centre of the bottom of the former. Let this be from four to six inches deep. This narrow ditch being in the centre of the broader ditch, there will be left a shoulder of one and three quarter inches at each side of the top of the narrow ditch. Some of the clay that has previously been taken out will be sufficiently long to cover over this narrow ditch, resting well upon these shoulders.

After the first few scoops have been taken out of the lower ditch, allowing room to continue to work, the covering in should commence with one layer of the clay as described; so that the man in digging this lower trench may throw his clay, as he takes it out, upon the top of his last work, thereby saving the loss of time and waste of labour that would be required in lifting this clay three feet out of a hole to throw it in again afterwards. As soon as there are six inches of clay thrown back, let that which lies over the shoulders be first well rammed; then the middle over the hole or drain may be moderately rammed. Now throw in six more inches of clay, and ram well over; then throw in the soil that was originally the ploughed soil, and that was laid away from the clay for the purpose; you may fill in to within six inches of the top, and ram again.

It will be perceived that the two shoulders, each one being one inch and three quarters, forms a solid equal to the width of the opening left, the latter also measuring three and a half inches. To every one it must be evident that with clay, where properly constructed and rammed, such a drain must last to the end of time. But, allow that it only lasts a few years, what is the cost compared to other plans? The mere advantage of only having to clear the top earth, instead of the whole drain, would be worth some attention. The top or wide drain in most instances need not be more than two feet six inches even where the subsoil and other instruments are used. In some cases where the narrow drain is cut six inches deep, it is better to beat the shoulders with the rammer till they almost

meet at the top of the drain; this, however, is rare.

Where grass lands are submitted to this effectual and economic plan, the best method is to take the turf off about four inches deep, at all events to the clay if within this depth, with a plough constructed for the purpose. This turf should be laid with the grass downwards over the narrow drain, in many instances as the first covering, particularly if not a tenacious soil, for this draining will do for grass on almost any description of land.

One of the greatest advantages of draining is, that it renders the earth lighter to work, from its becoming more friable. This is accomplished by the laws of gravity; water always persevering to find its level. This is the reason for having the drain left open for the depth of six inches, as it allows of greater capillary attraction and more opportunity for the water to acquire more feeders to the larger stream. Another advantage of these drains is, that when the water once reaches them, it has no impediment; this quick transit soon enlarges the capillary vessels, and does not choke up their vents. The tile is impervious, or almost so. The water does not run through, but over or along it: even when pierced with holes for letting the water in, so little use had they that the manufacture of pierced tiles has ceased.

Where grass lands are drained, heavy iron-toothed harrows ought to be passed over them several times prior to the drains being cut: this is to tear out as much of the old coarse grasses as possible, more particularly those which belong to a wet undrained soil. No sooner is the draining and filling in completed than the field should be sown over with the best kinds of grass for dry soils; then let the land be well rolled. The reason for harrowing before the draining is, that the field being smoother, the harrows work easier, and some rolling is saved. This harrowing and seeding will save much time, for the water-grasses, as they are termed, take a long while to die out if left to themselves, although they will not grow upon drained land sufficiently well to make a crop. It is for this reason that undrained land will have very heavy crops of coarse hay in wet weather, and but little in dry. When you have drained your land, you have brought dry weather to it, or at least taken off the superabundant wet, which has been the originator of these grasses. This has occasioned draining to get into disrepute with some. A few days since, a farmer said he drained some meadows three years ago, and he had not had a crop since. There had not been time for the grasses to change, and he had done nothing to assist in hastening his work to perfection. It is something like ploughing a field, and leaving it to chance to lay it down, then won-

dering it does not produce hay so quickly or of so good quality as his neighbour, who took pains to produce the best.

The advantages of getting rid of these water grasses immediately after draining is evident. But why drain, if it reduces the quantity? Draining will not reduce the quantity if properly carried out, but increase it, and, instead of yielding only a large crop in wet seasons, will yield an equally good crop in all of upland meadow, each separate load of which will fetch nearly as much as two of the other. The improved grasses will cost less in making, from taking a shorter time to dry on account of its being less sappy, also from not being cumbered with weeds, that fire in the rick unless well dried. The grass is also more fattening, so is the hay,

beyond calculation. The drained land will also carry cattle without pouching. These are the farmer's sheet-anchor; he cannot manure his land so cheaply by any other means, nor can he keep up the best quality of grass without their assistance. All those who drain must understand that the mere making of the watercourses is not the sole object and aim of draining, though it is a great good and the chief part. The grass must be harrowed and rolled as described, then dunged and brush harrowed. When there is time, another rolling will often do good. Never omit the seeding and dunging the same year, and you will be paid for the draining the first season.

PRACTICE.

YOXFORD FARMERS' CLUB.

EIGHTH REPORT.

PRESENTED TO THE ANNUAL MEETING, HELD AT THE TUNS INN, YOXFORD, NOV. 10TH, 1845.

"The advantages or otherwise likely to result from the extension of allotting land to agricultural labourers" opened the business of the club for the present year, the members present adopting the following resolution as conveying their unanimous opinion:—

"That the extension of allotments to labourers is a highly desirable object, tending, as it is conceived it does, to promote habits of industry in themselves and families; at the same time, firmly believing that the quantity of land appropriated to their husbandry individually should not exceed a quarter of an acre, for which they should pay at the same rate which similar land lets for in the immediate neighbourhood. For, cordially as they feel bound to cooperate in ameliorating the condition of the working man, by giving him a stake, and thereby an interest in the ground he cultivates, still, looking upon it as a grant extended to him as an encouragement for his toil, a stimulus to his industry, a little sphere for the exercise of his skill—viewing it as a subsidy and not as a *maintenance*—they feel assured that a larger portion would be more than the labourer's energies could constantly compass with equal justice to himself and his employer; they consequently conceive that such grant ought, in the majority of cases, to be restricted to a rood, the cultivation of which should be confined solely to the spade."

The subject under discussion in December, was the result of an experiment with Engraise Laine,

as compared with farm-yard manure, and folding with sheep.

The member who gave the result of his trial of this foreign manure, although applying on a pea stubble for wheat double the quantity he was recommended, assured the meeting that in places where he had used it he realized exactly the same weight per acre, as where he used no manure at all; but that where farm-yard manure was applied at the rate of 17 carts per acre, very superior and satisfactory crops were raised: the same observations held good as regards folding with sheep. With reference to the Engraise Laine, he wished to add, that the same unsatisfactory results were realized when only the *specific* quantity had been used.

In January, the members present took into consideration the proposed bill to consolidate and amend the laws relating to parochial settlement and removal of the poor, and resolved that it was their opinion that a settlement by either birth or residence, as contemplated by the proposed bill, cannot be considered a fair and just principle, on account of the great hardships which would most certainly be inflicted on all large towns and villages, where great facilities exist for building cottages for the residence of the poor; and that if such a system be adopted, the towns and villages will be very much injured, in consequence of their giving residence to a much larger population than at present legally belongs to them; while other parishes, being cleared of cot-

tages, will be benefited in an equal ratio, it being a well authenticated fact that many parishes do not contain a sufficient number of cottages to give residence to the labourers absolutely required for the proper cultivation of the land. They were also further of opinion that all parochial settlements, by whatever means acquired, are bad in principle, and tend to oppress the labouring man, acting very injuriously on the morals of the labouring classes, by narrowing the field of their exertions. The labouring man has nothing but his labour to depend upon for the support of himself and family, consequently he ought to be allowed full liberty to sell the same for the most money he can obtain, and at the best market; but this right cannot be attained under the present system, he being confined within the narrow boundary of the parish to which he belongs, which tends very much to place the inefficient labourer and man of bad character on an equal footing with the able workman and man of good character.

In order to obviate the difficulties before alluded to, the members present do most strongly urge the necessity of the immediate formation of whole unions for the purpose of district settlement and management of the poor, and that all property in each district or union be rated agreeably to the provisions of the parochial assessment act for the purpose of raising a common fund for the general management of the poor, and that the landlords (in lieu of the tenants) should be assessed for every cottage tenement or occupation that may be under the annual value of £10.

The above plan will give the honest labourer greater liberty to carry his labour to the best market, thus enabling him to reap the benefit of his skill and good conduct, and will tend materially to raise the moral standard of this class in the scale of society, as at present, skill and good character are not so much considered as the parish to which the labourer belongs; which has a very considerable tendency to depress his energies, and in a great measure place the inefficient and less deserving workman upon an equal footing with himself.

If the principle of district settlement and management of the poor be recognised and adopted, it might be then further extended to a county, and ultimately merged in a national system.

That the members present are most decidedly of opinion that until some plan of this kind be adopted, no alteration in the laws of parochial settlement will be effectual as a remedy for the evils attendant on the present system, and although they recommend that union or districts be formed for the purpose of general settlement and management of the poor, they only adopt it as a matter of expediency under existing circumstances; and are

most decidedly of opinion of its being perfectly correct in principle that the same should be made a national measure, in order that every description of property in the kingdom may be called upon to contribute its fair, full, and equitable quota, for the support and management of the poor.

On the 17th of February, "The relative position of landlord and tenant, with respect to the great variation in the value of agricultural produce, and the most desirable method of insuring a fair protection to both, with regard to letting and hiring," came under the consideration of the members present, by whom an unanimous feeling was expressed that long leases, based upon an equitable corn-rent, would operate with equal benefit to landlord, tenant, and labourer;—to the landlord because his estate would be kept in a better state of cultivation from his tenant being in a safer position to employ the necessary labour, added to the comfortable assurance felt by the lord of the soil in seeing his farms tenanted from father to son, in that social, hereditary compact known in former days;—to the tenant, because he would have a greater prospective encouragement for investing his capital and exerting his skill in making his land more productive, at the same time establishing that most desirable feeling of cordiality between himself and his landlord, arising from a reciprocity of mutual advantage; and to the labourer, from the foregoing facts operating materially towards insuring him more constant work, his employer being so circumstanced, as to do it with a more reasonable expectation of benefit to himself.

This subject having been considered by the club to be one in which all classes of the agricultural community were peculiarly interested, a copy of the foregoing resolution was handed to the Editor of the *Mark Lane Express*, *Bell's New Weekly Messenger*, and several provincial papers, all of whom testified their sense of its importance by giving it a place in their columns, and calling the attention of their readers to a reflection on its sentiments.

In March, the members present debated, "whether beet or turnips were the more desirable roots to cultivate on heavy land," and their comparative merits were embodied in the following resolution:—

"Beet is considered the best root to grow upon a heavy-land farm, owing to its greater certainty of plant, and early maturity; consequently allowing the same to be severed before the land is sodden with wet: thus affording an opportunity of ploughing the land previous to the winter, and doing less injury to the succeeding crops.

Skirving's Swedes are recommended as affording a larger time for making a fallow, the same to be

drawn and clamped up in November, and the land ploughed as early as possible for the following crop. These two kinds of roots to be sown on two-thirds of the land intended for root crops. The remaining third to be of Pudding, or White Loaf turnips, the latter for feeding stock till January, and then to be all cleared off the land. The land intended for the beet and Swede crop to be ploughed and cleared, as far as the season will admit, immediately after harvest, and laid up as dry as possible for the winter.

The subject proposed for April was, "the propriety of sowing a portion of the land intended for long summerlands, on heavy-land farms, with cole seed, with the view of foddering the same off with stock." The discussion which this topic elicited from a very full meeting of the members this evening, although variously expressed by the different individuals who took part in the same, seemed ultimately to merge into two branches upon which all were agreed: founded, however, more upon rational conclusions drawn from some practical results detailed by a few who had made trial of the advantages presumed in the subject under discussion, than from general experience:—

1st. Where autumnal food is required, the land should be made a good summerland by the first or second week in July, and sown with cole-seed immediately, the crop therefrom arising being fed off at the latest by the latter part of October.

2nd. But where it is desirable to obtain spring feed, it is recommended that the land intended for long summerland the following year, should be ploughed up immediately after harvest, and sown with cole-seed with a mixture of rye and tares (with a view of securing a very thick plant), and the same fed off the following spring: by these means affording ample time for making a good summerland for barley.

In the first case, this is considered a very excellent preparation for wheat, and should the autumn prove unfavourable for feeding the crop, it might be advantageously ploughed in for manure.

"An enquiry into the expenses of the different modes of draining, with the best method of performing the same," came under the consideration of the meeting in the month of May, the following being the conclusions at which they arrived:—

1st. Where mole plough draining is intended to be adopted (as it may be on lands with a fair fall, being perfectly useless on *flat* land), it is recommended to draw a level furrow about eight inches deep before the mole plough—which operation (from the land being then internally moist and externally dry) is best performed in the spring. The main drain should be immediately cut with the spade, for should a fall of rain occur previously to

such being done, it would materially spoil the mole drains. The whole of the foregoing operation will not exceed the sum of £1 11s. per acre, the drains being drawn every eight feet.

2nd. For spade draining, the furrow should be drawn as deeply as possible, and level at the bottom, the men following with the spades and increasing the same to 31 or 32 inches, more if practicable; a deep drain being desirable in many points, being out of the way of the horses' feet, the effects of drought, &c., and in loose soil will draw much further. All the leading drains are recommended to be done full four inches deeper, and considerably wider than the others; and in hilly land at a good distance from the headland. Sharp angles to be avoided in the leading drains, the water falling into them as obliquely as possible. This method, six yards from drain to drain, will give seven score per acre, which, including man, horse, and material for filling in, may be performed for £2 1s.

3rd. Tile draining may supersede with advantage the foregoing plans (where there is sufficient length of lease), on loose or gravelly soils, since the draining, filled with the best material, quickly becomes imperfect and totally inefficient: the operation should be done as deeply as possible, and if a natural fall be wanting, this defect must, if practicable, be supplied by an artificial one. The cost of tile, digging, manual and horse labour for six score per acre (which on such soils is deemed sufficient), will not exceed £3 15s.; though such outlay would of course be increased if there were far to cart the tiles. All the foregoing calculations were made, assuming wheat to be worth 6s. per bushel.

In June, "the propriety of carrying clay, marl, and heavy stuff on our arable lands" engaged the attention of the meeting, the following observations on the same being the result of the discussion:—

It is recommended to cart clay on clover, bean or pea stubbles, for wheat at the rate of 25 loads per acre; since by such process, the straw is stiffened, the quantity of corn increased, and the quality decidedly improved. This is to be understood with reference to deep-soiled, tender heavy-land: clay will also be found beneficial on lands that grow a superabundance of straw and corn likely to lodge; but is not to be carted too freely on thin skinned heavy-land. Too heavy a coat of clay on old ploughed land will do harm for several years by setting it fast. Clay may be profitably applied to layers and beans, but is thought somewhat injurious to barley and turnips. In all cases the quality of clay should be well considered, as, if very stiff, the same benefit will not accrue as from the use of a milder description.

Marl was reckoned very desirable for mixed-

soil land—chalk rubbish beneficial on lands where turnips were liable to Anbury; and marsh ooze preferable to clay, on mixed soil and light lands. Probably the same observations would apply to heavy land.

In conclusion, it was hinted, that ditches round the field might be made wider and deeper, for the purpose of obtaining clay, and that the same might be carted on the land in the winter season.

The propriety of collecting dung off the pastures in the summer months, with a view of increasing and improving the manure on the farm, being brought before the meeting in July, it was strongly recommended that the dung should be collected from off the pastures, as in all cases where it was allowed to remain, the feed became long and sour, and the cattle, consequently, refuse to eat it.

When collected, the dung to be carried into the par-yards or dunghills, there to be incorporated with the other manure. At any rate, if not gathered, the dung ought frequently to be spread about the land.

The club having been prorogued at the July meeting till that fixed for October (the intervention of harvest being thought a sufficient reason for this temporary interruption), the members re-assembled on the 20th for the purpose of arriving at the best method of cultivating the potato crop, both in garden and field.

It is but due to the member introducing this subject before the meeting, to state, that his remarks bore ample evidence of considerable research and careful compilation, numerous (and in some cases very *novel*) details respecting the different methods of rearing this valuable vegetable, with the result of each experiment in weight, cost and quality, hav-

ing been extracted from that valuable record of horticultural facts, the "Gardeners' Chronicle," and read to the members present. On summing up the amount of evidence deducible from these detailed experiments, the leading points towards a profitable cultivation of the potato appear to be these—

1st. Deep ploughing and thorough drainage.

2nd. Autumnal planting.

3rd. Careful selection of the seed (the same being of a middle size, and entire potatoes in preference to sets).

4th. Allowing sufficient space between the drills.

These seem to be the principal desiderata, but owing to the fatal disease so prevalent this season in almost every district in which the potato has been cultivated, and the absence at present of a sufficiently weighty assignable cause for so universal a disorder, the club have determined on instituting a series of experiments, the result of which shall be made known to the society at the termination of another year.

The few remaining observations which your committee have to make are of a highly satisfactory character. The monthly meetings throughout the past year have been better attended than in any during the last few years; new members have from time to time been added to it; the funds appropriated for awards to the cottage allotment prizes, have been augmented by fresh donations from several gentlemen resident in the neighbourhood; and our former contributors have generously continued theirs.

For the Committee,

ROBERT HUGHMAN, Secretary.

Yoxford, Dec. 1st, 1845.

THE BARON;

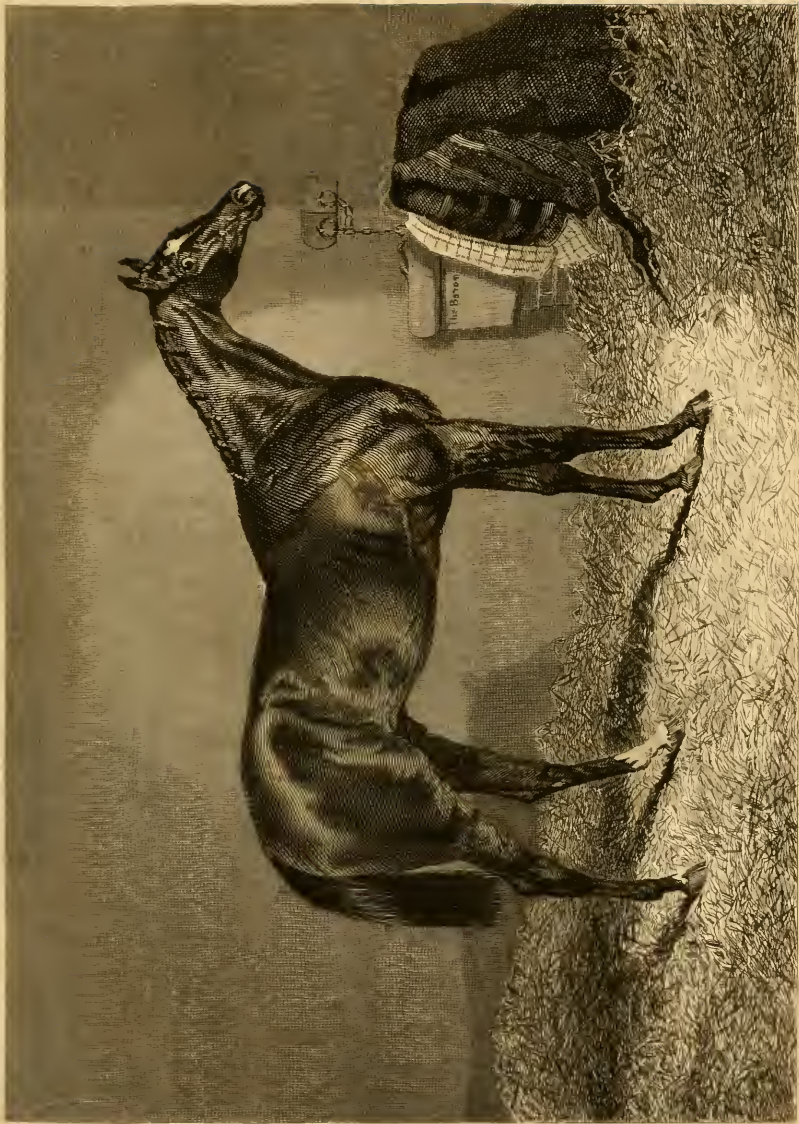
WINNER OF THE ST. LEGER, 1845.

The Baron, a dark chesnut horse, was bred by his late owner, Mr. Watt, 1842, and is by Irish Birdcatcher, out of Echidna by Economist, her dam Miss Pratt by Blacklock — Gadabout by Orville—Minstrel by Sir Peter—Matron by Florizel—Maiden.

Echidna, who never appeared on active service, is quite a young mother, the Baron we believe, being her son and heir; though not having the last volume of the Stud-book at our elbow, we don't say so on authority.

Birdcatcher, the sire of the Baron, winner of the St. Leger this season, is own brother to Foig-a-

ballagh, winner of it last, being by Sir Hercules, out of the celebrated Guiccioli by Bob Booty, out of Flight, by Escape, now perhaps considered the best brood mare in the world. As a race-horse Birdcatcher will always rank high, though unfortunately, as far as absolute success went, his ever-ready and able opponent was generally found in the invincible Harkaway; while, as a stallion, Oh Don't, Micky Free, Honest Ned, The Cook, Beatrice, Ballinkeele, The Poacher, and that very promising two-year-old, Osprey, assist the Baron in doing the paternal honours, and convincing the sporting public that *all* of 'em can run a bit.



In colour the Baron is a *very* dark chesnut, with one white heel and a star in the forehead, in height about fifteen hands three inches. He has a long head, with very projecting forehead (not what is termed Roman nose, for it dips in and becomes very taper), his neck rather short, straight, and light; his shoulders—perhaps his most striking feature—very beautiful; withers high, and shoulders particularly oblique. Large fore-ribs, but back-ribs short, loins arched, quarters drooping; very full in the gaskins; good arms and thighs, but on rather a high leg. He is altogether a wiry,

useful-looking animal, but by no means carrying anything particularly striking in his appearance. In the stable he is as quiet as a lamb.

Mr. Watt, the owner and breeder of the Baron, is better known in his own country, in Dublin, and on the Curragh, as "Watt the Veterinary," a cognomen denoting the high rank he holds in that profession. On the turf, too, he has always been pretty forward; and very lately with King Dan, Patriot, Wexford, Pickpocket, and Co., has contrived again and again to bring the scarlet colours home in the right place.

THE PRODUCE OF DISEASED POTATOES WILL BE DISEASED.

In the official report on the potato crop, by the late Irish commission, dated Nov. 7, 1845 (see p. 767, 1845), is the following paragraph: "It has also been ascertained by actual experiments that potatoes, though diseased, will grow and produce *apparently* healthy plants." Nevertheless, the commissioners thought it imprudent to recommend the employment of such potatoes, "except by way of experiment;" thinking, no doubt, that the evidence in their favour was inconclusive. We greatly regret to state that the event has justified their caution. We are now in a condition to announce positively that, although diseased potatoes will produce plants which for a few weeks appear to be healthy, yet they will not remain so, and that *diseased sets will perpetuate disease*.

It was stated at the meeting of the Horticultural Society, on Tuesday last, that it had been for some time rumoured that the new potato crop was again attacked in forcing-houses by the old disease; that these rumours had become so frequent as to cause strict inquiry to be made into their truth; and that the result of that inquiry was a *confirmation of the reports alluded to*. Potatoes were produced from Mr. Barnes, gardener to Lady Rolle, at Bicton, in which the disease had manifested itself in a manner not to be mistaken; first, by the appearance of a brown gangrene on the haulm underground and in the neighbourhood of the old tuber, and next by rotting blotches on the leaves. These potatoes had been planted in the autumn. In the month of January "they were as strongly and evenly above-ground as I ever saw a field of potatoes in May," are Mr. Barnes's words. The disease was remarked upon taking up a portion for transplanting to a hotbed for forcing. Of the samples produced to the meeting of the Horticultural Society, one, and much the worst, was the produce of "rather badly affected tubers;" in these the whole of the under-ground haulm was already gangrened and brittle. Another sample, from tubers *supposed to have been sound*, also manifested the symptoms in putrefying blotches on the leaves, accompanied by the under-ground gangrene.

In addition to this Devonshire evidence, it was mentioned that plants in the garden of the Horticultural So-

ciety, examined the previous afternoon, were found in the same state, the under-ground haulm having already begun to decay in blotches. It was added that these plants were also obtained from diseased tubers, planted for the express purpose of watching the progress of growth. No trace of fungi could in their instance be discovered on the decaying spaces after the most careful examination of some hours' duration; but a white mouldiness had manifested itself on the stems sent up from Bicton.

But this is not all. Upon examining more carefully the young potatoes formed by the diseased sets, we found still further evidence of latent mischief. Some of Mr. Barnes's potatoes had formed tubers and roots without haulm or foliage; they were what are called in Cornwall "Bobbin joans." In one of these the brown colour on the walls of the cells, the earliest symptom of disease, was already appearing in numerous minute places, *in the very centre* of the young potato [this potato became black after twenty-four hours' exposure to air]; others were decaying on the surface, and one of them *had already rotted away*. We now, therefore, warn the public that *diseased sets will produce a diseased crop*. Not a shadow of doubt remains upon that point.

But unfortunately this intricate question is not settled by such an announcement. On the contrary, a far more serious consideration remains behind. Can we regard the sound (?) potatoes saved from the diseased fields of last year as fit for seed? It may be rash to venture upon any prediction concerning so wholly unknown a subject; but nevertheless the interests involved in this question are so mighty, that we must be content to bear the reproaches which may be poured upon us if we hazard an opinion which the result may not confirm. We venture, then, to declare thus early, that *great doubts exist as to the fitness for seed of apparently sound potatoes from diseased districts*. That the remaining potatoes of last year's crop are in an unusual condition is certain; they are more excitable; they will sprout much quicker than is customary. At this early period potatoes are found in a state of advanced growth when the pits are opened; and this has taken place much be-

yond what can be ascribed to the peculiar mildness of the season. In fact, the old tubers of last autumn began to grow in a few weeks after they became ripe, or what seemed so; an event unknown in previous potato culture. Why this is we know not, nor shall we embarrass ourselves with inquiring whether it is owing to this or that chemical peculiarity. It may be very true that the potatoes have formed unstable *casein* instead of stable *albumen*; or some other explanation may be more correct. For us it is enough to know that the *vitality of the potato is affected*. The living principle is changed; of that no doubt can exist; and such being the case, it is much to be feared that the disease of last year will continue to appear until, or except where, the original constitution of the potato is recovered.

But we would not sound a note of alarm upon mere speculations. We grieve to announce that we have now before us evidence that confirms the view we have ventured to take. Among the Bicton potatoes above alluded to was one which the most practised eye would, we think, have pronounced sound; its skin was clear, its texture uniformly pale yellow, with no tendency to change colour when exposed to the air, and its surface had not a blemish, with the exception of a small very narrow short streak on one side, which seemed to have been the scratch of a fork. This potato pushed vigorously; its main stem is half an inch in diameter; it must have shown all the symptoms of the most robust health; and yet gangrene has attacked the haulm just above the tuber, and the usual blotchings have appeared upon the leaves. This potato plant is unequivocally diseased.

We will suppose that some trace of disease could have been found in this potato, by cutting it into thin slices, though we have failed to discover them by that process. Admitting this, yet it is perfectly clear that if healthy potatoes can only be discovered by such a process, *the crop of next season is DOOMED* wherever sets from diseased fields are employed.

We therefore warn the country, in the most emphatic language that words are capable of conveying, to think well of what is coming; to plant no potatoes to which suspicion attaches; and, if sets from uninfected districts cannot be procured, to crop their land with something else. There can now be no doubt that in the absence of such precautions *there is no security for the potato crop of 1846*.

[Since writing the above, we have received confirmation of our worst fears. Mr. Errington, gr. to Sir Philip Egerton, at Oulton, in Cheshire, writes that in a garden near him "the early kidney potatoes in frames are *totally destroyed*." He adds that he "saw the frames last week, and the stems have mortified from the leaves downwards, *exactly as they did in the open fields last September*."

Mr. James Cuthill, of Camberwell, informs us that Mr. Hale, a market-gardener at Ware, in Hertfordshire, has had his early potatoes attacked with last year's disease: that "*half his crop*, amounting to about 60 lights, *is gone*;" that the plants "were looking well, and about 8 inches high, and *all at once* they were attacked." Mr. Hale, florist, Stockwell, saw these pota-

toes, and authorises Mr. Cuthill to say so; the owner was dusting them with lime.

We have received a sample of potatoes from Mr. Milburn, of Thorpfield, near Thirsk, just taken out of the pits, and "quite sound as far as he can judge," in which indeed there is not the smallest outward sign of decay, and yet we find every one marked with the disease upon cutting into them. We are also informed that the forced potatoes at Col. Wyndham's, at Petworth, have proved to be diseased, although great care was taken in picking out what appeared to be sound sets. Of this last case, however, we have no certain knowledge as yet.]
—Gardeners' Chronicle.

THE POTATO DISEASE IN HOLLAND.

The extent to which the potato disease has extended its ravages in Holland may be gathered from the following official return published by M. Decaisne in a valuable pamphlet* which has just reached us, in which we have the satisfaction to find that the learned author takes exactly the same view of the probable cause of this disaster as we have done from the first.

	Hectares.	Attacked by the Disease.
North Brabant .	10,676	10,661
North Holland .	2,287	1,121
South Holland .	12,310	10,943
Zeland	4,686	3,748
Frisland	10,816	7,998
Overysse	7,326	5,461
Limbourg	7,113	2,254

From these data M. Decaisne concludes that two-thirds or perhaps three-fourths of the crop have been affected. France, it appears, has sustained less loss, as might have been anticipated from its more southern latitude; it is calculated that around Paris the loss has not exceeded five or six per cent. of the crop, if some low situations are excluded from the estimate. In Belgium, however, the mischief has been enormous, as in Holland. No such return as that obtained by the Dutch Government has been published; but M. Decaisne's investigations lead him to rate the loss at two-thirds of the crop in some provinces; and he adds that in a great number of cases (*une foule des localities*), the late sorts have been *totally* lost.

Our statistical friends, who occupy themselves with this sort of inquiry, may like to see the following returns of the amount of the potato crop in Belgium for the years 1843 and 1844. In 1845 the return is unknown.

	1843.	1844.
	Hectolitres.	Hectolitres.
North Brabant	2,333,793	1,993,197
Guedres	2,897,701	2,504,527
South Holland	1,681,196	1,536,967
North Holland	275,975	533,250
Zeland	805,464	764,888
Utrecht	453,841	344,792
Frisland	2,126,157	1,830,006
Overysse	1,116,390	1,348,880
Groningen	1,395,247	1,349,533
Drenthem	622,957	650,777
Limbourg	753,850	695,263

The general diminution of the crop in 1844 is stated to have arisen in part from the enormous cultivation in Java of rice, which the Belgians take from the Dutch, and in part from the increase of the madder-fields of the former.—Ibid.

* Histoire de la Maladie des Pommes de terre, en 1845.

REPORT OF THE BRAINTREE CHURCH-RATE CASE.

BY CUTHBERT W. JOHNSON, ESQ.,

ONE OF THE COUNSEL IN THE CAUSE.

COURT OF QUEEN'S BENCH, WESTMINSTER, BEFORE LORD DENMAN (CHIEF JUSTICE),

MR. JUSTICE PATTESON, MR. JUSTICE COLERIDGE, MR. JUSTICE WIGHTMAN; JANUARY 16.

This great case, which has now for several years engaged the attention of the courts of law, is much too interesting to a large portion of the readers of this magazine to require any apology for a report of it being inserted in this place.

A brief review of the facts of the Braintree case may perhaps be useful to refresh the memories of those who have some prior knowledge of the cause, and to enable those who have none to understand its general bearings.

In the year 1837, the church of that parish being very considerably out of repair, a rate having been twice refused by the vestry, and there being, from the preponderance of dissent in the parish, no probability that a voluntary rate would ever again be imposed, the churchwardens, Messrs. Veley and Joslin, determined to adopt the only course which then appeared open to them, by acting upon the opinion stated, in the Report of the Ecclesiastical Commissioners, to be entertained by "some very learned persons," that "if the vestry refuse a rate, the churchwardens may of their own authority make it."

With this view a vestry meeting was convened, and held on the 2nd of June, 1837, at which proper estimates were produced, and a rate of three shillings in the pound proposed. An amendment was moved, which, after censuring the vicar and churchwardens for again agitating the question, reiterated the resolutions of a former meeting, to the following effect:—

"That it appears to this meeting, the existing law, which authorizes churchwardens to convene a parish meeting for the purpose of levying a church-rate, does also recognize what is called the voluntary principle to this extent—that by it no church-rate can be laid but by the free consent of a majority of parishioners duly assembled in vestry to determine upon it.

"That the parishioners of Braintree are fully prepared to vindicate this redeeming feature of the law as it now stands, by freely exercising the just rights that law secures to them, and determining for themselves whether a church-rate shall now be laid or not,

"That having accordingly well considered the proposition to levy a church-rate on the present occasion, and the principles involved in that proposition, it is their matured conviction, that so long as the parochial churches are exclusively devoted to the use of the established sect, all expenses of repair should be defrayed out of the ample revenues of that richly endowed sect; or if there be no ecclesiastical funds available for such purposes, that all expenses of repair should be defrayed by the voluntary contributions of those who exclusively enjoy the use of the buildings; and finally,

"That the consideration of a church-rate be postponed to this day twelve months."

This amendment was carried on a show of hands. A poll was demanded by the churchwardens, and taken in the vestry on the 5th and 6th of June; the result of which was, that the amendment was declared to be carried, and the meeting was thereupon dissolved.

No doubt whatever existing that the adjournment for twelve months was virtually a refusal, the churchwardens proceeded by themselves, and of their own authority, to make a rate of three shillings in the pound, which they signed at a private meeting in the vestry room, on the 10th June, 1837.

To enforce the payment of the rate so made, a suit for subtraction of church-rate was instituted in the Consistory Court of London, against Mr. Burder, an inhabitant and one of the largest occupiers in the parish. The admissibility of the libel was opposed before Dr. Lushington, the judge of that court, by which the question of the validity of the rate was raised at the very outset; and upon that question Dr. Lushington gave judgment, on the 16th of November, 1837, in favour of the churchwardens, conceiving himself bound by a precedent which was cited to him in the course of the argument, but intimating pretty plainly that his own opinion was the other way.

Mr. Burder, the defendant, immediately applied to the Court of Queen's Bench, for a writ of prohibition.

The matter was solemnly argued, and after a delay of nearly a twelvemonth, Lord Denman, C. J., de-

livered the judgment of the court, that the rate was bad, and that the prohibition ought to issue, "on the ground that the supposed church-rate was a nullity, as having been made by persons who had no authority to make one, in defiance of the declared dissent of the vestry."

The churchwardens appealed to the Court of Exchequer Chamber, and the case underwent for the third time a laborious and searching investigation. The result was the judgment delivered by Lord Chief Justice Tindal, on the 8th of February, 1841, affirming the judgment of the Queen's Bench.

The writ of prohibition issued accordingly, and thus terminated the first Braintree church-rate case.

But the main question involved in the case was placed in a perfectly new light by the clear and convincing exposition of the law laid down in the judgment of the Exchequer Chamber. The eight learned Judges of that court, in pronouncing their concurrence in the judgment of the Queen's Bench, most carefully guarded themselves against being held to concur in the reasoning on which it was founded. They declared that a rate made under the circumstances brought before them was illegal and bad. Beyond this they were not called upon to adjudicate; but they threw out a most remarkable suggestion, founded upon a distinction which in none of the previous judgments, or in the arguments of counsel, had ever been adverted to. They said, "It is obvious, indeed, that there is a wide and substantial difference between the churchwardens alone, or the churchwardens and minority together, making a rate at the meeting of the parishioners when the refusal takes place, and the churchwardens possessing the power of rating the parish by themselves, at any future time, however distant. It is unnecessary, however, to discuss this point, as the facts of the case do not bring it before us. It is sufficient to say, whilst we give no opinion upon it, that we desire to be understood as reserving to ourselves the liberty of forming an opinion whenever the case shall occur."

It was to be expected that the churchwardens would act upon the suggestion here thrown out. And, accordingly, after holding a vestry on the 13th May, 1841 (which was merely a formal one, for the purpose of ascertaining that the majority still persisted in refusing a rate) a monition was obtained from the Consistory Court of London, requiring the churchwardens and parishioners to meet in vestry on a given day, and make a rate for the repairs of the church.

In pursuance of the monition, another vestry meeting was held on the 15th July, 1841, when fresh estimates were produced, and a rate of two shillings in the pound proposed;* which was met by the following amendment:—

* This, though apparently lower, was in reality higher than the rate of three shillings in the pound,

"That all compulsory payments for the support of the religious services of any sect or people appear to the majority of this vestry to be unsanctioned by any portion of the New Testament scriptures, and altogether opposed to and subversive of the pure and spiritual character, of the religion of Christ. But that for any one religious sect to compel others, which disapprove their forms of worship, or system of church government, or which dissent from their religious principles and creeds, to nevertheless submit to, support, and extend them, appears to this vestry to be yet more obvious invasion of religious freedom and violation of the rights of conscience: while also it appears to be a gross injustice to dissenters, as citizens, to compel them to pay for the religious services of others, in which they have no part, while they build their own chapels, support their own ministers, and defray the charges of their own worship.

"That compulsory church-rates, and more especially such rates upon dissenters, thus appearing to be as a tax unjust, and as an ecclesiastical imposition adverse to religious liberty and contrary to the spirit of Christianity, this vestry feels bound, by the highest obligations of social justice and of religious principle, to refuse to make a rate, and does refuse accordingly."

The amendment was carried, on a show of hands: no poll was demanded, as there was no expectation of a different result. But the churchwardens, then and there, openly in the face of the vestry, declared, that in obedience to the monition they should themselves make a rate of two shillings in the pound. The rate was accordingly produced, and signed by the vicar, the churchwardens, and a number of other parishioners. The opponents of the rate protested against the proceedings *in toto*, and the meeting separated.

A suit for the recovery of this rate was commenced against Mr. Gosling, an occupier of land within the parish, by whom payment had been refused. The admissibility of the libel was again opposed, and Dr. Lushington gave judgment on the 4th May, 1842, rejecting the libel.

Against this judgment the churchwardens appealed to the Arches Court of Canterbury. A fifth time the war of tongues was waged with unabated energy and ability, and a fifth time was the law as applicable to this case, expounded from the judgment seat. Sir Herbert Jenner Fust, on the 25th of March, 1843, reversed the decision of Dr. Lushington, and admitted the libel, thereby adopting the distinction, and establishing the principle, referred to in the judgment of the Exchequer Chamber.

Upon this an application was made to the Court proposed in 1837, the parish having in the interval undergone a fresh valuation.

of Queen's Bench, and a writ of prohibition obtained directed to the Ecclesiastical Court. To this the churchwardens demurred, and it is the arguments on the writ of prohibition which I have now to report.

The ATTORNEY GENERAL (with whom were C. W. Johnson and R. Ogle), who was for the churchwardens, commenced by recapitulating the course of the first Braintree Church-rate case: he deemed it unnecessary to go into the large mass of authorities which was then cited, since the case had been very much narrowed by the decision of the Exchequer Chamber; who, far from concurring in the doctrine that in no case could a valid rate be made by a minority of the parishioners in vestry assembled, threw out several hints of various modes by which a valid rate might be made by the minority of the vestry, for necessary repairs; and in their judgment they say:—

“We do not enter into the discussion whether a rate so made by the churchwardens at the parish meeting where the parishioners are met would be valid or not, or how far such case may be analogous to that of the members of a corporation aggregate, who being assembled together for the purpose of choosing an officer of the corporation, the majority protest against and refuse altogether to proceed to any election; in which case they have been held to throw away their votes, and the minority who have performed their duty by voting, have been held to represent the whole number.* It is obvious, indeed, that there is a wide and substantial difference between the churchwardens alone, or the churchwardens and the minority together making a rate at the meeting of the parishioners when the refusal takes place, and the churchwardens possessing the power of rating the parish by themselves, at any future time, however distant. It is unnecessary, however, to discuss this point, as the facts of this case do not bring it before us. It is sufficient to say, whilst we give no opinion upon it, that we desire to be understood as reserving to ourselves the liberty of forming an opinion whenever the case shall occur.”

After examining the judgment of Dr. Lushington (3 Curtis, 266), and the refusal of the Court of Queen's Bench to grant a mandamus (3 Queen's B. R. 589) to compel the churchwardens of a township to make and assess a rate to pay their portion of a rate imposed by the churchwardens and a minority of the vestry of the parish of Bradford, he proceeded—The great question is now involved whether the parishioners may at their will or caprice suffer their parish-church to fall into decay, or whether this mode of raising a rate for necessary repairs—a mode consonant with reason, and which is not

without solemn decisions in its favour—shall be declared to be legal. As to the origin of church-rates he was content to take the account as given by Dr. Lushington (*Smith v. Keats*, 4 Haggard, 278) although rather inconsistent with a decision of the same judge (3 Curtis, 293).

It then becomes of importance to consider the extent of the obligation imposed upon the parishioners to repair their parish church. Now this had been clearly defined by Tindal, C.J., in delivering the opinion of the Exchequer Chamber (12 A. and E. 300), where he observes:—

“In order to open the grounds and reasons of our decision, it will be necessary to explain, in the first place, the nature of the legal obligation by which the inhabitants of every parish are compellable to repair and keep in repair the fabric of the parish church; and in the next place, the mode prescribed by law for carrying such obligation into effect. From the consideration of which points it will be seen at once, and by necessary inference, whether the church-rate now under discussion is a legal and valid rate, or the contrary.

“And we are all of opinion that the obligation, by which the parishioners—that is, the actual residents within, or the occupiers of lands or tenements in every parish—are bound to repair the body of the parish church whenever necessary, and to provide all things essential to the performance of Divine service therein, is an obligation imposed on them by the common law of the land.

“That such obligation is not grounded on the force of the general ecclesiastical law is manifest from this—that by the authority of all the writers on the general canon law, the repairs of the whole of the parish church, both the body and the chancel, fall upon the rectors or owners of the tithes, except that by custom, in some countries, part fall upon the parishioners. Whereas, in England, to use the words of Johannes de Athonâ, in his “Commentary on the Legatine Constitution of Cardinal Othobon,” passed in the year 1268, ‘By the common custom of England, the repair of the nave of the church in which the lay parishioners sit falls upon the parishioners themselves; but the repair of the chancel falls on the rector.’ Or again, as Lyndewode says, page 53, ‘By custom,’ that is, by the common law, ‘the burden of reparation, at least of the nave of the church, is transferred upon the parishioners.’

“No trace can be found in any of our books of an obligation on parishioners to repair the parish churches throughout the whole of the realm, less wide and extensive than this.”

If, then, it is a common-law obligation, no option can be allowed. Would it be endured that the parishioners should be allowed to remove the church, in which every parishioner has a right to a seat, and

* *Oldknow v. Wainwright*, 2 Burr., 1017. *Re v. Hawkins*, 10 East., 217. *Re v. Foxcroft*, 1 W. Black, 229.

to destroy the churchyard in which he is entitled to a place of burial? and is there any difference in principle between the destruction of the church and the church-yard, and the suffering of them to fall into decay? Can an entire county be allowed to suffer their roads or bridges to remain unrepaired?

The common-law liability of the parishioners being established, let us see how these rates have been usually raised. Now there is a correct list of authorities from 44 Edward III., that the church-rates have been apportioned by the vestry, and in their absence by the churchwardens; here again the judgment of the judges of the Exchequer Chamber is clearly expressed, where they say:—

“As little difference of opinion arises as to the validity of a rate imposed by the churchwardens alone where a meeting of the parishioners has been duly convened in vestry for the purpose of making such rate, but where none of the parishioners have thought fit to attend and express an opinion. For in this state of circumstances the churchwardens, who may be assumed to be parishioners themselves, do in effect constitute the majority, or, more properly speaking, the whole of the parishioners who are assembled in vestry; and therefore, upon the principle above laid down, they must have authority to bind the absent parishioners.”

If the churchwardens refuse to call a meeting to make a church-rate; the Ecclesiastical Court will grant a monition to compel them to do so, and this court will grant a mandamus (*Rex v. St. Margaret and St. John*, 4 M. and S., 250). Now in this case the meeting had assembled, but the majority refused to make a rate, in defiance of the common law of the land, thus described in the decision of the Court of Exchequer Chamber (12 A. and E., 302):—

“Such, then, being the law of the land, it follows as a necessary consequence, that the repair of the fabric of the church is a duty which the parishioners are compellable to perform—not a mere voluntary act which they may perform or decline at their own discretion; that the law is imperative upon them absolutely that they do repair the church—not binding on them in a qualified limited manner only, that they may repair or not, as they think fit; and that where it so happens that the fabric of the church stands in need of repair, the only question upon which the parishioners, when convened together to make a rate, can by law deliberate and determine, is—not whether they will repair the church or not (for upon that point they are concluded by the law)—but how and in what manner the common-law obligation so binding them may be best and most effectually, and at the same time most conveniently, performed and carried into effect. The parishioners have no more power to throw off the burden of the repair of the church, than that of the repair of bridges and high-

ways; the compelling of the performance of the latter obligation belonging exclusively to the temporal courts, whilst that of the former has been exercised usually, although perhaps not necessarily exclusively, by the spiritual courts from time immemorial.”

Now in this case the parishioners did meet, when duly summoned; but, having met, they refuse to entertain the question of a church-rate altogether, and instead of doing so, they go into the discussion of totally irrelevant matter; and there is no difference in principle between the refusal of the parishioners to attend the meeting, and, being assembled in vestry, in refusing to enter into the question: this principle may be gathered from various cases (*Oldknow v. Wainwright*, 2. Burrows, 1017; *1. W. Blackstone*, 229; *King v. Parry*, 14. East, 549).

After referring and examining the cases of *Roberts and Others*, *Hetley's Reports*; *Rogers v. Davenant*, *Modern Reports*; *Pense v. Prowse*, *Lord Raymond's Reports*; *Blank v. Newcomb*, *Modern Reports*; *Dawson v. Wilkinson*, *Andrew's Reports*; *Groves v. Rector of Hornsey*, *Haggard's Reports*; *Thurston v. Jones*, *Ventris' Reports*; and *Gaudern v. Silby*, *Curtis' Reports*; with the observation, upon case that made by Sir H. J. Fust, the Attorney-General, in conclusion, contended that the question to be decided was, not whether the parish is to be taxed by the minority, for the tax is imposed by the common law, but whether in this case of the enforcement of a common-law liability, the authority of the case of *Gaudern v. Selby* is not binding upon this court; but even if in that position the court should be against him, then he was remitted to his original argument, and submitted that the minority of the vestry may, under the circumstances of the case, make a valid rate.

The SOLICITOR-GENERAL (with whom were Baines, Serjeant, and T. J. Arnold) contended that this was a case in which it was sought to tax the plaintiff without his consent. He did not deny the common-law liability of the parishioners to repair their church, but he contended that in the absence of the correct execution of their duty, no one else can tax them. In this case, too, he had a technical objection, that the rate in question was never put to the meeting, as it ought to have been, after the amendment had been carried.

(CHIEF JUSTICE DENMAN: They by their amendment refused to make any rate.)

In this case he contended that he was not called upon to produce authorities to prove the illegality of the rate; but if he was so bound, then he would be ready to show that with the single exception of *Gaudern v. Selby*, all the authorities were in favour of the plaintiff. He here cited *Gibson's Codex*.

As to the danger of the church falling down, and the insufficiency of the law to compel the parish to repair their church, by the undoubted means, by interdict and excommunication, which the Ecclesiastical courts possessed—supposing the assertion to be correct, why then it is for the legislature and not for this court to provide a remedy. The Court of Queen's Bench, in their judgment in the former Braintree case, remarked:—

“The Consistory Court decided against this defence regularly pleaded, and has thereby raised the question, whether the churchwardens have power to impose a church-rate against the declared will of the inhabitants in vestry assembled.

“In debating this question at the bar, the ancient doctrine, that by the custom of England the inhabitants are bound to repair the body of the church and to inclose the church-yard, was not disputed; a doctrine fully stated by Holt, C.J., as quoted by the Queen's Advocate, in arguing the present case in the Consistory Court: ‘By the civil and canon law the parson is obliged to repair the whole church, and so it is in all christian kingdoms but in England, for it is by the peculiar law of this nation that the parishioners are charged with the repairs of the body of the church.’* ”

“Neither was that proposition denied on the part of the plaintiff, or that a church-rate is matter of ecclesiastical cognizance, or that the churchwardens are entrusted with the expenditure of the rate so levied, and liable to spiritual censures for neglect of their duty therein. But the question is, whether, in case of refusal by the parishioners, the churchwardens are empowered to impose a rate for that purpose, and indeed compellable by spiritual censures so to tax their fellow-parishioners.

“If they have not this power, and are subject to this liability, the defendants argue that there would be a wrong without a remedy; a striking argument, no doubt, as that is an anomaly abhorrent to the law of England. The wrong is, neglect of duty by parishioners; the remedy is supposed to be found in the power of their officers to tax them. But the history of ancient times establishes that the law did apply a remedy, such as was found then, and was expected always to continue, amply sufficient to secure the reparation of churches—the proceeding by interdict, which suspended the performance of ecclesiastical rites in the refractory parish, or the proceeding by excommunication against every parishioner.

“This argument would also be entitled to the greatest consideration, if the law subjected churchwardens to any personal inconvenience, as a conse-

quence of the church remaining unrepaired, when destitute of the funds requisite for upholding the fabric, or supplying any of its wants to which a church-rate is applicable. If in such a state of things they could be sued for injury done to a passenger on the highway by the decayed church wall coming down upon him, or indicted for a nuisance by its fall there, as has been surmised; if they could be punished for not laying out their money in repairs, that law, if it also prohibited them from obtaining full indemnity from those whom at the same time it pronounces to be primarily liable, would be chargeable with manifest inconsistency and injustice. Such liabilities indeed, if recognized by general usage, or even by a prevailing practice for them to make advances to that end, would tempt us to imply, from the custom of England, which charges the inhabitants with repair of churches, a power in the churchwardens to reimburse themselves from their neighbours' funds, even though that power had never been exercised. But no instance has been found of a churchwarden being thus visited: on the contrary, numerous authorities in our reports establish the proposition, that churchwardens can only be liable in respect of moneys come to their hands; and all that appears in the books of ecclesiastical law, with reference to the duties of those officers, is qualified by the supposition that the parish has furnished them with the adequate resources. Nor have churchwardens been in the habit of making such advances.

“The plaintiff, in this present suit, has the right to cast the burden of proof on his adversaries.

“The law requires clear demonstration that a tax is lawfully imposed. No Act of Parliament vests in the parish officers such a power as these have exercised, nor recites that such a power exists, by common law or custom. No book of reports affirms it; no such usage in fact prevails in the land; an opposite usage prevails: the church-rate is constantly imposed by the inhabitants in vestry assembled. In *Gibson's Codex*, 220, it is said— ‘Rates for reparation of the church are to be made by the churchwardens, together with the parishioners assembled, upon public notice given in the church. And the major part of them that appear shall bind the parish; or if none appear, the churchwardens alone may make the rate, because they, and not the parishioners, are to be cited and punished in defect of repairs.’ ”

As to the arguments that this is a tax imposed by the common law, which the parishioners are obliged to pay, why all these, and others of a similar kind, were exactly those which were employed in the great case of ship-money, in the reign of Charles the First. As to the comparison with a county-rate, he would ask, if a majority of the ma-

* *Hawkins v. Rous*. Carthew, 360.

gistrates refuse to make a county-rate, can the minority make an assessment?

(JUSTICE PATESON: Your analogy fails there, because you may indict in one case, but not in the other.)

If the Court decide that the minority may make a rate, they will hereafter have to sit to inquire into the reasons why the rate was made.

He cited and remarked on *Pense v. Prowse*, *Dawson v. Wilkinson*, and the *King v. Muuday* (Cowper, 530); and contended that the very title or heading of the rates expressed that they were made "by the churchwardens and parishioners."

He commented upon the judgment of the Court of Queen's Bench in the former Braintree church-rate case, which, he contended, decided this case; and upon *Gaudern v. Selby*, which last he deemed to be of no authority. Suppose the case of a mandamus from this court to a corporation to affix their seal to a bond, and that the majority of the corporation refuse, may the minority do it? In conclusion, he referred to the whole current of authorities, as showing (*Gaudern v. Selby* only excepted) that a church-rate can only be made by a majority of the vestry.

The ATTORNEY-GENERAL, in reply, contended that none of the arguments of the Solicitor-General had shaken the case of the defendants. That no particular form of putting the question of a rate to the vestry was laid down by any authority. That the sense of the vestry was clearly and fairly taken; and that they had resolved that "no church-rate" should be granted. He compared these proceed-

ings to the election of a member of Parliament, where the only mode of defeating the election of any candidate was by voting for another. The case of ship-money bore no analogy to this. There no debt was due to the Crown. Hampden's defence was, that there was no liability. As to the case of county or parish or highway-rates, there is another remedy provided; for you may indict the county or parish, or the case is provided for by an act of Parliament. In the case of a refusal to make a poor's-rate, an absolute mandamus goes in the first instance to the parish officers to make a rate; and as to the case of a mandamus to a corporation to affix a bond, he supposed that if, in compliance with such a mandamus, the bond was produced with the proper seal affixed, the Court would not be very nice in their inquiries as to how that seal was affixed. The case differs materially from that of *Veley v. Burder*, formerly decided by this Court. In that case eight days elapsed between the refusal of the vestry and the making of the rate; here the rate was made at the meeting. *Thursfield v. Jones*, and *Gaudern v. Selby*, were there cited in support of the proposition, that at any time after the refusal of the vestry, the churchwarden alone might proceed to make a rate. In conclusion, on these grounds, on the authority of *Gaudern v. Selby*, and the other cases he had cited, and in the total absence of all other cases to the contrary, he claimed the judgment of the Court in favour of the defendants, the churchwardens.

Lord DENMAN: "The Court will consider of their judgment."

DINGLE'S HAND-DIBBLING MACHINE.

REGISTERED BY MESSRS. WILLIAM E. RENDLE, AND CO., PLYMOUTH.

Notwithstanding the tediousness of the process, and the cost of labour to sow any considerable extent of land by dibbling, the practice has been for ages persevered in, as the most efficient; and as regards the expenditure of seed, by far the most economical; but it was found that even this advantage might be improved by a better method of regulating the "dropping" of the grain by those who followed the dibble: hence, various, and some very ingenious contrivances have been adopted to effect the uniform deposit of a smaller quantity; one of the best of which, we believe, was a "seed-dropping machine," invented by Mr. Bentall, of Heybridge, Essex, and exhibited by him at Shrewsbury last July; but the object of these being simply to economize the deposit, left the outlay for labour precisely where it was; the necessity to employ one or more to follow the dibble yet continued, and the consequent expense remained undiminished, whilst various irregularities still marked the incompleteness of the process. To remedy these obvious defects, the attention of several scientific agricultural mechanics have been directed to the construction of a simple self-depositing dibble: and the one, of which we this month present an engraving, is so well spoken of by those who have used it, that in recommending it, we feel the satisfaction arising from confidence in its real

value as an efficient aid to our farming friends. The inventor, Mr. Dingle, of Callington, Cornwall, is himself a practical farmer; and had for many years felt the inconveniences that resulted from the imperfect performance of one of the most important operations of the year, and very wisely set about devising a remedy, the result of which is the production of the machine in question. We give the inventor's description of it:—"The dibble is a hollow tube, composed of two semi-cylindrical portions, fitting together; the tube is open at its upper end and closed at its lower end, at the point, or toe, a hollow ferrule is fixed to one half of the divided tube, but detached from the other half, which is therefore at liberty to slide through it. This ferrule at the same time acts as a shield, and prevents the tube from filling with mould, and therefore cannot by any possibility get choked. A quantity of seed is contained in the large upper box, which by an ingenious contrivance supplies the receiving box with a regular quantity of seeds, which fall into the dibbling tube. The machine is manufactured to put in a single or double row at one operation."

The engraving represents the double machine, with which one man possessing little ingenuity will dibble from half to three quarters of an acre per day.

DINGLE'S HAND-DIBBLING MACHINE



AS SEEN IN OPERATION.

REMARKS ON THE AGRICULTURE OF ABERDEENSHIRE.

No. I.

PRELIMINARY OBSERVATIONS.

No branch of the statistics of the country has been so much neglected as that relating to agricultural pursuits. Great importance has uniformly been attached to such details by manufacturers and mercantile men, as constituting a guide to success in their respective avocations. But there is certainly no department of national industry, in connection with which, minute and accurate information of this kind is of such general importance, as the cultivation of the soil. Statistical facts when industriously collected and properly authenticated, must prove of incalculable benefit to agriculture, as illustrating its previous and existing condition in various districts, the results of the successive improvements which have been effected or introduced, the expenses attending, and the returns arising from the cultivation of different soils, and the amount of capital invested in and actually required for the prosecution of farming, besides affording the means of estimating the alimental resources of the kingdom. It is also abundantly obvious, that the possession of accurate agricultural statistics would be of immense advantage to government, as furnishing data upon which some beneficial legislative enactments might be founded, as well as for adjusting the relation between landlord and tenant on fair and equitable principles. Although the utility of collecting and comparing statistical facts and practical details, illustrative and descriptive of the modes of husbandry pursued in the more improved and advancing districts is now generally acknowledged; yet, as this subject has hitherto received but very inadequate attention, it will not, it is hoped, be deemed either irrelevant or improper, to advert here to a few of the more important advantages that seem likely to accrue from the careful consideration of such statements.

1. It is acknowledged by all, that there are certain quarters of the country in which agricultural improvement has made more rapid and extended progress than in others, and that amongst these there are some districts which, though perhaps deservedly famed for the judicious prosecution of one or more particular branches of husbandry, may, nevertheless, be considerably backward in other departments of it. Hence, it is highly probable that there are many features in the rural economy and general farm management of some localities, which, if made sufficiently known, would be ad-

vantageously introduced into and adopted in others where they do not at present exist; for there is, in fact, scarcely a district in the kingdom whose system of farming is so wretchedly defective as not to present some peculiarity of practice worthy of imitation elsewhere. Now, a correct knowledge of the practices of improved localities can only be acquired either by personal inspection at different periods of the year, or by means of impartial reports furnished by individuals who are intimately acquainted with their respective modes of husbandry. Although the former of these methods is, of course, the more expensive, yet it is obviously far more satisfactory than the latter, inasmuch as ocular evidence is invariably more convincing than the testimony of another; and certainly there are few ways in which an intelligent agriculturist could more profitably or agreeably spend a few weeks in summer (between turnip sowing and harvesting), than in visiting some of those parts of the island which are noted for superior cultivation. But though there can be no doubt that, in most cases, the time and money so expended would be amply compensated by the amount of valuable information thus obtained, yet, comparatively few farmers avail themselves of the opportunities such excursions afford of acquiring a knowledge of the agricultural practices of other quarters. The engrossing nature of the husbandman's avocations in many instances precludes his absenting himself for any length of time from the superintendence of his business; and for this among other reasons, which it is needless to specify, agriculturists as a body know less of each other's opinions and practices than is the case with other classes of the community, indeed, generally speaking, they may be said to be almost entirely unacquainted with any other system of management than that practised by themselves or by their immediate neighbours. It is therefore to be presumed that details of the modes of cultivation which are pursued in improved or improving districts, together with such statistical facts as may be correctly ascertained, can hardly fail to interest and instruct those who may happen to be either unable or unwilling to go to inspect and inquire for themselves, especially when accompanied, as they ought invariably to be, with information relating to the nature of the soil, the character of the climate, and other local circumstances, by which alone the pro-

priety of any system of husbandry can be estimated aright.

2. But much benefit may accrue even to the best cultivated localities themselves from the publication of their agricultural statistics and approved modes of management. It is generally admitted, that there is no district in the kingdom whose system of husbandry is so far advanced as not to be susceptible of still further improvement; indeed, the recent researches of scientific men have clearly established the inaccuracy of many principles of practical agriculture which had previously been regarded as fundamentally correct, and have discovered numerous defective points in the management of districts in which comparatively few were supposed to exist. Hence it seems reasonable to presume, that were the peculiar practices of different localities made more generally known than they are, the investigations of chemists would be more definitely and successfully directed towards the improvement and advancement of agriculture. Notwithstanding the cautious reluctance manifested by the majority of farmers to avail themselves of the discoveries or the aid of scientific men in the cultivation of their land, and the culpable pertinacity with which many of them still adhere to antiquated opinions and practices, intelligent agriculturists are becoming fully alive to the important assistance which the judicious application of science is so well calculated to afford them in the improvement of their art. The skilful chemist may, it is allowed, be competent enough to form and give a correct opinion regarding the propriety or impropriety of any agricultural process involving a knowledge of scientific principles; or he may be able to suggest improved methods of rearing and fattening live-stock, and to prescribe with confidence certain manures and certain modes of culture for such soils as have been subjected to chemical examination; but it is obvious he could perform these services to agriculture much more satisfactorily and correctly if furnished with such details as those to which I have adverted. Existing practices must, I apprehend, be thoroughly and maturely considered in connection with the nature of the soil, the character of the climate, and other local circumstances of the district in which they obtain, before the scientific man can, with any degree of confidence, either confirm their general propriety, or show wherein, and how far, they may be susceptible of improvement. It is evident, therefore, that while statistical and descriptive reports of improved districts may contain information relative to some peculiarities of practice which may be advantageously introduced into other localities less advanced in the path of improvement, they also undoubtedly furnish data for the establish-

ment of a correct system of husbandry, based upon those unchangeable laws of nature which science is gradually unfolding, or for the condemnation and abandonment of such empirical practices as have nothing but immemorial usage to recommend and support them.

3. There is another important and practical point of view in which we may consider the utility of collecting and diffusing correct information relative to the agricultural statistics and peculiar practices of different districts. It is not uncommon at present to contrast the systems of husbandry pursued in different parts of the country; and with the professed intention of illustrating the comparative inferiority in point of skill of the farmers of some of the contrasted localities, the relative produce of the cultivated land is generally adduced as the criterion of agricultural intelligence. Now, such comparisons of different districts are quite legitimate, and may possibly be productive of much benefit, in arousing some farmers to emulate the success of their more advanced brethren, when all the circumstances are fully and fairly detailed, such as the nature of the soil and climate, the kind and the duration of tenure (or the security afforded to the tenant), and the amount of capital possessed or invested by farmers generally in the cultivation of their land. But, on the other hand, when all these modifying particulars are not accurately stated and duly considered, such contrasts are apt to become invidious and mischievous, as tending to produce the impression, that the comparative backwardness of agriculture, and the deficiency of relative acreable produce in one district, result from combined ignorance and prejudice on the part of the tenantry. In all such cases, however, we should not for a moment overlook the adverse circumstances in which the alleged backward farmers may be placed, or the natural or social disadvantages with which they may have to contend, and which are probably either altogether unknown or but slightly felt in the more advanced and prosperous localities. How frequently, for example, do we find a certain class of tourists levelling the most sweeping condemnation against the modes of farming practised in particular counties of England, and bestowing unmeasured censure on the farmers for not adopting the peculiar practices of the Lothians, Berwickshire, and other improved Scotch counties, without, however, pausing to consider the dissimilar circumstances in which those different parts of the island are placed. Statements of produce and profits are also not unfrequently adduced in support of such arguments; but being mostly derived from a few isolated cases, they are generally far above the average, and thus tend only to misinform and

mislead. There cannot be the smallest doubt that much of the husbandry of the last named districts may be successfully introduced into most parts of England, while some of the peculiar practices of the latter country may, no doubt, be adopted with equal advantage north of the Tweed; and further, it must be confessed that many English agriculturists are in a great degree inexcusable for their long adherence to popular opinions and practices, after their impropriety has been clearly demonstrated by experience in other quarters. Nevertheless it would, I think, be exceedingly erroneous to attribute the comparatively defective condition of agriculture in certain parts of England, exclusively to lack of skill among the farmers. It must be remembered that many favourable circumstances have conspired to raise the agriculture of Scotland to the proud and distinguished position which it now confessedly occupies; the principal of which has undoubtedly been the granting, at an early period, of leases unincumbered with burdensome obligations, or with useless or mischievous restrictions. Thus while Scottish agriculture, under a well regulated system of leasehold tenure, aided by the liberal encouragement of the landed proprietary, and the very general establishment of grain-rents had been making rapid and lengthened strides towards its present condition, that of England and of Ireland, on the other hand, may be said to have remained almost stationary, or at least to have been but very slowly progressing, under circumstances far less equitable and encouraging, if not directly the reverse of those to which the acknowledged superiority of Scottish husbandry is mainly attributable.

Although there are certain fundamental principles of agriculture which may be said to be of universal application, yet, in general, a judicious system of farming is dependent upon a variety of local circumstances; and the particular practices which it may be most advisable to adopt in one district may be wholly unsuited to another dissimilarly circumstanced in regard to soil, climate, &c. It is obvious therefore that before we can fairly contrast the agriculture or the acreable produce of different parts of the country, we must be in possession of accurate information respecting the nature of the soil of which they respectively consist, the character of the climate to which they are subject, with the other particulars above alluded to. When all these circumstances are duly considered, and their influence rightly understood, it will, I have no doubt, be acknowledged that the average produce of the soil in any particular district furnishes by itself no absolute criterion of the judgment of the farmers who cultivate it. It requires, for instance, more skilful management to raise five quarters of oats or

twenty tons of turnips per acre in certain parts of Aberdeenshire, than need be exercised to grow eight quarters of oats or thirty tons of turnips either in Norfolk or in East Lothian, where the soil and climate are so much superior. Hence it seems but reasonable to presume that the comparative deficiency of acreable produce in one of two contrasted localities is to be ascribed not so much to the want of skill on the part of its farmers (though this of course is not to be overlooked) as to the more unfavourable circumstances in which they are placed, and over which they possess but little or no controul. Were we in possession of detailed reports of the practices and statistics of different districts whose soils and climate are described, no difficulty could be experienced in contrasting the results of their respective modes of farming, or in deciding with some degree of accuracy which is most skilfully cultivated under the particular circumstances of each.

The foregoing are only a few of the principal advantages that seem likely to accrue from the collection and diffusion of correct information relating to the agricultural statistics and peculiar practices of improved districts. There are obviously several other benefits of greater or less importance to be derived from such details, both by the practical farmer and the political economist; but it is unnecessary to occupy more space by referring to these, as I have already, I think, sufficiently proved the utility of agricultural statistics in other respects to farmers and all interested in the improvement of husbandry and the prosperity of their native land. But notwithstanding the great importance of such statements, it is needless to remark that their collection has not kept pace with the rapid advances which have latterly been made in the path of improvement. The value of such information has no doubt been recognised by the Royal Agricultural Society of England, under whose auspices interesting reports of such English counties as present some peculiarities in their modes of farming, are now in course of being drawn up. In Scotland, however, very little has been effected in this way since the publication of the voluminous reports furnished to the Board of Agriculture. Occasionally, indeed, brief and hasty accounts of the farming of certain districts have appeared in the newspapers and agricultural periodicals, from the pens of tourists and others; but, with some few exceptions, these have been much too general and superficial to be of any practical value to the farmers of other parts of the kingdom.* The princi-

* Some interesting and instructive sketches of the agriculture of certain localities, by Professor Johnston, have lately been published in the "Quarterly Journal of Agriculture;" but the learned writer does not enter minutely into details of practice.

pal work of a statistical nature which has issued from the Scottish press, since the publication of the county reports, is that entitled the "New Statistical Account of Scotland," by the ministers of the respective parishes, which undoubtedly constitutes a valuable contribution to the statistics of the country; but as it embraces numerous topics in limited space, the department of agriculture is in most instances very briefly noticed; indeed the writers do not profess to give anything like a detailed account of the present state of farming in their respective parishes. It is well known, however, that very great and important improvements have been effected in every branch of Scottish husbandry since the publication of the county surveys, drawn up under the direction of the Board of Agriculture, so that these reports are now in many respects quite inapplicable to the existing condition of agriculture in any part of the country. It would, therefore, I think, be an object well worthy the attention and patronage of the Highland and Agricultural Society to procure correct statistics and reports of the present state of agriculture in the different Scotch counties. The Society, by doing so, would supply a great desideratum, and obtain much useful information on various branches of husbandry; and the agriculturists of England and of Ireland would thus be put in possession of authentic details, whereby they would be enabled to judge for themselves how far the Scotch methods of farming are superior or inferior to their own; while the ignorance and misapprehension which generally prevail south of the Tweed regarding the practices of the north, would thereby in a great degree be removed, and a better understanding established between the farmers of both countries, which would doubtless redound to their mutual advantage.

It is not, I think, saying too much, that there are few counties (if any) in Scotland which have made greater progress in agricultural improvement since the publication of the surveys alluded to than Aberdeenshire. At that period the husbandry of this county was in a very backward condition indeed. All operations on the soil were very imperfectly and expensively performed (owing, in a great degree, to the want of efficient implements); the live-stock, now so much improved in symmetry and in size, were then comparatively small, and badly maintained during the winter months, on account of the limited extent of land under turnips, and the miserable crops with which the farmers of those days were content; and thorough draining was altogether unknown and unpractised. Modern improvements were, however, already beginning to appear, though such instances were "few and far between;" old prejudices were also, it appears, beginning to wear away with the

demise of the good old men who entertained them, and everything seemed to augur a more improved state of things at no distant period. The reign of high prices consequent on the French revolutionary wars tended most materially to accelerate the consummation of so desirable an object; and there is perhaps no other district in Britain in which greater improvements have been so speedily and successfully accomplished, notwithstanding the natural disadvantages of a rugged soil and an uncertain, changeable climate. The principal of these, it might be proper to mention, are the extension of thorough draining, whereby the productive capabilities of the soil and the salubrity of the climate have been simultaneously increased—the general adoption of alternate husbandry, and the cultivation of green crops on an extensive scale—the formation of excellent turnpike roads—the planting of large tracts of waste ground with larch, Scotch fir, and other suitable trees, the substitution of the improved two-horse swing plough for a clumsy, cumbrous thing of the same name, which was dragged slowly along by a formidable team of from six to twelve oxen; of the threshing machine for the flail, and of the scythe for the sickle in reaping grain-crops, the granting of leases on more equitable terms for the tenant, the erection of commodious and substantial farm buildings, the enclosing and reclaiming of waste lands; the introduction of bone-dust, guano, and other portable manures, &c., &c.

The Survey of Aberdeenshire, which was drawn up for the Board of Agriculture by the late Dr. Skene Keith, is very voluminous; and being the production of a man well acquainted with the principles and practice of agriculture as then known, it was justly esteemed as among the most complete and valuable reports furnished to the Board. It is needless, however, to remark that it presents but a very imperfect and erroneous view of the existing state of farming in Aberdeenshire; and considering the important improvements which have latterly been effected, as well as those that are still progressing in the county, it has occurred to me that a few papers descriptive of the present condition of its agriculture, and detailing such statistical facts as I may be able to ascertain, might prove interesting if not instructive to the southern readers of this Magazine. I may state at the outset, that while adverting in detail to whatever practice appears to me as worthy of being generally known, I shall not attempt, as is sometimes done, to hold up the agriculture of Scotland as a faultless model for English farmers. From personal observation in the most improved districts north of the Tweed, I am satisfied that however far advanced the agriculturists of Scotland may consider themselves to be, they have still much, very much to

learn in the best and noblest of all arts—that of developing the capabilities of the soil to the fullest extent. I am therefore quite prepared to admit that Aberdeenshire farming is still defective in many particulars, and that its enterprising agriculturists may take some useful lessons from the practices of other districts; but it is equally unquestionable (and I hope to prove so bye and bye) that those of other parts of the kingdom may derive some valuable hints from the methods of cultivation at present pursued, and the improvements now progressing in this county. In my subsequent remarks I shall take the liberty of adverting to whatever appears to me as being injudicious in the husbandry and rural economy of Aberdeenshire; but at the same time I think it right to state that my constant aim shall be to furnish facts and details of practice, leaving it for the intelligent reader to draw his own conclusions.

SITUATION, EXTENT, &c.—Having premised these general observations, it may be proper to make a few remarks relative to the situation, extent, boundaries, &c., of the county, before proceeding to advert to the nature of the soil and other practical details. Aberdeenshire is situated between $56^{\circ} 52'$ and $57^{\circ} 42'$ of north latitude, and between $1^{\circ} 49'$ and $3^{\circ} 48'$ of west longitude. It is the fifth Scotch county in point of size, being somewhat smaller than Inverness, Ross, Argyll, and Perth, but larger than any of the other counties. It is also more extensive than any of the English counties except three, namely, Yorkshire, Devonshire, and Lincolnshire. The county of Aberdeen is computed to contain about one-fifteenth part of the whole area of Scotland, or one-fiftieth of that of Great Britain. Its greatest length is eighty-six miles, and its greatest breadth forty-two miles.

Aberdeenshire is bounded on the north-east and east by the German Ocean; on the south-east and south by the counties of Kincardine, Forfar, and Perth; on the south-west by Inverness and Banff; on the west and north-west by the latter county. Having upwards of sixty miles of sea-coast on the one side, and the broad Atlantic not being far distant from the other, this county enjoys, as will hereafter be more particularly noticed, a milder climate than could be expected from its high latitude and mountainous character. According to the most recent admeasurement, it contains an area of 1985 square miles, or 1,270,400 acres English statute measure, which are equivalent to 1,007,308 Scottish acres.* About 300,000 imperial acres are arable,

* It is proper to mention here that one Scotch acre is equal to one acre, one rood, one pole, and twenty-four yards, or 1.261183 acres English statute measure. The common proportion of four Scotch acres being equal to

450,000 acres uncultivated, and 520,400 acres unprofitable.

DIVISIONS.—Aberdeenshire is divided into five districts or divisions, named Mar, Formartin, Buchan, Garioch, and Strathbogie, which differ from each other in many respects. As I shall have occasion frequently to refer to these localities when noticing the different modes of cropping, &c., it is proper, before proceeding farther, to make a few remarks descriptive of each, beginning with

Mar.—This division is by far the largest; it contains at least two-thirds of the whole county. It comprehends the extensive district of country included between the Dee and the Don, besides a very considerable tract situated on the south side of the former river, and between it and the Grampian range, which separates Aberdeenshire from the neighbouring counties of Kincardine, Forfar, and Perth. But although Mar is the largest and most southerly, it is upon the whole the most barren, bleak, and mountainous division of the county. It contains only about two miles of sea-coast between the mouths of the rivers Dee and Don, and few of the hills, even in the lower part, are of less altitude than 500 feet, while many of the mountains in Braemar (or the highest grounds of Mar) are upwards of 3500 feet above the level of the sea. This division contains the mountains of Benmackdhui, Lochnagar, and Cairntoul; the former of which, according to the latest surveys, is no less than 4390 feet above the level of the sea, being twenty feet higher than Ben Nevis, near Fort William, which until very recently was considered to be the highest mountain in Great Britain. In the middle part of this extensive division there are, however, several highly fertile and picturesque valleys, among which may be mentioned the vales of Alford, Cromar, Kildrumy, &c., as being the most valuable and productive parts of the county. Grain of the finest quality is abundantly raised, in favourable seasons, in these beautiful dales or “hows” as they are provincially termed. The lower subdivision of Mar includes New and Old Aberdeen, the former situated on the Dee and the latter on the Don. It appears from history that the most of this part was at one period covered with natural wood, and vestiges of the trees are still frequently discovered in bogs. The least rugged and barren portions have been reclaimed and cultivated at great expense by the inhabitants, through whose unexampled industry and perseverance much of what was once a vast forest, or a mere inhospitable waste, has been converted into good pasture-land

five English is therefore inaccurate, the nearest approximation being forty-eight Scotch to sixty-one imperial acres.

and fruitful corn-fields. Braemar still abounds with large natural forests of excellent timber, which is much esteemed for its durability. These woods are being considerably thinned at present for railway and other purposes. In such elevated situations the planting of suitable trees ultimately affords a better return than could be derived either from grazing or cultivation.

The second division of Aberdeenshire is denominated *Formartin*, the greater portion of which is included between the rivers Don and Ythan; the former separating it from Mar and the latter from Buchan. It extends from the sea-coast to a considerable distance inland, and contains a great diversity of soils, from the light drifting sand on the beach to stiff, tenaceous clay. The interior of this division is very hilly, and in many places quite unproductive; but towards the German ocean the ground becomes flat, and generally speaking of good quality, though susceptible of great improvement by means of thorough draining and the application of calcareous manures. Though there are in the inland parts considerable tracts of peat-moss, moor, and heathland, yet the division of Formartin abounds with excellent and well cultivated farms, particularly near the sea-coast; and in the parishes of Udney, Tarves, Fyvie, and Auchterless, where important improvements have recently been effected. It gives the title of viscount to the Earl of Aberdeen, who is the principal proprietor.

The third, and perhaps the most valuable division of the county is called *Buchan*. Though inferior to Mar in point of area, it is considerably superior to it in agricultural importance, the soil and climate being much more favourable for the prosecution of farming. This division possesses about forty miles of sea-coast, and the surface is in general flat and free from hills, excepting on the north-west where it adjoins with Formartin. Owing in a great degree to its level surface and proximity to the German Ocean, this important district possesses facilities for agricultural enterprise which no other division of Aberdeenshire enjoys to the same extent; and in general its cultivation is prosecuted with spirit and success. Adjoining Formartin on the north-west, there are, however, several heath-clad hills, besides considerable tracts of peat-moss interspersed through the interior, a good deal of which seems to be susceptible of profitable reclamation. Some parts of the coast are very flat and much subject to boisterous blasts from the sea; but in other respects the climate is comparatively mild and agreeable. The farms are in general of considerable size; indeed many of them are apparently too extensive for the capital at the command of their present occupiers. The soil in the vicinity of Ellon and some other towns is loamy and very produc-

tive; but the greater portion of this division, consists of tenaceous clay, which stands greatly in need of furrow-draining.

The fourth division of Aberdeenshire is named the *Garioch*. It is bounded by Mar on the south and west, by Formartin on the east and north-east, and by Strathbogie on the west and north-west. This division is naturally the most fertile and productive in the whole county; and while presenting for the most part a flat, or slightly undulating surface, it enjoys the advantage of being sheltered on all sides from the severe blasts of winter, by high bounding hills, one of which called Benochie is 1670 feet above the level of the sea. But since the introduction of thorough draining, and the employment of bone-dust and other manures in turnip husbandry, particular parts of the divisions of Mar, Formartin, and Buchan, which are more contiguous to the coast, have, it is considered, surpassed the Garioch in the progress of improvement. This division has, however, derived great benefit from the opening, in 1807, of a canal from Aberdeen to Inverury, which affords a convenient and economical mode of transporting its surplus produce to the Aberdeen market, while at the same time facilitating the importation of lime, bone-dust, and other extraneous manures; but this canal is now proposed to be displaced and superseded by a projected line of railway between Aberdeen and Inverness, which it is expected will be of still greater advantage to the district. This division possesses in general a flat or undulating surface, and constitutes a sort of extensive valley enclosed by lofty hills. The soil, as already observed, is naturally fertile, producing grain of excellent quality, and the farms are of medium extent, except in the immediate vicinity of Inverury, Old Meldrum, and Kintore, where there are a great number of small holdings, denominated "crofts," to which I shall hereafter more particularly advert.

The fifth and last division of the county of Aberdeen is denominated *Strathbogie*. It is separated from Banffshire by the rivers Isla and Deveron on the north and east, and by its bounding hills from Mar, Garioch, and Formartin. As the greater portion of this division is mountainous, and as the situation and elevation of the numerous bogs and extensive moors preclude any reasonable chance of their profitable reclamation, it is allowed to be the least favourable for agriculture, and hence the least valuable part of the county. There is, however, some very excellent and productive land in the immediate neighbourhood of Huntly, which is the principal town, and a great deal more susceptible of much improvement by means of thorough draining and a liberal application of lime. Owing to the distance from Aberdeen or any other large town;

and the want of good roads (which was at one time greatly felt), the Strathbogie farmers had neither inducement nor facilities to begin the improvement of their land at so early a date as those of the lower parts of the county; and hence it is only within a comparatively recent period that the hand of improvement may be said to have become distinctly visible. The farmers are, however, generally speaking, most industrious and anxious to practise every improved method of cultivation which their means will enable them to adopt; and it is but justice to state, that considerable encouragement is given to his numerous tenantry by the Duke of Richmond, who is the principal proprietor in this part of Aberdeenshire. The crops commonly cultivated in Strathbogie, are oats, potatoes, and turnips. Flax was at one period extensively grown for the supply of a linen manufactory which was established at Huntly, and continued to flourish for a considerable length of time; but both the manufacture and the production of this crop have been abandoned for a number of years past, to the serious loss of the district, as flax proved a most remunerating crop for the farmers, besides affording much useful employment to the labouring classes.

From the foregoing brief and very general description of the several districts into which Aberdeenshire is commonly divided, some idea may be formed of the topographical character and more prominent features of the whole county. It will be seen that it presents every variety of surface. It is not deemed necessary to notice, or even enumerate, in this place, the ecclesiastical or other divisions which have been adopted in modern times, as those already adverted to, though now almost obsolete, will be found more convenient for referring to the different parts of the county where particular practices are pursued. I shall now proceed to advert to the nature and qualities of the different soils of which Aberdeenshire consists, and the character of the climate to which it is subject, as it is on these conditions that the productive capabilities and resources of any district mainly depend, and a proper consideration of their joint influence constitutes the only accurate guide in determining the most judicious or profitable system of husbandry to adopt; besides it is abundantly obvious that the propriety or impropriety of any particular method of cultivation can be rightly estimated only in connection with the nature of the soil and climate of the district in which it is pursued. To furnish details, then, of even the most approved modes of husbandry, unaccompanied with information connected with the soil and climate of the particular localities in which they are represented

as being successfully adopted, would not, I apprehend, be of much practical utility to the agriculturists of other quarters. Such a course, would in fact, be equally useless and reprehensible with the practice of confidently recommending the introduction of new modes of management into certain districts, irrespective of the nature of the soil or the character of the climate, which should in no case be overlooked in treating of the details of agriculture. A judicious system of farming is dependent on a variety of local circumstances; it is obvious, therefore, that until the principal of these have been explained to, and are fully comprehended by the farmer, he will be incompetent to form an accurate opinion respecting the merits or demerits of the practices described.

SOILS.—The general topographical appearance of Aberdeenshire has been already noticed; and it is obvious that the soil of a county whose surface is so much diversified with mountain and glen, hill and dale, must vary very much in character and quality. Accordingly there is no description of soil, from peat-moss and drift sand to stiff tenacious clay, that may not be met with in this county. Although the surface is in general hilly, rising in some places into lofty mountains, yet there are extensive tracts of level and low-lying land in different parts, particularly in the divisions of Buchan, Garioch, and Formartin, besides several productive vales in Mar. In adverting to the different kinds of soils which are commonly met with throughout Aberdeenshire, I shall, for the sake of perspicuity, follow the foregoing divisions of the county, beginning, as before, with that of Mar.*

The soil of this extensive district of country is very various in texture and quality. The land in a few places is of a clayey nature; but for the most part, it consists of sand or gravel incumbent on an open or porous gravelly bottom—sometimes also on a clayey subsoil. In many places the soil assumes the character of a sandy loam, which, in suitable seasons (neither too moist nor dry) is considerably productive. The fertile vales of Alford, Cromar, and Kildrumy, contain a good deal of land of this description, and in those places excellent crops of every kind are produced. This sort of soil is found eminently adapted for the growth of turnips, potatoes, oats, and bear; indeed, in the parish of Aboyne, the latter grain has been grown last season (which was by no means a favourable one for ripening corn in upland districts) to the weight of fifty-four pounds per imperial bushel. On the banks of the Dee there is a

* This very large division is subdivided into the districts of Braemar, Cromar, and Strathdee.

good deal of sandy soil, which approaches, in many places, to the nature of a sandy loam of greater or less fertility; and along the Don (the other bounding river), are some very fertile "haughs," consisting, of deep alluvial soil. The land on both sides of this river is occasionally flooded during the summer and autumn months; and as the haughs are, for the most part, in pasturage, their inundation proves more or less injurious to the grass for some time, and almost invariably destructive to any grain crops that are attempted to be grown. After much rain, this river, which is fed by numerous tributary streams, vernacularly called "burns," acquires in some parts of its course an irresistible impetuosity; and overflowing or tumbling down its banks, sweeps away any corn-stooks, hay-ricks, &c., that may happen to be within its reach; while all flat land that has been submerged is more or less injured by the detritus.

Mar contains comparatively little clay, and where any does exist, it is generally intermixed with small stones derived chiefly from the decomposition of granite. In the lower part of this very extensive division, there is a considerable extent of good arable land, approaching, in many places, to the nature and fertility of loam, which had originally been reclaimed from a state of nature, and brought to its present productive condition by the industry and skill of the inhabitants. As has been already observed, the whole or greater portion of this tract was at one period a vast natural forest, and a good deal of it is still covered with heath; but the extent of moor is annually diminishing before the progress of improvement. The manner of reclaiming waste land, which is generally adopted in this county, is that of trenching with the spade and mattock; which is certainly a most effective though a very expensive method, owing, in a great degree, to the immense number of large, irregular stones, called "boulders" existing beneath, and protruding through the surface of the ground, and which often require to be blasted with gunpowder preparatory to their removal. As the trenching and reclaiming of heath-land is now in general operation in all parts of Aberdeenshire, I shall have occasion more particularly to advert to the practice in a subsequent paper. Mar abounds with peat-moss, of which the inhabitants manufacture fuel; and in Braemar, there are very extensive tracts of heath and mountain land, which, in consequence chiefly of their high altitude, afford no reasonable chance of being profitably reclaimed.

In Formartin, also, the soil is very various in character and quality. In the vicinity of the sea-coast, it consists chiefly of clay, incumbent on an indurated gravelly or clayey substratum; but a considerable proportion of peat-moss is inter-

spersed through the inland parts of this division, besides a large extent of thin moorish land which still remains unreclaimed and uncultivated. There is, however, some excellent strong loam in the division of Formartin, which is in general well cultivated, and remarkably fertile and productive. It is chiefly of a brownish colour; but in those parts which have long been tilled and manured, it is black. The subsoil is for the most part a diluvial deposit of clay; but in some places the subjacent granite protrudes through the surface. A very large proportion of the soil of this division of Aberdeenshire rests upon an indurated stratum of ferruginous gravel, provincially designated by the appellation "pan," which is of extreme hardness, and requires the most vigorous exercise of the spade and mattock to penetrate it. Whenever the substratum consists of this ferruginous incrustation, the surface soil is naturally very wet, cold, and unproductive in consequence of rain-water being prevented from sinking through the *moor-band* as it is likewise termed. The only effectual and permanent remedy in this case consists in thorough draining and subsoil ploughing, whereby the ferruginous pan is loosened, and the surface-water enabled to percolate freely into the drains provided for its reception and escape. The process of trenching already referred to is sometimes resorted to on arable land of this description for the two-fold object of breaking the pan, and of getting rid of the immense stones or "boulders" as they are called, which in many places constitute a most formidable obstacle to the action of the plough. The operation of draining is often simultaneously performed, and the stones taken up in the course of the trenching are conveniently used in filling the drains, enclosing, &c. But where such boulders do not exist within eighteen inches or thereabouts of the surface of the ground, the subsoil-plough appears to be peculiarly adapted for breaking and loosening the bottom, and may be advantageously substituted for the spade; not merely on account of being considerably less expensive, but because in the operation of subsoil ploughing the substratum or pan is thoroughly broken (though not without great labour), but not brought to the surface or intermixed with the upper soil; whereas in the case of trenching, the under soil is brought to the top, and the surface buried beneath it. Where large stones do not exist near the surface, the subsoil plough is now, therefore, employed to a considerable extent, and invariably with the most beneficial results, provided the operation be preceded by thorough draining. Although it has been abundantly demonstrated by experience that the one is a necessary accompaniment to the other, yet not a

few agriculturists have fallen into the error of supposing that subsoil-ploughing is of itself capable of rendering wet land of this description sufficiently dry. But a little consideration may suffice to convince any practical man of the impossibility of attaining this desirable object by means of subsoil ploughing alone; for although this operation may impart a degree of temporary porosity to the indurated substratum, so as to admit for a brief period, the descent of water, yet without under-drains to receive and convey it off, it is obvious that the land cannot be rendered perfectly or permanently dry; the subsoil, however well loosened it may have been, must in a comparatively short time relapse into its original impervious condition. Neither can thorough draining on such land be productive of any thing approaching its maximum benefit, unless succeeded by subsoil ploughing or other deep tillage to loosen the pan, and thereby enable the water freely to percolate into the drains. Moreover, as any excess of moisture is thus prevented from accumulating in the subsoil and about the roots of the plants, (which without drainage it would certainly do,) the degree of porosity first imparted to it will be in a great measure maintained by the continual percolation of water into the drains, aided by the action of the atmospheric air which follows in its track, and materially tends to meliorate the most obdurate subsoils.

In the division of Buchan, there is a considerable extent of adhesive clay, which is most difficult and precarious to cultivate in moist seasons, owing partly to the nature of the soil itself, and partly to the great want of drainage observable throughout Buchan; though it is proper at the same time to remark, that many proprietors and agriculturists are at length vigorously setting about the accomplishment of this primary operation. The clay in some parts of Buchan is remarkably pure and free from admixture of sand; indeed, in point of tenacity it is little inferior to the clay soils of the Lothians, though by no means so productive as they are, owing to the superior climate of the latter district. In some places this soil rests on a porous bottom; but in general it is incumbent on a bed of ferruginous gravel, or on one composed of indurated clay. Hence the great necessity that exists for drainage. The alternations of frost and thaw, during the winter and early spring months, exert a very powerful influence in meliorating this description of land; so much so, that, notwithstanding its adhesiveness, it crumbles down into a powdery state after being exposed for some time to the action of the weather. When saturated with moisture, it feels quite soft and unctuous to the touch; but does not adhere so much

to the plough in wet weather as the clay of some other districts, and is in general less difficult to pulverize and prepare for green crops, as it rarely acquires that almost impenetrable hardness, on exposure to drought, which constitutes one of the characteristic disadvantages of tenacious clays. Wherever thorough draining has been resorted to, and lime and other manures have been liberally applied, this soil produces very good crops of grain, potatoes, and turnips; but, as already remarked, very much still remains to be done in the way of draining, without which, indeed, in this high latitude and comparatively humid climate, clay land, resting on an impervious bottom, is of little agricultural value. As a candid reporter, I must observe further, that many of the Buchan farmers, in ploughing their land, seem rather negligent of the advantage of imparting a uniform and sufficient degree of curvature to the ridges. The neglect of this precaution occasions the stagnation of surface-water, with all its injurious consequences, on certain parts of fields, while, if proper attention were bestowed on the rounding and acclivating of the ridges at the time of ploughing, this evil would be in a great degree averted. Although thorough draining is unquestionably the radical cure for all wet retentive land, yet it is obvious that the deteriorating effects of overwetness may be considerably mitigated by the partial relief afforded by narrow ridges, elevated at the crown or centre, and uniformly rounded, as well as by forming open furrows through all the hollow parts, for the purpose of facilitating the escape of surface-water. This is now duly attended to by most farmers, but there are still many exceptions.

In several parts of Buchan the clay is incumbent on a thick bed of shelly sand, which, while it affords proof that the district was at one period submerged beneath the waters of the German Ocean, has been found of considerable value as a top-dressing for the surface soil. Much of the clay is impregnated with a proportion of oxide of iron, which drainage and the application of lime can alone correct and neutralize. Besides what may properly be denominated adhesive clay, which extends almost uninterruptedly from Aberdeen northwards at a short distance from the coast, there is in this division a considerable proportion of friable clayey loam, of excellent quality, and highly productive. There is also a good deal of peat moss, which furnishes fuel for the inhabitants, and large tracts of heath and thin moorish land on the confines of Formartin. A large portion of these now valueless wastes is undoubtedly susceptible of profitable reclamation, a fact which has been practically demonstrated by the successful improvements that have recently

been effected in that quarter. Limestone is found in different places; but, owing to the scarcity of fuel, very little of it is employed by the farmers. A very large quantity of lime is, however, annually imported into Buchan from Sunderland; its application has been found eminently useful on dry land, though, of course, less beneficial on the wet clays, with which this division abounds.

The Garioch contains less unproductive land (if we exclude the large bogs on the sides of its bounding hills) than any other division of the county in proportion to its extent. This district having been under good cultivation from a remote period, is naturally very fertile; so much so, that it has been called the granary of Aberdeen. Upwards of one-half of the extensive valley of Garioch (for such it may be denominated) consists of light friable loam, which is found eminently adapted for turnip husbandry. A considerable tract appears to have originally been stiff clay, derived most probably from materials carried down from the slate hills, which constitute a portion of the boundary; but through the joint influence of long-continued cultivation, and the application of farm-yard manure, it has been converted to its present state of a clay loam of very considerable fertility. The subsoil is principally composed of sand, and is quite permeable to rain-water. No limestone has been discovered in this division. The moorish and boggy tracts are almost exclusively confined to the bounding hills, some of which, as already observed, are of considerable altitude. The few peat mosses, which were formerly interspersed through the low grounds, have either been exhausted for the purpose of fuel or reclaimed for the production of corn. This highly cultivated valley presents a most pleasing appearance when viewed immediately before harvest from the summit of Benochie, near Inverury.

In the division of Strathbogie there is less arable land in proportion to its extent than in any other district of the county, Mar perhaps excepted. Barren sand, peat moss, and moorish soil, or heath land, predominate in the hills; clay is also found in some places, occasionally pure, similar to that of Buchan, but commonly intermixed with gravel and small granite stones in different stages of decomposition. There is, however, a considerable proportion of excellent light clay, inclining to the nature of loam, in the vicinity of Huntly, and also on the banks of the rivers Devernon, Isla, and Bogie. The existence in this division of limestone of excellent quality has been productive of much advantage to the farmers, in the improvement of their land; though it is to be regretted that the want of coal prevents them from using this valuable fossil to the extent which its usefulness would warrant. A good

deal of waste ground in the hilly and low lying parts of this division has been planted with Scotch fir, larch, and other suitable trees; and these plantations, which are for the most part in a thriving condition, contribute in no small degree to the improvement of the climate, besides relieving the otherwise bleak and rugged appearance of the district. The subsoil in many places consists of a hard tilly clay, impervious to water, and which thorough-draining and subsoil-ploughing alone can rectify. This division, like Formartin, abounds with indurated ferruginous deposit called "moor-band pan," to which I have already adverted. The distance from the coast, the elevation above the level of the sea, and the very changeable character of the climate, in a great degree preclude the profitable cultivation of extensive tracts of waste land, which, had they been lower situated, might be reclaimed and rendered comparatively productive.

From the preceding observations the reader cannot fail to perceive that the soil of Aberdeenshire is exceedingly various in character and quality indeed. There is, first, the strong adhesive clay in Buchan and in some parts of Formartin; the gravelly and sandy loams in Mar; the friable, clayey loam in the Garioch; and the peat mosses, moor, and heath-land, of which the upland parts of the county principally consist, and with which the low grounds also more or less abound; besides light sandy "links" in the vicinity of Aberdeen, and generally along the coast. This great diversity in the nature and quality of the soil necessarily gives rise to different modes of farm management: in fact, each division exhibits some peculiarity in its system of cultivation, dependent on the character of the soil and other local circumstances. These peculiarities will be adverted to in due course; and I shall also, in a subsequent paper, furnish a statement of the average produce, rent, &c., of the different kinds of cultivated land throughout the county.

But notwithstanding this diversity in the nature and productive capabilities of the soil of Aberdeenshire, the whole (except what is absolutely barren and mountainous) is familiarly divided into two descriptions of land, denominated "infield" and "outfield." Most farms contain a proportion of both within their boundaries, though the extent of the latter is annually diminishing. As these distinctive appellations shall hereafter be occasionally referred to, it is necessary, before proceeding further, to explain their signification. In the old system of agriculture, it was customary to have a certain proportion of the farm contiguous to the farm-buildings always in grain-crop, potatoes, &c., to which the whole of the dung was applied. The remainder of the farm was arranged into a certain

number of divisions, each of which bore four or five crops of oats in succession, and was then left uncultivated for four or five years, to "rest" and produce such herbage and weeds as might naturally grow. Hence the former received the name of "infield," the latter that of "outfield." The infield land being the part exclusively cultivated in a regular manner, has acquired a rich blackish colour, from the continued application of farm-yard manure and the decomposition of vegetable matters. It is generally a sandy or a light clayey loam; and, in consequence of the long-continued course of tillage to which it has been subjected, is of a very soft and incoherent texture, and exceedingly productive of weeds. The *Spergula arvensis* (spurry), provincially called *yarr*, is peculiarly prevalent in corn fields, and often proves highly prejudicial to the crop. The *Arrhenatherum avenaceum* (oat-like, or knot-grass) is also very common and difficult to extirpate. The "infield" ground is, however, very fertile, particularly in the vicinity of the towns and villages, and, when judiciously managed, produces grain and roots in abundance, and of excellent quality. The "outfield" land (which is naturally of inferior quality, and kept so by neglect) is chiefly appropriated to the grazing of black cattle and sheep; but it is occasionally broken up, one or two grain crops taken, and again laid down to permanent pasture.

As the nature and productive powers of soils are dependent in a greater or less degree on the character and composition of rock on which they are incumbent, and by the disintegration of which they have been gradually formed, it would be an unpardonable omission not to notice under this head the principal rocks and mineral productions of Aberdeenshire. It is generally known that the rocks of this county, and, indeed, of the greater proportion of the north of Scotland, are chiefly of the primitive kind, granite being predominant; and of this mineral Aberdeenshire possesses an inexhaustible supply. It abounds in almost all parts of the county, particularly in the divisions of Mar, Formartin, and the lower part of Buchan. There are extensive quarries in these and other places, at which the granite is prepared for the erection of buildings within the county, or for exportation. It is not, however, confined to the hills, or to places at which it may be quarried for architectural purposes, but is interspersed through much of the arable and most of the uncultivated lowlands in the form of irregular, and detached masses, provincially called "boulders," which, in consequence of their proximity to the surface (through which, indeed, they often protrude) constitute a very formidable obstacle to tillage, and require much labour and expense to effect their removal. The purest quality

of granite is found in the vicinity of Peterhead, whence it is extensively exported to different parts of the United Kingdom, for the construction of public buildings, bridges, docks, pillars, pedestals, &c. Most of it contains a very large proportion of felspar in its composition; it is, in consequence, of a reddish colour, and admits of being finely polished. The granite in the neighbourhood of Aberdeen is of a greyish colour, contains considerably less felspar and more quartz than that of Peterhead, and constitutes an excellent material for buildings of every description.* It forms, also, a very durable street-pavement, for which purpose large quantities of it are annually shipped for London. The new streets and public buildings in Aberdeen, which are all constructed of this kind of granite, are noted for their permanently elegant appearance, and the newly erected farm-buildings throughout the county are likewise both handsome and substantial.

The mountain limestone abounds in certain parts of Buchan and Formartin; but, owing to the scarcity of proper fuel, its calcination cannot be extensively or profitably undertaken by the farmers. The greater portion of the lime employed in these divisions is, therefore, imported at very considerable expense from Sunderland. Limestone of good quality is found in Strathbogie, where its use has been productive of the greatest benefit to agriculture; and also in the parish of Strathdon, in Mar, where almost every farm has its own lime-kiln. Coal is not found in any part of Aberdeenshire. Slate is obtained at Foudland, one of the bounding hills of the Garioch, and is now much employed for roofing agricultural buildings.

Trap, gneiss, hornblende, syenite, greywacke, mica-slate, and sandstone, also exist in small quantity, or detached blocks, in different parts of the county; but as these exert little influence on the general character of the soil, they need not be further adverted to in this place. Granite being by far the most prevalent rock in almost every district north of the Grampians, there is but little variety to interest the geologist. Lead and manganese exist in a few places; and the Alpine region of Braemar contains precious stones of various denominations, but commonly designated "Cairn gorums," from the name of the mountain in which they mostly are found. T. S.

(To be continued.)

* As felspar is by far the most decomposable constituent of granite, that of Peterhead, in which it predominates, cannot be so durable as that of Aberdeen.‡

TENANT - RIGHT.

We are enabled to lay before our readers several communications on the subject of "tenant-right," the discussion of which, at the London Farmers' Club-House in December last, is beginning to excite great and general interest. The question has already been discussed at some of the local farmers' clubs, and will be brought under the consideration of many others at an early day. We also give a full report of the adjourned discussion at the London Farmers' Club-House on Monday, Feb. 2. We are not inclined to concur with those of the speakers who are of opinion that the Legislature cannot interfere beneficially. It may be that, upon principle, you cannot restrain a man from dealing with his own property in any way he pleases; but he must not be permitted to deal with the property of others as his own. The law restrains and punishes the man who deals with my property as his own, whether with or without my knowledge, if against my will; and he who induces me to lay out my money in the improvement of his land, upon the faith of a continuous occupation, and then deals with it as his own, by turning me out of my farm, is morally guilty, although he may not be legally accountable. The subject being once thoroughly understood in its true bearings upon the interest of the landlord as well as of the tenant, will eventually lead to the establishment of a system of "tenant-right;" but, as in the case of all subjects connected with agriculture, it will take time. As bearing immediately on this subject, we refer our readers to the draft of a Bill by Mr. Dean.

TENANT-RIGHT.

SKETCH OF A BILL CALCULATED TO SET THE HEART-BURNINGS OF A LARGE NUMBER OF TENANT-FARMERS AT REST, WITHOUT INJURY TO THEIR LANDLORDS.

SIR,—Allow me to contribute my mite in the way of mitigating one of the greatest evils I know, affecting the interests of the country; and if any spirited member of Parliament will take up the question zealously, I will give him all the assistance in my power to make the measure perfect. My experience on the question of tenants' rights has, during fifty years, been as great as most in the profession, and I could detail, if necessary, some of the most cruel cases ever heard of.

Tottenham, Jan. 24.

JAMES DEAN.

A BILL to promote good and systematic husbandry on farm-lands let from year to year, or for one or more years, by agreement or parole, in England and Wales, and to make provision for compensation to tenants upon quitting, for acts of husbandry performed by them beneficial to the land, but from which none, or only partial returns have been received by the tenants, in consequence of the sudden and short notice given by the landlords to determine their tenancies, and for making the like provision for other tenancies, determinable by the effluxion of time.

Whereas, great loss and injury frequently happens to tenants of farm-lands, from their being obliged to quit the same at the expiration of six months after notice by their landlords, which loss and injury arises from the necessity they are under of cultivating, manuring, and cropping the land in such wise that the full benefit of the capital employed therein cannot be received by the tenant from the land in less than three or four years from the time of such expenditure.

For the prevention of such loss and injury in future, and with a view to the advancement of good and systematic husbandry, the due employment of the labouring classes, and the increase of farm produce for the benefit of the community at large, may it please your Majesty,

That it may be enacted, and be it enacted by the Queen's most excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal and Commons in this present Parliament assembled, and by the authority of the same, That the Inclosure Commissioners and their assistants for England and Wales, shall be the arbitrators for carrying this act into execution, and shall assist in like manner as if the matters and proceedings directed and authorized by this act were matters and proceedings directed or authorized by the said Inclosure Act.

And be it enacted, That all the powers by the said act given to the assistant commissioners to require the attendance of witnesses, to administer or receive declarations and examine witnesses, and to cause to be produced before them writings or documents, and the power given to the said commissioners to delegate to the assistant commissioners, or to any one or more of them the powers given to such commissioners, except the power to do any act required to be done under the seal of the commissioners, shall be applicable to, and may be exercised for, the purposes of this act, as fully and effectually as if the matters and proceedings were authorized to be done and taken under the said act.

And for the purpose of making provision for settling cases of disputed compensation arising under this act, be it enacted, That if any difference shall arise, or if no agreement can be come to between the tenants and the owners of any lands, or of any interest in any such lands

injuriously affected by any notice to quit the same, as to the amount of compensation to be made in respect thereof; or if by reason of absence of any such owner be prevented from treating, or if by reason of any impediment or disability any such owner be incapable of making any agreement for enabling the tenant to ascertain the amount of compensation to be made to him; or, if any such difference arise as to the amount of compensation so to be made, the amount of compensation to be paid by the owner to the tenant shall be settled by an assistant commissioner in manner hereinafter mentioned.

And be it enacted, That where it shall be necessary to refer any such question to the determination of an assistant-commissioner, by reason of such differences aforesaid, then one month, at the least, before a petition shall be presented to the inclosure commissioners by the tenant, praying for the appointment of an assistant-commissioner, the tenant shall give notice, in writing, to his landlord, or the person in receipt of the rent, of his intention to prefer such petition; and in such notice shall state the particulars and amount of his claim for compensation for the loss and injury which he shall sustain by reason of quitting the farm upon such short notice as aforesaid, or by reason of the effluxion of time as aforesaid.

And be it enacted, That if any tenant who shall be entitled to any compensation in respect of any interest in the farm he is about to quit by reason of notice to that effect from his landlord, shall desire the amount of such compensation to be determined by an assistant-commissioner, it shall be lawful for such tenant to give notice, in writing, to his landlord of such his desire; and he shall, in such notice, state the nature and full particulars of the interest claimed by him in his said farm-lands, and the amount of the compensation claimed by him in respect thereof; and unless his landlord be willing to pay the amount of compensation so claimed, and shall enter into a written agreement for that purpose, then, after twenty-one days from the delivery of any such notice, the tenant shall be at full liberty to prefer his petition to the commissioners, praying them to direct an assistant commissioner to inquire into the matters in difference between the parties accordingly.

And be it enacted, That the assistant-commissioner before whom such inquiry shall be held, shall make and sign his award; and, being so signed, shall deliver the same to the parties in difference, or one of them, upon payment of the costs and the expenses to him of the inquiry. And, that upon every such inquiry before an assistant-commissioner, where the award shall be given for a greater sum than any sum previously tendered by the landlord, or if no such sum shall have been tendered, the costs and expenses of the inquiry shall be borne by the landlord; but if the award be for a less sum than the sum previously tendered by the landlord, one-half of the costs and expenses shall be defrayed by the landowner, and the other half by the tenant. Such costs and expenses shall be recoverable by distress and sale; and on application to any justice he shall give his warrant accordingly. And with respect to the amount of the award,

and any costs and expenses payable by the owner of the farm, or of any interest therein, the same may be deducted from the rent then due or which shall become due at the expiration of the term, and the payment of the remainder of such rent shall be a good payment and satisfaction of the whole thereof. But if the rent then due, or to become due, be not sufficient to satisfy the amount awarded and costs, the same shall be deemed rent in arrear, and recoverable as such.

And, with respect to any such question of disputed compensation by this Act authorized to be referred to the determination of an assistant-commissioner, be it enacted, That either party may apply, by petition, to the inclosure commissioners in respect of any such matter, and the assistant-commissioner appointed by them shall examine into the matter of dispute, and make his award therein as is hereinbefore mentioned.

And be it enacted, That where in this act any sum of money is directed to be levied by distress, such sum of money shall be levied by distress and sale of the goods and chattels of the party liable to pay the same, and the overplus, after satisfying such sum of money and the expenses of such distress and sale, shall be returned, on demand, to the party whose goods shall have been so distrained; and no distress levied by virtue of this act shall be deemed unlawful for want of form.

And be it enacted, That in this Act the following words and expressions shall have the several meanings hereby assigned to them unless there be something in the subject or context repugnant to such construction, that is to say:—

Words importing the singular number shall include the plural number, and words importing the plural number shall include the singular number.

Words importing the masculine gender shall include females.

Words, landowner and landlord, shall extend to all bodies politic, corporate, or collegiate, and also to all bishops, parsons, and other ecclesiastical persons, their heirs and agents, and their legal personal representatives.

Words "six months after notice" shall mean any notice to quit less than three years.

Word, justice, shall mean justice of the peace acting for the county, riding, city, division, liberty, or other place where the matter requiring the cognizance of any justice, shall arise, such justice not being interested in the matters in dispute.

Words, tenants, or a tenant, the occupier of farm lands at will, or from year to year, or for one or more years, and their legal personal representatives, as heir, executor, or administrator.

And be it enacted, That this Act may be amended or repealed by any Act to be passed in the present Session of Parliament.

TENANT-RIGHT.

SIR,—I am glad to see the subject of tenant-right taken in hand by the London Farmer's Club, and also occupying considerable attention in the provincial clubs. Nobody disputes the landlord's right to do as he likes with his own, and obtain what rent he can get; but every man with common understanding disputes the landlord's right to claim the property of the tenant-farmer. But such is the law of landlordism; such the law enacted by them to suit their purpose, that the property of the tenantry is not forgotten, but cared naught about.

It is not a matter of surprise to any man conversant with the laws of tenure, that agriculture should have made so little progress, for the capital of the tenantry is so jeopardised as to quite preclude them from improving. There is in a majority of cases no allowance for any improvements, and the landlords claim the manure—a most important item. Now, I maintain that if the corn belongs to the tenant so does the straw, which is one of the component parts of manure, and the other parts are what the land has produced at the cost of the tenant; and the landlord has no more right to claim that important article than he has so many of a tenant's cattle, carriages, or implements.

What would be said or done if landlords who owned building property, claimed so much of the tenant's machinery or household furniture? I am prepared to prove before either Lords, Commons, or any other committee, that while ever such laws exist, the tenant-farmer will be kept in a state of servility. He must continually submit to what rise of rent the landlord thinks proper to impose; vote as his landlord dictates; keep what game the landlord thinks proper; but, worse than all, the enterprising man is prevented from embarking his capital in improvements, when no investment could so well repay him. And there is no better proof it is their intention to keep the tenantry in a state of servility, than their "twice" refusing the bills brought in by Lord Portman for securing compensation to the tenant farmer.

There are exceptions in every rule. There are the first-class landlords, the dukes and lords, such that a tenant might spend his capital safely under them; but farmers, like other classes of society, pay regard to the customs and laws of the country, and are quite aware that the most trifling unforeseen circumstances under a yearly tenure might deprive them of their capital. And there are the second class landlords, the poor duke and lord, and the man that calls himself a country squire, who will continually take advantage of a tenant's improvements.

Although such are the laws of landlordism, yet I believe that if a man persevered in claiming full compensation for all manures and improvements, and the dispute was laid before a tribunal, they would be a block-headed set of jurymen indeed who could not see the tenant's full claim. In fact I am acquainted with a case in the West Riding of Yorkshire, where the landlord has consented, rather than go to trial. But is it consistent in the present age, because such laws were

made to suit a party purpose, that the farmer and community should suffer the loss? My heart will rejoice to see all the farmers' clubs discussing the matter, and depend upon it the day is nigh when men of business habits, as members of Parliament, will abolish such injurious laws.

A SUFFERER

UNDER THE LAWS OF LANDLORDISM.

ON TENANT RIGHT.

SIR,—Being a constant reader of the *Mark Lane Express*, I was very much gratified with the report of the discussion that took place at the Farmers' Club House, in London, in December last, upon Tenant Right. I hope the subject is not lost sight of. I consider it one of the most desirable measures that could possibly be passed into a law at this critical time; there is so much common sense and common honesty belonging to it, that when thoroughly understood I trust neither landlord nor tenant could stand in the way of it; and not only landlord and tenant, but all classes would be benefited; the land would be improved; the tenants' capital would be invested to advantage; the labourers would all be employed, and not sufficient; and the country would be reaping the benefits of the extra produce.

In travelling over England and Scotland, we see some hundreds and thousands of acres of land in a wretched state, a disgrace both to the owner and occupier, and thousands of acres not cultivated in any way, which might be brought into profitable cultivation. All this we have before our eyes, at the same time we are sending our money into foreign nations for corn, and our labourers are starving for the want of employment. It is evident there must be something wanting. I trust the tenant farmers will agree with me, and landowners too, that it is confidence between man and man that is wanting.

There cannot be a higher speculation for a man than to expend money on another person's property without security; there is plenty of capital ready to be invested in making improvements in land by enterprising tenants, providing they dare do it.

It has been too much the practice where improvements have been made (the landlord not a business man, and the agent perhaps brought up in a garret in London), for a tenant to be made to pay interest on his own capital so expended instead of receiving it. It is only justice for tenant farmers to have the same law as their landlords, if they make improvements, to be paid for them on quitting their farms, in the same way as the law now calls upon them to pay for dilapidations. In the north of Lincolnshire, where liberal tenant's rights have been allowed, and in West Norfolk, where the farms have been let on long leases, agriculture is in an advanced state, not only growing more corn than in the Midland counties, but also producing more meat, where a few years back two rabbits paid the rent of an acre of land on a great deal of the two former districts. It is an old saying, but a true one, "necessity is the mother of invention." If the tenants had not been induced to

expend money on their farms in those districts, they would not have lived. Any one that has read Mr. Pusey's report on the farming of Lincolnshire, and the late Lord Spencer's report on West Norfolk, must come to the conclusion that the landowners there have been the means of the improvements being made, by giving every encouragement to an enterprising tenantry. The late Lord Leicester went through the process of being made a practical farmer, and at the same time invited practical farmers to his mansion, from all parts of the country, every year to meet his own tenants, so that they and himself got the benefit of their experience. There is the same course open now to landowners: if they wish to have their property improved, they must give every encouragement to good tenants; throw no obstacles in their way, and I have no doubt the produce of the country would soon be increased one-third, by the ordinary means of farming alone.

I am Sir, yours, &c.,

JAMES WEBSTER.

Peakirk, Peterborough, Jan. 20, 1846.

ON TENANT-RIGHT.

TO WILLIAM SHAW, ESQ., STRAND, LONDON.

SIR,—I received your communication on "Tenant-Right," and perused the same with great pleasure, it having been a subject which I have repeatedly brought before the district agricultural meetings; and shall again bring it before the Windygates Club in March next.

The English farmers, who have generally no leases, and the Scotch who have, ought most undoubtedly to compare notes and deduce some alterations for the public benefit of all concerned, which I am glad to see will be accomplished by the rational method of eliciting discussion on the subject at the different societies through the country. Your remark, p. 6, about farm buildings, comes home to the Scotch tenant with full effect, as I could point to several landlords who have taken possession of cottages built for agricultural labourers, milk-houses, dykes, and other permanent erections, executed solely at the tenant's cost; but because the lease bore no evidence that payment should be refunded, none was allowed.

In like manner, we have many cases where the landlord tests the offer of a way-going tenant who has expended large sums of money upon drainage, and continues his operations to a late period of his lease, from a just pride that he will keep pace with the improvements going on around him, when at last he is undeceived by the possession being let at 1s. or 1s. 6d. per acre more rent to another, who walks in and reaps the advantage of the unexpended capital that the former occupant left in the soil. Consequently, if the practice was general to allow for reversionary improvements on the soil to the way-going tenant, the objection would be obviated, instead of making a stepping-stone of the former tenant's capital to advance the income of the landlord. In short, the boasted Scotch farming, is plodding on with the antiquated valuation at the end of leases, of a tenant

being only paid for what dung remains after the turnip crop is sown, and the labour and rent of his fallows; but almost in no case is valuation allowed for tillages or unexpended manures, a system long practised in England.

The injurious effect of game is also alluded to by Mr. Bodington. I am sorry to say that in the county of Fife this subject has been the cause of more dissension betwixt landlord and tenant than any other that I am aware of; but the aggression is on the part of the landlord, and a direct infringement on the capital of the farmer, which may be shortly stated as follows:—Proprietors have fostered game to that extent that poaching has become a profitable trade to the idle and dissolute; and in self-defence small proprietors have encouraged men of this description to take a licence, to protect their turnips from the ravages of the game reared by the great proprietors who rear pheasants, hares, and rabbits, and turn them into the standing corn of their tenantry, for the effeminate pastime of battues, when cart loads of game are killed and transported direct to the market for sale and profit—a practice so detrimental to the interest of the agriculturist in corn-growing counties cannot longer be submitted to; while if more confidence were reposed in the tenantry, plenty of game would always be found for rational recreation to the landlord and his friends.

I beg leave also to acknowledge receipt of "Thaër's Principles of Agriculture."—I am, sir, your most obedient servant,

ROBERT BALLINGAL.

Kingsdale, Jan. 12, 1846.

ON TENANT-RIGHT.

TO WILLIAM SHAW, ESQ., STRAND, LONDON.

DEAR SIR,—I received yours of the 2nd inst. inclosing a copy of the debate on "Tenant Right," at the London Farmer's Club; and the subject would have been discussed by the members of the farmer's club at our last meeting, but our anniversary dinner has been put off until the 10th Feb.

The subject is one that claims the particular attention of all tenant-at-will farmers; and as leases and compensation to off-going tenants for permanent improvements are unknown in this part of the country, I trust that recent events in Parliament will rouse the farmers from the apathetic and slow-coach paces, and that they will all unite to force the Legislature to pass a law that will give to the skilful and industrious tenant a *bona fide* right for outlay of capital, and real improvements, whether of land or buildings. To speak from my own knowledge, you may rely upon it that from the date of such a bill becoming the law of the land (and all other rules, &c., would be nearly useless) we should soon find what a magic change would spread over the country; improvements, great and permanent, beyond present calculation would take place upon the heavy clay soils, and in a short time an abundance of grain, nearly sufficient to supersede foreign imports, would be grown by a class of men that are now reproached for being behind the times—*alas! thousands dare not attempt to keep in advance.*

I will forward you our opinions on this question as early as possible.

I remain, Dear Sir, your most obedient servant,

Jan. 30, 1846.

F. BROWNE.

MONTHLY MEETING OF THE FARMERS' CLUB.

TENANT-RIGHT.—ADJOURNED DISCUSSION.

The usual monthly meeting of the members of the Farmers' Club was held on Monday, February 2, in the rooms of the club, at the York Hotel, Bridge-street, Blackfriars.

The subject of discussion was the all-important one of "Tenant-Right," which had been adjourned from the special meeting of the club held on the 10th Dec. last, on which occasion the question was ably opened by Mr. W. Shaw, of the Strand, London. A resolution, acknowledging the necessity of a tenant-right, was carried on that occasion; but as there were many gentlemen then present who had not an opportunity of expressing their sentiments on the subject, it was, at their desire, adjourned for further discussion.

Mr. BAKER, of Writtle, took the chair; and having reminded the meeting that the discussion stood over for the purpose of being further and more fully discussed, said it now rested with some gentlemen present to resume it. He was quite satisfied, from the great knowledge and talent which had been displayed on the previous occasion, and the earnest desire which had been expressed on the part of many members to offer their opinions upon the subject, that they would not be at a loss to-night for a continuance of it (*hear*). He should not now take up their time by any extended observations, but rather wait to hear other gentlemen, and content himself with making a few remarks in reply towards the end of the discussion. Mr. Shaw, as most of them were aware, had opened the question; that gentleman, he was sorry to say, was not present this evening, but it would be competent for any one present to offer his opinions upon the subject.

Mr. THOS. FORDHAM said he was extremely sorry that Mr. Shaw was not among them. He begged, however, to mention an anecdote, which he thought would strengthen their position, and show the necessity of that for which they were seeking. There was a piece of land at Padworth, in Berkshire, belonging to the vicar, which was so bad that no one would have anything to do with it for some time. At length a Mr. Baldwin undertook to rent it at 35s. per acre, if a lease of 7 years were granted. This was done, and, although there were only two or three inches of soil upon a considerable depth of gravel, Mr. Baldwin soon greatly improved the land. Some time afterwards, when five years of the lease had run out, the Great Western Railway Company wanted the land; and instead of going to the tenant, went to the landlord, and offered 100l. an acre for it, about double or treble the value of the fee simple. Subsequently the landlord, through his agent, waited upon the tenant, requesting him to give up the land, and asking him what he wanted for it. His reply was that he had expended a good deal of money upon it, and ought to be remunerated. The agent said he was of opinion that one or

two hundred pounds would be sufficient compensation. Mr. Baldwin said he thought not, and the matter was submitted to the decision of an umpire (Mr. Pitt), who awarded him 450l. for the two years remainder of his lease. This, he thought, showed how cautious people ought to be to avoid taking land without a lease; in the instance he had mentioned, Mr. Baldwin, in spite of all his exertions to improve the land, might have been turned out, losing all that he had expended upon it but for his lease, which secured him something like an equivalent upon his quitting (*hear*).

Mr. BEADELL said he thought they could hardly identify such a case of rapacity as that mentioned by the gentleman who had just addressed them with the general question of tenant-rights (*hear*).

Mr. EDWARD AITCHESON said, that having been the last who spoke at the December meeting on this subject, he felt, by way of again opening the question, disposed to renew some of the arguments which he had then used. He had on that occasion heard a great many observations very much to the purpose. Gentlemen had offered their opinions just as they were impressed at the moment; he somewhat objected to a long adjournment of the discussion upon one question, because it looked as if they had not made up their minds upon it; he begged to remind them, however, that his opinion was that this matter of tenant rights was one upon which the legislature could never be called upon to do them any good. There was, however, one other course open to them, and which he thought it very desirable to adopt. It was this:—That there should emanate from the Farmers' Club a certain committee of gentlemen to draw up a form or code of tenant-rights, which might be printed, and published at a cheap rate, or at the expense of the Farmers' Club. He thought six of the most experienced land valuers of this country would be able to produce something which should be looked to as the book and letter from which farmers should draw their leases. If this were done they would then at once have something like a clear code of tenant-rights. He would propose that the club should pass a resolution to this effect. He thought this was the only course by which they could bring the matter to any head whatever, and without it all their discussions would fall to the ground without result (*Hear, hear*).

Mr. BEADELL said, in ordinary cases if a man erected a temporary building for his own use upon premises which he occupied, he had a right to remove it upon quitting them, if he thought proper. But the judges had ruled that the farmer was an exception from this case; therefore if a farmer erected buildings which were quite as necessary for the operations of his farming as for the purposes of any manufacturer or trader, and he happened to have a bad landlord, not only was he compelled to leave these buildings, but he was [compelled] also to

leave them in repair, no matter how long he might have occupied his farm (*Hear, hear*). They all knew that the great thing they wanted, to encourage them in experiments to make the land produce as much as it was capable of producing, was security of tenure (*cheers*), and a long lease was necessary for that. It was useless to ask the legislature to compel every body to grant leases; many gentlemen had their property so much encumbered (it was useless to attempt to conceal the fact), that they could not do it (*Hear*). If a person had his property mortgaged he could not grant leases which would be good against the mortgagee (*Hear, hear*). But he suggested that they might meet the difficulty in this way:—They might freely go to Parliament, and say, “Compel either the landlord or the succeeding tenant to pay us for the improvements which we have made upon the farm.” He (Mr. Beadell) did not ask compensation for manure, for sheep-folding, or for the application of guano to the land, of which the tenant himself received the major part of the benefit himself. But he did ask some security of compensation for draining land which would be useless without draining, and which if effected would cost from £4 to £5 per acre; he had a right to look to security for receiving back some portion of that which he expended for the permanent and everlasting benefit of the landlord's property (*Hear, hear, and cheers*). They had a right to expect and ought to have it; they could not get it by means of lease; let them have it, then in the way in which he proposed (*Hear, hear*). Some tenants had been told after they had occupied farms for a certain period that they must have one third more added to their rental, or they must leave, whilst in point of fact they (the tenants) had made the farms worth the improved rent which was demanded of them (*Hear*). By draining and chalking they had converted very inferior land into very superior land, and then they were called upon for an increase of rent. Surely this was a great injury inflicted on the tenant (*Hear, hear*). If covenants were to be drawn up according to such a code as had been suggested, we should not find such diversity in them, or such exploded notions as were now frequently found in almost every lease. He made these observations because it had frequently struck him, and did so still, that if they were only true to themselves they might remove the difficulties under which they laboured, and that something like legislative interference might be of use to them (*Hear*).

Mr. EDWARD AITCHESON wished to ask Mr. Beadell whether he thought it possible that the Legislature could compel any man to grant a lease upon a principle other than that on which he himself chose to grant it? He (Mr. Aitcheson) did not think it was possible to compel any landlord to let his land subject to the conditions which Mr. Beadell contemplated if he did not like to do so. How could they arrange, in the case of a mortgaged estate, with five or six different individuals? (*Hear*).

Mr. BEADELL said he would not attempt to limit or define what Parliament could or could not do; but it had already done a good deal that he did not like, and among other things it had blessed them with an income tax (*Hear, and a laugh*). He did not, however, desire any specific legislation on this subject; all he wanted was a declaratory act to the effect that it should be the prac-

tice for either the landlord or the succeeding tenant to pay the out-going for permanent improvements, or for stock left in the land. Admitting even with the gentleman (Mr. Aitcheson) who had put the question to him, that it was impossible to legislate upon the subject; he contended that great good would be done by the mere mooted of the question; if they could not convince 1,000 of the injustice of which they complained, they might induce 900 to fall into their views from very shame (*Hear, hear, and cheers*).

Mr. KING said, with respect to building erected by the tenant upon a farm, it had been said that they became the property of the landlord, and that the practice in this respect was different in the case of farmers from that which prevailed among manufacturers and others. This was unquestionably the case (*Hear, hear*). Now he begged to suggest that an act of Parliament might be passed to put them both on the same footing (*Hear*). It appeared to him that the observations of the gentleman who last sat down (Mr. Beadell) applied to cases where there was no lease; and, therefore, he agreed with him that a declaratory law would be of great benefit (*Hear, hear*).

Mr. SHAW (of Northampton) said that since he was present here at the last meeting, he had endeavoured to promulgate, to the utmost extent of his power, the opinions which he had then heard expressed, one of the best of which perhaps, was this—that you must first convince the landlord that he will himself derive benefit from doing justice to the tenant before you can bring him to accede to your views (*Hear, hear*). They must first endeavour to knock this into the landlord's head (*Hear, and a laugh*) or they would do very little good. Mr. Shaw here read the passage from Sir Robert Peel's speech in which he proposed to advance money by means of Exchequer Bills for the encouragement of agriculture; and then proceeded to say that if the landlords granted tenant-rights, and thereby induced their tenants to lay out their capital in the improvement of their farms, the matter would be much better accomplished than by Sir Robert Peel's plan of borrowing money (*Hear, hear*).

Mr. WOON (of Sussex) said he should not feel justified in obtruding himself a second time on this question (having spoken at the former meeting), but that he was desirous of making a remark or two on observations which had fallen from gentlemen to-night. Mr. Aitcheson and Mr. Beadell at first appeared to differ in opinion, but he thought they agreed in the material points of the question. He (Mr. Woon) thought that it would be very desirable if they could fix and define what should be the custom of the country generally on this subject; but he did not see the use of interfering by legislative enactment with private bargains, although it would be very judicious and advisable to have a declaratory act, if they could get it, which should fix what was the custom of the country in cases where there was no lease or stipulation. That was necessary for the beneficial cultivation of the soil (*hear, hear*). He was of opinion that, if this custom were declared by act of Parliament, nine cases out of ten would be governed and regulated by it, and that, therefore, the greater part of

the country would come under such an act; and if the custom were set aside in particular cases, it would be because the nature of the soil did not admit of its being carried into effect (*hear*). He admitted the full force of Mr. Beadell's observations with regard to erecting farm buildings, and he thought it highly desirable that the tenants should erect them for themselves. Many persons had peculiar notions of their own, and although the agents might be desirous of benefiting the farmer, they might be mistaken in their views, or from the nature of their occupation, and the force of habit, much more apt to benefit the landlord (*hear*). He repeated that he, for one, was in favour of obtaining some general act of Parliament, which would apply to all cases not set aside by some special act (*hear*).

Mr. CUTHBERT JOHNSON thought Mr. Wood had confined his attention exclusively to the advantage of tenants-at-will; any declaratory act of Parliament that gentleman confessed would be confined to the advantage of those who took their farms without any lease at all—in short, who were mere tenants-at-will (*hear*). He (Mr. Cuthbert Johnson) was not much in favour of that sort of occupancy; he was much more in favour of a good, a long, and a liberal lease (*hear*). It was all very well to procure, if they could, an allowance for buildings, manure, and permanent drainage; but if there were such a declaratory act passed, of this description only, in favour of the yearly tenant, it would operate against granting leases altogether. The tenant would then say "It is of no use to have a lease." What then would be the result? The landlords of England would add—"In the absence of any agreement you will go out with a certain advantage; I shall insist therefore upon having some regular agreement consonant with my idea of justice, the custom of the country, and the custom which I and my forefathers have adopted and perpetuated." He (Mr. Johnson) made these remarks in the hope that the clubs throughout the country should not undertake a crusade which could not prove of any benefit (*hear*). The great use, as he had before stated, and which he again repeated, and which he took to be the legitimate and certain fruit of these discussions, was the diffusion of the knowledge among the landlords of the country that the more liberal the covenants of their leases, and the more carefully they provide that good tenants should be amply rewarded for the capital and skill applied to their farms, the more would their own interests be promoted; and when that true and legitimate persuasion shall be once thoroughly diffused, from that time forward they might rest assured that tenant farmers would never have to complain of illiberal treatment on the part of their landlords (*hear, and cheers*).

Mr. TURNER perfectly agreed with what had fallen from Mr. Beadell and Mr. Aitcheson, although he did not think they went far enough. He did not see why the tenant should not be protected by legislative enactment. When a farm ran out at the end of a lease, and there happened to be any disagreement between the landlord and tenant, let them only consider what a loss there was to the public for several years after the expiration of that lease. He had himself suffered considerably from taking to farms run out in this way; he had

seen land on such farms produce a greater number of bushels of weeds than of wheat per acre (*hear*). A farm run out in that way would produce nothing for the first two or three years, and consequently paid nothing to the public revenue. A lease generally provided for certain covenants, to be acted upon in case of its being given up; but when a farm was let without any lease, why should there not be a provision by act of Parliament to compel the landlord to make an allowance for all money expended upon the farm by the tenant? He could see no objection to such a course; there were many acts of Parliament passed for which there was much less necessity (*hear*). One grand argument in its favour was the loss of provisions and necessities of life caused by a farm being run out as he had instanced. To secure compensation to the outgoing tenant, he thought, was the principal tenant-right which came within the scope of their exertions; not that he disagreed with or dissented from the plan which had been suggested, of appointing six gentlemen, of judgment and practical experience, to draw up a code. This would be of more advantage to agriculture than all the loans of Exchequer Bills which could be made for that purpose (*hear*).

Mr. SPOTTISWOODE said it often happened that when discussions were entered into, many things were said by one gentleman and by another, thinking that they were opposing each other; but when we came to look closely into their different views, we found that they were very much agreed (*Hear*). Now he did not agree with the gentleman (Mr. Aitcheson) who said that the Legislature could do nothing for them; for he thought, with Mr. Beadell, that it could do much (*Hear, hear*). It had been said very truly by Mr. Wood that nothing which the Legislature could do ought to affect or control the bargain which one man makes with another. In this he quite agreed; but at the same time he did not see why the Legislature should not be called upon to secure to the tenant, from the landlord, that which was only just and right (*Hear, hear*). He agreed with the suggestion which had been thrown out for appointing a committee of gentlemen, or some other such body, to ascertain what the tenant-farmer really did want. At present, he thought they scarcely knew what they wanted; and it would be idle to ask of Parliament that which they did not themselves fully comprehend (*Hear*). The injustice of which they often had to complain did not arise in many cases so much from the want of good feeling as from the want of perception of the grievance. That the intention of "screwing" the tenant was general, he could not for a moment believe. With regard to a tenant-at-will, the law prescribes what are his rights; it may not define them properly or wisely or justly, and it was of that they had to complain. He did not think the body of landlords (who were strong in Parliament, as they ought to be, although, he was sorry to say, he feared the time was approaching when they would not be so)—he did not, he said, think that the body of landlords would dare to oppose so just an application as that which was contemplated by Mr. Beadell; and therefore he thought it was diffidence on the part of Mr. Aitcheson to say that

Parliament could do nothing for them (*Hear, hear*). It was only reasonable to first ascertain what it could do, and then to endeavour to get it done (*Hear, hear*). There was one part of the discussion this evening with which he had been much disappointed; he alluded to the remarks of Mr. Shaw (of Northampton). That gentleman had appeared to be opening up a very important part of the question in a very proper manner, but he did not pursue it. He had read a part of the speech of Sir Robert Peel, in which that right hon. gentleman appeared to go altogether beyond reason, beyond justice, beyond common sense, beyond every tie that ought to bind us, and every principle which ought to rule and govern and guide us. Mr. Shaw had alluded to the plan of lending money in Exchequer bills for the improvement of agriculture, but he had not pointed out the evils of the system. He (Mr. Spottiswoode) was of opinion that the Exchequer bill system, as at present framed, was a mere instrument of monopoly in the hands of the rich, to the detriment and injury of the industrious classes; and that excessive production was a production in favour of the rich, and to the prejudice of the poor. If the present system were pursued, pauperism must increase, and the tenant-farmer must necessarily be swamped and reduced to pauperism himself. To that point they ought to turn their attention. Let them look to the results of neglect already. Some little time ago an Agricultural Protection Society had been formed by parties who felt that there was a power which was dragging them down. The society was itself founded on a false basis, or it might have done much in resisting the innovations of the rights of agriculture; had it been otherwise, probably they would never have seen what they had witnessed within a week from that time. The society was ultimately swamped by allowing the landlords to take the lead in it. Doubtless the interests of the landlord and the interests of the tenant ought to be the same; but a bad system had separated them. It was that system which made these discussions necessary. Our present laws had a tendency to enrich the rich and to impoverish the poor. The tenant-farmers were, however, strong enough and possessed of intelligence enough, if they acted up to their principles, to obtain what they sought, and then not only to do justice to themselves, but to the body of labourers who were dependent upon them. After some further remarks, which were addressed to the meeting in a tone of considerable warmth, he said that he regarded the present tendency of legislation as calculated to bring about the disorganization of society; that, so long as the few gained all the advantage, to the prejudice of the many, there must be misconduct in those who were elected. The time, however, must come and would come when the many would say, "We will have food" (*Hear*). He frequently heard people talking about the price of corn, upon which he asked them the price of money. To that question their reply was, that they did not understand him. Now, if they did not understand the one, how was it possible that they should understand the other (*Hear, hear*).

Mr. SHAW (of Northampton), after a few words of

explanation said, that with regard to working out the intention of the club respecting the appointment of a committee of six gentlemen who were land valuers, he begged to suggest that the club should go far beyond the proposition of Mr. Aitcheson or Mr. Beadell, and that they should select one gentleman out of every county in England, who, no doubt, would give them a meeting, and report to them on the subject.

Mr. BEADELL said it appeared that Mr. Aitcheson and himself had made a few remarks, some of which the gentlemen present liked, and some of which they did not like (*Hear*). But he had not heard a single observation which went against the original proposition of his friend Mr. Aitcheson, for the appointment of a committee of six gentlemen to draw up a code; and he thought the club would act wisely at once to act upon that suggestion (*Hear, hear*). With regard to the observations of Mr. Spottiswoode, he must say that he could not allow the wholesale condemnation of Sir Robert Peel to pass without declaring that he did not think that right honourable gentleman guilty of the conduct imputed to him (*Hear, hear*). If Mr. Shaw had taken the commencement of Sir Robert Peel's speech, and read that instead of taking an isolated portion, he would have found that he there stated that his opinion had been altered from certain facts which had occurred. Now, suppose he had entertained these altered opinions and yet been content to go on as before, why he would have deserved to be considered as one of the greatest hypocrites that ever appeared in the human form (*Hear, and "So he is now," followed by a laugh*). He (Mr. Beadell) did not think so. This gentleman was about to proceed with his observations on the conduct of Sir Robert Peel, when he was called to order by

The CHAIRMAN, who reminded him that he was becoming political, and that, according to the rules of their club, politics were not to be introduced.

Mr. BEADELL said he cheerfully bowed to the decision of the chair, although he did not think his observations had been more political than those of the gentleman (Mr. Spottiswoode) to whom he was replying.

Mr. FISHER HOBBS said he felt that he was placed in the same position as many of the speakers who had preceded him, namely, that he had come with the expectation and intention that he should listen and hear, and not speak or give his opinion. He must say that he regretted that Mr. Shaw, who had brought forward the motion at the previous meeting, was not now present. He (Mr. Hobbs) would have come prepared with facts upon which to ground his arguments, if he had not thought that gentleman would be there to do so. He begged, however, to say that he did not agree with Mr. Aitcheson that tenant right was a subject upon which Parliament could not legislate. He thought it would be very easy to form a code which should meet all the difficulties of the case. It was no doubt a very great hardship when a farmer had to quit a farm having a considerable amount of unexhausted capital in the soil; it often happened from various circumstances that he was so compelled to quit, and left thousands of pounds in the land which justly belonged to himself (*Hear, hear*). It had been remarked this evening that Sir Robert Peel recommended

an improved cultivation of the soil; he agreed with the right hon gentleman that there was room for a vast improvement in this respect, but thought that his proposed measures would do more to introduce foreign agriculture than tend to the improvement of our own (*Hear, hear*). He did not quite coincide with Mr. Aitcheson that six land-valuers would be exactly the committee to draw up a code of laws for the regulation of tenant-rights (*Hear*). He did not mean to allude to those gentlemen with any want of respect, but he thought the better plan was to have a mixture of tenant farmers with the land-valuers (*hear, hear*). The land-valuers might endeavour to do their utmost for the interests of the tenant, but as they were generally employed for the landlord, their natural tendency would be rather to take care of the landlord's interests than those of the tenant (*Hear, and a laugh*). He thought an infusion of tenant blood into the committee, as originally suggested, would form such a body as might safely go to the houses of Parliament, and ask the support of the Duke of Richmond and Mr. Pusey, who had both promised to lend them their valuable aid (*Hear, hear*).

Mr. EDWARD AITCHESON said, when he proposed that there should be appointed a committee of six land-valuers, he certainly did think that six conscientious men might be found who would look to the interests of the tenant farmer (*Hear, hear, and a laugh*). He had not, however, the least objection to see the names of one or two gentlemen from each county, or one from every parish in England, added to the committee he had proposed, if it were thought necessary (*Hear, hear*). But at the same time he knew that where too many met together, very little business was done (*Hear*). If the committee which he proposed produced a pamphlet, their production would no doubt meet with many opponents; that opposition would lead to discussion; and in the end they would thereby get what they wanted (*Hear*). With regard to leases there was no difficulty; if a man took a farm on a lease terminable at 7, 14, or 21 years, all he had to do was to have a covenant inserted that at the end of each break should enable him to say to his landlord "Are we to go on? or will you pay me for my improvements?" If he had this covenant, he would then be in a proper position. But yearly tenants were in a very different position; and therefore he (Mr. Aitcheson) wanted a code clearly defined, and fixing the valuation which should be put upon the improvements effected and left behind in the land (*Hear, hear*). He repeated that all he wanted was that the tenant farmer should be compensated by a certain and fixed rule of valuation laid down on the best principle which could be adopted by six practical men, who were land-valuers, adding, if they liked, six and thirty practical farmers. They neither wanted to oppress the landlord, nor to get more than they were entitled to (*Hear, hear*). The most obvious improvement for which they were entitled to remuneration was that of drainage; and it would be for this committee in their code to say to what amount of compensation a tenant was entitled for such improvement at the end of 3, 5, 7, or 14 years. They wanted, in fact, to know upon what tenure, and upon what principle they entered upon their land (*Hear,*

hear). These were the principles by which he was actuated in making the proposition for a committee (*cheers*).

Mr. TURNER said, for his part, he would rather take six land-valuers and six tenant farmers for the formation of the proposed committee, than any other number; and he thought it would then be quite numerous enough to manage the matter. All he (Mr. Turner) wanted, was, that the tenant should be paid for improvements effected, and for unexhausted manure left in the land; if this arrangement were once carried into effect, all ill-feeling between landlord and tenant would soon be done away with (*Hear, hear*). He begged to move that a committee thus constituted be appointed, viz., six land-valuers and six tenant farmers.

Mr. KNIGHT (Edmonton) said, he was not present at the last meeting upon this subject, although he had read with very great pleasure a report, in the *Mark Lane Express*, of the remarks which had been made on that occasion (*hear*). He quite agreed with what had fallen from Mr. Beadell this evening, with respect to the necessity of obtaining some legislative enactment on the question of tenant rights. In the course of the discussion, however, he begged to remind the meeting, that no one had thought of mentioning the case of the property of public companies, or of church property. Now, unless a legislative enactment were obtained, neither public companies, nor parties in trust for property belonging to the church, could be made to meet the demand contemplated as a tenant-right (*Hear, hear*). A church lease ran for seven years; at the end of the seven years, the surveyor came again, ran over the land, and said—"This is worth more money than you pay, and I must have more money for it;" and if, on the other hand, the tenant worked out the farm, why then the public were the losers, as Mr. Turner had well pointed out (*Hear, hear*). It was well known how public companies acted in this respect; if the land were well farmed, they came down and demanded an increased rent, and if badly farmed, why, as in the other case, there was the alternative of public loss (*Hear, hear*). Under these circumstances, he should strongly insist upon the necessity of interference in their behalf by legislative enactment. In the case of heads of colleges, he was quite sure they would be glad to be placed in such a position as an act of parliament of the kind contemplated would put them (*Hear, hear*).

The CHAIRMAN reminded the meeting, that although they had this evening heard the opinions of a considerable number of gentlemen, they had not, as yet, had any resolution embodying those opinions, formally proposed and seconded. He begged to say for himself, that he had long been and was still of opinion, that it rested with the legislature to frame some enactment upon the important subject of their discussion; he thought rested with the legislature, and with the legislature entirely, to do this (*Hear*). It was, beyond a doubt, a question which ought to be provided for by law; indeed it was to a certain extent provided for by law, but not to a sufficient extent to give the tenant that right over his own interests to which he was entitled (*Hear*). Every one knew that if he went and hired land as

a yearly tenant, that it was in the power of his landlord, by giving him six months' notice, to oust him from his occupation, and seize upon all his improvements. Was not that the law? (*hear, hear*). Well if it was, why may it not be as easily made the law to compel the landlord to give a longer notice than six months'? (*Hear, hear*). The notice under the present state of the law was given on the 25th of March, and at that time the tenant had made all his arrangements for the year. He may have been purchasing manure, put in his spring-seed and his corn-seed—yes, positively put in his seed—when at the very last moment comes a notice from his landlord to quit the farm, and leave all his improvements behind him (*Hear*). Was this equity if it was law? (*Loud cries of "Hear"*) It was such points as these that ought to be corrected, and thereby put the tenant on the same fair, equitable, and safe footing as other men (*Hear*). If a tenant put up a farm building, he was not only bound to maintain it in repair during his occupancy of the farm, but he was bound also to leave it in repair on quitting the land; any other tenant had the power of taking it down (*Hear*). But because a special jury had decided that this should not be done, their decision had become a precedent against the tenant farmer: the trading community were wiser in their generation. The fault, however, was rather in the law than in the practice. If the principle of a tenant-right were adopted, it would put an end to that great competition for farms which was frequently allowed to act injuriously to the occupying tenant, and prevent that practice of one person riding over the head of another. If a person took land at 20s. an acre, and by his capital and skill made it worth 30s., he ought to receive compensation if compelled to give it up. The system which at present prevailed operated in such a way as to induce the tenant to resort to all kinds of stratagem and cunning. He went on improving his farm for a certain period, but at the end of that time he began to say to himself, "Now, in order to protect myself, I must take the capital which I have expended out of the land." During the last seven years of his lease he set about the accomplishment of this object, and the consequence was that he frequently left the farm in a worse state than he found it upon first entering it (*Hear, hear*). This, of itself, was a sufficient reason why agriculture did not improve in this country as it did in others. Let them by all means alter the law. There was no difficulty in defining the tenant right; it was a matter of every day practice. He (*Mr. Baker*) was in the constant habit of making farm valuations, and knew that as there was no difficulty in defining the extent and value of the improvements for the landlord when a new tenant was coming in, neither could there be any difficulty in the other case. He was recently called upon to value the improvements in a farm which had been let for twenty-one years, and in two years after it had been taken at 14s. an acre, the land was found to be worth 21s.; so that in the short space of two years the tenant had increased the value of the property to the amount of one-third, or 33 per cent. (*Hear, hear*). With regard to the suggestion that this question should be referred to gentlemen from various parts of the country, he begged to say that he did not

see why they should go out of their own club in order to get opinions upon the subject (*Hear, hear*); he thought the matter should emanate from them. He did not see why they should go beating about for information; indeed, he thought it would be rather *infra dig.* in the club to do so (*Hear, hear*). Let them appoint six, or ten, or twelve, or whatever number of gentlemen they thought proper for that purpose; but let them be selected from among the members of this club. To them the question could be submitted; and, when they had drawn up their code, let there be another meeting to approve of what they had done (*Hear, hear*). The matter was one of the greatest importance to the farmers' interest, and more important at the present period than it ever had been before (*Hear*).

Mr. TURNER then rose, and submitted to the meeting a formal resolution to the effect "That six land valuers and six tenant farmers, being members of this club, be appointed to investigate the subject of tenant-rights, and that they be requested to draw up a series of rules thereon to be submitted to the club for adoption" (*hear, hear*).

Mr. SHAW (of Northampton) moved, as an amendment, that the land-valuers should not be members of this club.

Mr. EDWARD AITCHESON suggested to the gentleman who had just moved the amendment whether, as the subject was to emanate from this club, it would be right to introduce foreign bodies? (*hear, hear*.) As this matter had arisen out of discussions at the Farmers' Club, he did not think it desirable that the committee should be comprised of any but members of the Farmers' Club.

Mr. TURNER said when the code should be drawn up, as proposed, they would have opinions enough upon it from all parts of the country (*hear, hear*).

Mr. SHAW explained that the object of his amendment was to admit gentlemen of undoubted practical knowledge, even if they happened not to be members of the club. There was Mr. Beaseley, for instance, of Northampton, who would be invaluable as a member of the committee; but he was not a member of the club (*hear, hear*).

Mr. FISHER HOBBS said he quite agreed with the gentleman who had last spoken that it would be very desirable to have the assistance of such a gentleman as Mr. Beaseley; but, at the same time, he did not think that they ought to go out of the club in selecting the members of the committee.

Mr. Shaw said that, perceiving the feeling of the club, he would at once withdraw his amendment (*hear, hear*).

Mr. SPOTTISWOODE was quite of opinion that the committee ought to be confined to members of the club. There was one point of great importance to which he wished to call the attention of gentlemen present, and that was what the committee would have to consider (*Hear*). The whole of this discussion had been confined to the interests of the outgoing tenant; but there was another right which he considered well worthy the consideration of the committee, and which he wished would be brought under their notice, namely, the nature of rent. At present the tenant paid a "gold" rent, if

he might so speak; and the question was, whether it would not be much better that he should pay a "corn" rent (*Hear, hear*). He begged to suggest that a pound was nothing but a piece of gold, and moreover to remind them that when the tithes were commuted they were commuted for a "corn" pound, and not for a "gold" pound (*Hear*). Now, he wanted to know why should not rents be arranged in the same way (*Hear*)? The present system had led to a separation of interests between the landlord and tenant, which it was impossible to conceal. He thought the corn pound ought to be adopted, and not the gold pound. The gold pound was nothing but the tool of the money dealer. If they wanted to have a *bonâ fide* rent, let them have a corn rent. They did not eat gold or live upon gold, but they did eat and subsist upon corn, which was the natural sustenance of man, and the foundation of all value. He believed that the adoption of a corn rent would do them more good than anything else that could be devised (*Hear*).

The CHAIRMAN then put Mr. Turner's resolution to the meeting, which was carried unanimously; and after

a short discussion, in which Mr. Brown, Mr. Knight, Mr. Hobbs, Mr. Pocock, and Mr. Muggerridge took part,

A committee was nominated, consisting of the following members (with power to add to their number), the six first-named being land-valuers, and the others being tenant-farmers:—

Mr. Baker, of Writtle; Mr. Trinder, of Cirencester; Mr. Anderson, of Oakley, Beds.; Mr. Bell, of Bucklersbury; Mr. Brown, of Wilts; and Mr. Dixon, of Oxford; Mr. Fisher Hobbs, of Mark's Hall, Coggeshall; Mr. Thomas Knight, of Edmonton; Mr. Edward Aitcheson, of Tonbridge Wells; Mr. Hudson, of Castleacre; Mr. Turner, of Devonshire; and Mr. Samuel Jonas, of Cambridgeshire.

Another discussion took place on the question, whether the subject should or should not be resumed on a future day; and it was at length decided that the discussion should be adjourned until after the committee should have made their report.

Thanks were then voted to Mr. Baker for his conduct in the chair, and the meeting separated.

BROMSGROVE FARMERS' CLUB.

At the last meeting of the Bromsgrove Farmers' Club, Mr. Wright, of Bentley, read the following paper on "tenants' rights."

Of all the arts and sciences that can engage the attention or industry of mankind, agriculture, or the cultivation of the earth, must stand pre-eminent, for on its being properly understood depend the comfort, happiness, and welfare of the millions that inhabit the earth. If the cultivation of the soil was worthy the attention of kings in olden times, surely it cannot be less so now, when our great and rapidly-increasing population demands all the energy, skill, and industry of the agriculturist to grow two blades of grass or corn where one grew before. To render the tenant farmer beneficial to mankind, he must be cherished and fostered by the generous hand of the landed proprietor; he must be made to feel an interest in the soil; and nothing would give more confidence than the revival of the good old custom of granting leases, or that compensation should be paid, in the event of an unwilling removal, for all permanent improvements. The national good which would arise from a general improvement of agriculture, from any general effort made on the part of the tenants to improve permanently, as by drainage—not of waste land, but of that which is already in cultivation—can hardly be over-rated. We could show, by many examples, how much the national wealth has been, and may be further, increased by these means. Take, for instance, the average produce of wheat, which is stated at twenty-six bushels per acre. If, by a small improvement, we could raise the amount to twenty-seven bushels, we should add to the nation's annual income 475,000

quarters; worth, at 50s. per qr., nearly 1,200,000l. yearly from wheat alone. As the population of the United Kingdom seems to be rapidly out-growing the ordinary capabilities of the soil for its maintenance, proving the vast importance of an improved system of agriculture, how desirable it is that the tenant-farmer should have security for the capital he invests in the soil, for no man can obtain the capital necessary to cultivate his farm unless he is secure in his possession. Thus the most industrious and persevering farmers may be crippled, and placed at a grievous disadvantage. The heir may be a gambler or a spendthrift, and how long will he be bound by his predecessor's pledge? Trustees may feel compelled to make the best of the property; or the possession may change hands, and the proprietor do as he likes with his own; or the tenant may give an adverse vote at an election, or his son may have stumbled over a hare; and although a man has obtained all the manure within his reach, drained all his heavy land, limed all his light land, he may have immediate notice to quit, and leave all his improvements behind him. What then becomes of previous agreements which have no legal authority? The despotic, not to say dishonest, principle on which much of the land in this country is let, is the tenant-at-will system, which enables the landlord to put into his pocket by far the greater part of all the tenant's improvements. By the statute law of the land the tenant is punished for dilapidations, but it affords him no protection for improvements. A large expenditure of money is necessary to successful farming, but men will always look for a guarantee in proportion to the outlay. A man who expects to hold his land but

for a year, or to hold only on such conditions as may terminate his tenure at the year's end, will expend so much only as will reimburse him by a year's crop; for all that is expended beyond that might be thrown away; but let a man be assured that his farm will remain to him and his posterity, and he will cast in his whole lot with it; if he be rich and skilful he will cultivate it to the highest point to which the constantly improving state of agricultural science can attain. Such is the importance to the whole nation of the tenant's rights; and it is on this ground that I contend for some modification of the laws affecting landlord and tenant, not merely for the sake of the tenantry, but on public grounds. A great crisis seems near at hand, and it high time that the tenant farmers should exert themselves, in order that they may derive some benefit from the occupation. They were often told, as farmers, that they ought to till the land, and employ the labourer, and do this and that; but suppose we expend our capital in this way to any extent, how do we know what landlords may do, and then what would become of us when called on to give up our farms? If they took farms and improved the condition of them, nothing could be fairer than that they should reap remuneration. The law of landlord and tenant imperatively calls for revision, and the introduction of some measure having for its object the giving the tenant a sort of co-proprietorship in the lands; thus raising him in the scale of society, inspiring confidence in the outlay of capital, securing the employment of an increasing population, and providing food in our country for almost an indefinite number of mankind. In conclusion, I would recommend that in the absence of long

leases, the legislature be called on to pass an act that any farmer, being a tenant-at-will, or under a lease for a less term than twelve years, it shall be lawful for such tenant, on receiving notice to quit, to call in a valuer, and give notice to his landlord to appoint a person on his part to meet such valuer, to assess the amount of compensation due to the tenant for any improvement he shall have made during his occupancy, to the full benefit of which he shall not have received; any lawful claims of the landlord for dilapidations and mismanagement to be deducted; the decision of such valuer or that umpire to be final. Such an act would prevent, to a great extent, the deterioration of land, and benefit all classes of persons. I am not aware that any difficulty would arise in the legislature's interference, and I would call upon all farmers' clubs and agricultural societies to canvass this question, and follow the example of the London Farmers' Club, that some measure may be brought in in this present session of parliament to give the tenant farmer those rights which in justice he is entitled to.

After some discussion on the subject the following resolution was unanimously carried: "That this meeting considers that when land is held merely on a tenancy from year to year, six months notice to quit upon the part of the landlord is much too short; and that as the tenant upon deteriorating the soil is liable to an action for dilapidations, so upon having made improvements they think the tenant should have a remedy against the landlord in case he should have been compelled to leave before he has had time to obtain a just return for his capital expended."

FEEDING CATTLE, SHEEP, & c.

At a late meeting of the Parsonstown Union Farming Society, Ireland, Dr. Waters, an eminent physician, and a gentleman of great scientific attainments, delivered a most interesting lecture on the application of physiology, or the laws of the vital functions, to the rearing and feeding of cattle. We are induced to give an extract from this lecture, in the hope it will prove highly interesting to our agricultural friends, and it certainly contains many facts worthy of their attention. Dr. Waters said—

"The subject chosen for the present lecture was the application of physiology on the laws of the vital functions, to the rearing and feeding of cattle. He did not pretend to any practical experience; in fact, he had none; but should endeavour to point out those principles upon which practice should be based, and which, being once known, would enable the practical man to regulate the application of them in a way best adapted for the purposes intended."

He then entered into a description of Liebig's important discoveries in the processes engaged in the nutrition of animals, pointing out the division of the elements of food of *herbivorous animals* into the two classes, viz., the elements of nutrition, and the elements of respiration.

The elements of nutrition, containing oxygen, nitrogen, hydrogen, and carbon, are perfectly identical with the flesh of animals; so much so, that the most experienced chemist cannot by analysis detect any essential difference between the substance gluten or albumen, which is invariably present in all vegetable nutritious food, and the flesh or blood of an animal. Thus proving the strange fact, that *the flesh and blood of animals exist, really formed, in vegetables*; and the only duty the vital functions have to perform in connection with nutrition, is to assign a place and form in the animal to this food, which is already of the proper composition, manufactured, as it were, in the laboratory of the vegetable kingdom.

The elements of respiration are those compounds from which the element nitrogen is absent, such as sugar, gum, and starch; they consist of carbon, hydrogen, and oxygen, but not containing nitrogen; they, therefore, cannot form flesh, and cannot, in this sense, be considered nutritious. The experiments of Magendie have shown that animals fed *solely* on these substances will die; but as they are invariably present in food, what are their uses? They serve as fuel to keep up the heat of the animal body. The bodies of our animals are always above 40 degrees over the average temperature of our climate, and the supply of heat necessary to sustain this temperature is produced by the union of the oxygen contained in the air

they breathe with the carbon within the body, thus producing the same gas as if a piece of charcoal were burned in the open air—carbonic acid gas; and as a certain amount of heat is the necessary result of burning a piece of charcoal, so when carbon or charcoal unites with oxygen within the body, the amount of heat generated *must* be the same as if such carbon were consumed in the open air, and experiment has proved that the amount of heat thus produced is amply sufficient to sustain the temperature of the animal body.

The most accurate observations have shown that the heat of the blood of animals is the same in all regions, whether at the equator or in the polar regions. The quantity of heat necessary to keep up this uniformity of temperature must obviously vary with the climate. The inhabitants of the Tropics, for instance, can sustain the temperature by a less expenditure of heat, where the surrounding air equals the temperature of the body, than the inhabitant of the Polar region, where the air is 100 degrees colder than the body; but we find that the food in the Tropics is vegetable, containing not more than 10 per cent. of carbon or combustible matter, while the food of the inhabitant of the Polar region consists of blubber, train oil, and tallow, containing 80 per cent. of carbon.

Air is condensed by cold and expanded by heat, so that the quantity of air in a given volume varies with the temperature. The size or capacity of the chest of an animal is a constant quantity, and therefore the volume of air taken in at each inspiration may be considered uniform; hence, in a cold climate more air must be taken in at each inspiration, the air being condensed, than in a warm climate, where the air is expanded; more oxygen is therefore taken in, and as oxygen once taken into the system never leaves it as such, but enters into combination with carbon, so more of the latter must be supplied in cold than in hot climates. Anything, in fact, that increases the supply of oxygen, must occasion an *increased demand for food*. Exercise, for instance, increases the supply by making our respiration more rapid; we therefore consume more food after exercise, than when at rest.

Our clothing is in fact an equivalent for food. The more warmly we are clad, the less urgent becomes our demand for food; because, the loss of heat by cooling, and consequently the amount of heat to be supplied by the fuel or food, is diminished.

Two forces exist in connection with animal life—the one, vitality, the cause of life, which is always endeavouring to sustain and increase the mass—the other, the chemical force, the gas oxygen, always present in the air we breathe, endeavouring to waste and destroy the animal substance, by entering into chemical union with the elements of organic matter. These forces are placed in antagonism. When vitality has the ascendancy, the body increases; when the chemical force triumphs, the result is waste. When the chemical force succeeds in the waste of the body, it resolves it into the elements carbonic acid, ammonia, and water; but these are the very substances upon which plants subsist. Thus, we find death and destruction in one kingdom of nature, the source of life and activity in another.

Cold depresses the vital function (the cause of increase); while, by condensing the chemical force, oxygen (the cause of waste), it increases its power. We, accordingly, find that cattle do not fatten so well in cold as in hot weather. In fact, the animal body is a *furnace*, which must be kept up to a certain heat. The food is the fuel, the air we expire the same as the gases which pass up the chimney; and the excrements are the ashes. This furnace must, therefore, be supplied with more or less fuel according to the temperature of the external air. If, then, we wish to keep up the vital functions of our

cattle in proper action, we must support the heat of their bodies, which we may do in either of two ways, viz., adding more fuel, that is food, to the furnace; or, we may keep their bodies warm. Warmth, in point of fact, supplies the place of food, which we may thus economize. An experiment performed by Earl Ducie at his Whitfield Farm will place this in a clearer light.

100 sheep were folded by tens in pens, each 10 by 22 feet, having a covered shed attached 12 feet by 10. They were kept in from October to March; each sheep consumed on the average 20lbs. of Swedish turnips daily. Another 100 were put by tens into pens of the same size, *but without sheds*; they were kept in during the same time, and consumed on the average 25 lbs. of Swedish turnips daily. The only difference in the treatment consisted in the former having a shed into which they could go to protect themselves from the wet and cold. This protection was equivalent to a certain proportion of food, and we find that those that were deprived of it consumed one-fifth more food. In the latter case, the additional quantity of food arose wholly from the necessity of adding more fuel to keep the furnace at its proper temperature. This is proved by the fact that the sheep that had the sheds increased on the average 3 lbs. each more than the others.

There are many illustrations of this principle, *that warmth is a substitute for food; and therefore by protecting cattle from the cold, we economise food.*

The excess of those principles containing nitrogen is deposited as flesh, while the excess of those destitute of that element, as sugar, starch, &c., is deposited as fat.

The fattening of cattle is similar to the growing of corn plants; we endeavour to produce an unnatural increase of some particular part of the plant, as the gluten of wheat, and this we accomplish by artificial means—by manure. The fattening of cattle is the same. We want to produce an unnatural increase of part of the body; and we do this by putting the animal in an unnatural state.

One of the most remarkable of Liebig's theories is, "that every manifestation of force, every movement is the result of a transformation of the structure of the body or its substance." This may appear problematical in the highest degree, and yet there is no theory more easily proved by every day experience.

Poultry feeders confine their poultry when they want to fatten them, thereby depriving them of motion. Pigs about to be fattened are confined in a narrow sty, on the same principle. Mr. Childers found in his experiments on sheep, that those fed in sheds consume one-fifth to one-half less food, and increase one-third more in weight than those fed in the open field. The cause of this is—first, the sheep in the sheds take less exercise, and therefore exhaust less food in the production of motion than those in the field; and, secondly, the sheep in the sheds have their warmth economized.

We may now endeavour to apply these principles.

The food, as has been mentioned, consists of two sets of elements—one destitute of nitrogen, destined to support the respiration and heat of the animal, the excess converted into fat, but never into muscle; the other containing nitrogen, similar in chemical composition to the flesh and principal tissues of the animal body, first converted into blood, from which the flesh is deposited without undergoing any decomposition.

In estimating the relative value of different foods, these facts must be taken into consideration; and it is, therefore, difficult to express by numbers the equivalent value of the various articles of food. Tables have been drawn up showing the amount of either set of elements in each kind of food, by reference to which it will be seen that their relative values depend on totally different qualities. Thus, potatoes, which contain a large proportion of

those elements destitute of nitrogen, are most profitable for forming fat, but in the highest degree unprofitable for forming flesh; while beans, on the contrary, are profitable for forming flesh, but most unprofitable for forming tallow. It is clear, therefore, that their equivalent values cannot be compared, as their respective value as food arises from totally different causes. We, therefore, see the utility of mixing food to supply, in a small bulk, the element of which any particular article of diet may be deficient.

The form in which food is given to cattle is of considerable consequence. Food difficult to attain, or to masticate, creates an expenditure of force required to bring it into a state fit for the organs of digestion, and, therefore, causes waste of substance, and, consequently, of food to supply this waste. The cutting of hay or straw is thus useful in saving an unnecessary expenditure of force. Steaming food brings it nearly to the same condition as it is reduced by the action of the three first stomachs; and, therefore, force is economized by this process.

The practice of bruising oats for horses is useful on the same principle.

The amount of water contained in the different kinds of food should also be taken into consideration. Tables have been constructed exhibiting the quantity in the more common kinds of food. Thus, in giving an animal 100 lbs. of potatoes, we, in reality, give but 28lbs. of solid matter, potatoes containing 72 per cent. of water. Turnips contain 89 per cent., and beet 89 per cent. of water. When any of these succulent vegetables are taken into the stomach, the watery parts are soon got rid of, therefore a necessity arises for adding food to give bulk to the residue. As rumination is essential to the health of an ox, and this process cannot be carried on unless the food possesses a certain degree of bulk, we find that animals fed on turnips will voluntarily take a certain quantity of hay or straw each day to increase the mass. Cattle fed on meal and boiled potatoes, without hay, have perished on this account. The food did not possess sufficient bulk, the animal was unable to ruminate, and constipation and death was the result.

All cattle feeders are in the habit of giving salt to their cattle, and must have perceived the benefit arising from it. The explanation of this is somewhat complex.

Respiration, as has already been stated, consists in the combustion of the sugar, starch, &c., contained in the food; but before this combustion is effected, those compounds are converted by the liver into bile. The bile is a compound of the alkali soda with a substance derived from the food containing a large amount of carbon. The bile is taken up by certain vessels in the intestines, and being brought into contact with oxygen, is converted into carbonic acid and water.

The mode in which this is effected, is very curious. All blood contains iron. Iron enters into combination with oxygen, in two proportions—the protoxide consisting of one proportion of oxygen to one of iron, and the peroxide containing two proportions of oxygen to one of iron. The peroxide gives up its additional proportion of oxygen with great facility to organic matter; and accordingly, when that contained in arterial blood comes in contact with bile, it is decomposed, carbonic acid is formed, and the iron thus reduced to a protoxide enters into union with the carbonic acid, forming carbonate of iron, which is taken up by the venous blood, and carried to the heart and lungs. In the latter, the carbonate of iron comes in contact with the oxygen of the respired air; but the moment it does so, it is decomposed, oxygen is absorbed, a peroxide of iron is again formed, while the carbonic acid is set free, and is discharged with the expired air. The peroxide of iron again enters the arterial blood, to perform its duty anew, as carrier of carbonic acid to the lungs.

The bile is therefore essential to the perfect respiration of the animal, and to ensure its due formation, a certain amount of soda must be applied. We do this, in giving common salt (muriate of soda)—the soda goes to form bile, while the muriatic acid assists in the process of digestion.

Too much salt will prove injurious, by converting the excess of food into bile, and so preventing the deposition of it as fat.

The delivery of the lecture occupied an hour and a quarter, and was illustrated by numerous tables, explanatory of the subject.

CULTIVATION OF WASTE LANDS.

AN APPEAL TO THE BRITISH PUBLIC, FOR PROMOTING THE INCLOSURE AND CULTIVATION OF WASTE LANDS, FOR THE FULL EMPLOYMENT OF THE POOR, UPON THE FOLLOWING IMPORTANT GROUNDS.

1st. It is the true policy and interest of almost every member of the nation, that the unoccupied part of the population should not only be employed in providing food for themselves, but also in producing it in a much greater ratio, for the other members of the community; thus the more we increase in population, and the more we bring the waste lands into cultivation, the greater abundance we shall obtain from that land and labour which would otherwise be lost to the community.

2nd. It is the true policy and interest of every person paying taxes and poor rates, to diminish the burden individually, by diffusing such over a much greater sphere of population and industry; by increasing the value of rateable property by labour; and by beneficially employing the poor, so as to reduce their claim upon the poor-rates, from their own industry and extended exertions.

3rd. It is the true policy and interest of our agriculturists and manufacturers to cheapen food and to lessen the expense of the labourers' and artisans' support, and increase the comforts of mankind, by engaging a greater part of the population in the cultivation of the waste land, so that we may not only have the productions of both cheaper, but may enjoy all the advantages of enlarged machinery, in the extension of vegetation; the increased uses of animal strength; and in the indefinite applications of steam and mechanical powers.

4th. It is the true policy and interest of each individual, from the most beneficial employment of labour in extending the cultivation of the land, not only to promote the use of the natural productions of our own country, but to encourage and increase the demand for every species of home manufactures; which secures the advantages arising from quick returns of capital, and the least possible risk and expense both to the manufacturer and consumer.

5th. It is the true policy and interest of the whole community to enrich the capitalist and the nation generally, with the continually renewing and increasing gifts of providence, in the productions of the soil to the mother country, where they are likely to be most valu-

able, and where the riches they produce most immediately and most uninterruptedly flow; instead of importing these productions from the soil of other countries, while our own waste lands remain nearly useless, and our unemployed increasing population continue to be a burden upon the industrious.

6th. It is the true policy and interest of all classes of the community to amend the morals, habits, and feelings of the working classes, and the poor in particular, by constantly affording them fresh sources of healthy employment, in cultivating the land, for the full exercise of their industry and ingenuity; raising the abject poor from their degraded state of poverty, idleness, and crime, to work for their support and independence; and in keeping that industry and skill for the home market, by rewards for their perpetual encouragement and improvement, alike beneficial to the rich and the poor, the old and young, and to persons of every occupation.

7th. It is the true policy and interest of the state,

more uniformly to provide in all seasons, an abundance and variety of food, to satisfy the cravings of hunger, and to render a poor man's family a blessing instead of a helpless burden. To avoid the repeated calls for charity, and the present plans of public begging to instruct the poor, and relieve the lowest classes, during bad winters and unfavourable seasons. To produce by agricultural labour and industry, increased comforts to mankind in health, long life, and the full enjoyment of intellectual and social happiness; and thus uniting the slow and sure efficacy of experience to the hasty flights of theory, so that they keep up a continual excitement and check on each other. And,

8th. It is the true policy and interest in a national point of view, to encourage this system of supporting our increasing population, as a bulwark of irresistible strength in times of war; and as the most natural, prosperous, and enlightened means of directing our grand national pursuits, and using our surplus capital, in times of peace. AN EXPERIENCED AGRICULTURIST.

AGRICULTURAL CHEMISTRY.

On Tuesday evening, at five o'clock, Mr. Haywood, professional chemist of this town, delivered in the Cutlers' Hall, Sheffield, before a highly respectable audience, a lecture on the Elementary Constituents of Plants as they exist in the refuse of towns, showing the intrinsic value of such refuse as compared with the various manures now in use, and its importance in agriculture. The following is

THE LECTURE.

In calling your attention to the subject of this evening's lecture, namely, the elementary constituents of plants as they exist in the refuse of towns, it will be necessary for me in the first place to give a brief description of those ingredients of which plants are composed, and generally known as their elementary constituents. In doing this, it must be observed, I am entering upon a subject of the greatest importance, not merely to the agriculturists, but to the prosperity of the nation; for on the presence of these very elements in due proportion in the soil, and on the continuance of such resources as are now available, or can in future be rendered so, is man and all animals dependent for their existence. The sources, then, from which these elements are derived, combined with a knowledge of the quantity each crop requires for its development, and the quantity such sources can supply, will form the most prominent parts of my discourse.

The elementary constituents of plants may be divided into two kinds, namely, the volatile ingre-

dients, or such as are dissipated in the fire when the substance is said to be burned; and the fixed ingredients, or such as remain in the form of ashes when the organic part is consumed: the former are found to consist of carbon, hydrogen, oxygen, and nitrogen, in various proportions; and the latter of phosphates, sulphates, and silicates of potash, soda, lime, and magnesia. Chemists are now pretty uniformly of opinion, that the four volatile ingredients are principally derived from the air, while the latter are derived from the soil in which they grow, or the manures used to supply them.

Carbon, the substance better known in an impure state as charcoal, forms the principal part of all vegetable productions, and may certainly be considered the most important volatile constituents of plants. The quantity by weight of this substance assimilated by the vegetation growing on each acre of land, amounts to about 1600 lbs., the whole of which is derived from the atmospheric air. Carbon is found to exist in the air, in the form of carbonic acid gas, in the proportion of about five parts in ten thousand: this gas consists of a chemical combination of carbon and oxygen, which plants absorb very rapidly by their leaves, and which they decompose under the influence of light, carbon being fixed in their organism, and oxygen again being returned to the air. From the quantity of carbon existing in the air, its constant production from sources I shall shortly explain, and its gradual accumulation in soils where plants are constantly growing, we conclude that nature her-

self has made ample provision for its due supply without the assistance of man. Experiments, too, have verified the conclusion, by showing that the growth of plants is by no means accelerated by the sole supply of carbon as manure, consequently we need not assign any value to this ingredient, as it exists in manure or in the refuse of towns.

Hydrogen and oxygen are two other elementary substances which, combined with carbon form nearly the entire weight of plants: these are derived from water which contains the same elements, and generally in the same proportion as they exist in starch, sugar, woody fibre, and other vegetable productions. The quantity of rain which falls in this country is far more than necessary to furnish these materials to plants; but it has other processes to perform equally as important as the simple supplying of its elements. It is in fact the medium by which all the other constituents are conveyed into the organism of plants.

The processes performed by water in the great laboratory of Nature are indeed beautiful, and I hope I shall not be considered as digressing from this subject if I briefly allude to them. Condensing, as it does, from the state of an invisible gas in the immense fields of air above, it brings down carbonic acid, ammonia, and other ingredients useful as food for plants, at the same time producing an amount of heat which modifies the temperature of our climate. On reaching the soil, providing it is a fertile one, it descends to a considerable depth, carrying with it a portion of the soluble matters, and leaving the surface still porous and permeable to atmospheric air. This water may remain as a kind of subterranean reservoir, or find its way into our rivers by drainage. We may, however, consider that a soil perfectly saturated with moisture exists at a certain depth below the surface, and that a continuous film of water adhering to each particle of soil extends from the surface to this supply. It is well known how rapidly water evaporates at all temperatures, and how great is the quantity given from the leaves of plants, and the surface of the soil by this process, it has been clearly shown that out of the 2,500 tons of water which fall annually in the form of rain, on each acre of land, no less than 1,500 tons again pass into the air by evaporation from the same area. This water is brought from below by the capillary attraction of the soil as it evaporates from above, and by this means the upper stratum is kept moist even in the driest seasons, and soluble manures, which may at one time have been washed down, are again brought to the roots of plants. Evaporation progresses more rapidly during the summer months when vegetation flourishes, as a greater quantity of water evaporates

at this time than generally falls in the form of rain, consequently soluble manures applied at this time cannot be lost by drainage, the current of water, contrary to the general opinion, being from below upwards; in winter months, however, the case is different; at this time not more than one-fourth of the fall is returned in vapour, and the loss of soluble manures by drainage will consequently be great. I would not, however, lead the agriculturist to infer that I am decidedly opposed to the application of manures during the Michaelmas and winter seasons, for I am fully aware that there are many cases where it is absolutely necessary. Farm-yard manure, bones, and a variety of other ingredients in constant use, require the prolonged action of the atmosphere to render them soluble, and in many cases a sufficient quantity is barely liberated for the nutrition of plants. It will be inferred from what I have just stated, that it is necessary that all those constituents which plants require for their development, should be in a soluble state, before they can be of any service to the growth of plants, consequently such as are applied directly in a soluble state, or can be slowly dissolved by the action of rain and atmospheric air, are the only ones valuable as manure; hence it is, that the irrigation of meadows increases their fertility to a surprising extent. The water made use of for this purpose differs very materially from rain water, inasmuch as it contains the fixed ingredients most important for the growth of plants. It must be borne in mind that those meadows most renowned for their fertility are those irrigated by streams which receive the drainage of towns. I may allude to those belonging to the Duke of Portland, at Clipstone, where the stream which receives the drainage of the town of Mansfield, and consequently contains the soluble portions of that drainage in a very dilute state, has converted the above barren sandy district into the most fertile meadows in the kingdom. This land, including 1487 acres, might be considered, prior to the application of this irrigation, the poorest grey sand in Sherwood Forest, being then little better than a rabbit warren covered with heath and furze, and letting for less than 5s. per acre per annum: such, however, has been the effect of this irrigation that its annual value has been raised to 117. 4s. per acre. If, then, dilute manures as they flow in the river Mawn can produce such extraordinary effects, and increase the value of the land 4000 per cent., how much more should we expect from the sewerage of a large town like Sheffield, the number of inhabitants of which exceeds that of Mansfield ten-fold. To give an idea of what might be done, I only need allude to Edinburgh, where the sewerage of the Old Town is made to irrigate a large extent of

poor land towards the sea; the value of this has consequently been raised from 30s. to 40l. per annum, or calculating the whole extent of 150 acres, to 6000l. Why such results are obtained I shall shortly explain.

If we inquire what becomes of the three volatile constituents, carbon, hydrogen, and oxygen, we find the starch, sugar, &c., which they produce is consumed by man and animals for the purpose of producing animal heat; that the process performed in the animal system in producing this heat is similar in every respect to the combustion which such substances would undergo if burnt in atmospheric air, giving rise to the same products—carbonic acid and water, which escapes again into the atmosphere. It is immaterial what changes these substances undergo in the animal organism—they may be converted into oil or fat, but ultimately this process of slow combustion does take place in the system, and they escape; we have, consequently, the same substances generated by the breathing of men and animals as those required for the growth of plants; and whatever be the quantity of carbon, hydrogen, and oxygen consumed by the inhabitants of this country, every particle of these elements is again returned to the air as carbonic acid and water, to supply a succeeding race. In addition to this source of carbonic acid and water, the combustion of fires, candles, &c., furnishes a very large amount—every ton of coal producing about 47,000 cubic feet of gas, a quantity sufficient for the annual demand of an acre of land. The 30 millions of tons consumed annually in this country will, consequently, furnish about 150 cubic miles, which inconceivable amount will be yearly absorbed by 30 millions of acres; hence, the carbonic acid produced from the coal which we burn to-day in the fire, or the bread we consume in our system, may tomorrow be absorbed by plants, and again converted into vegetable matter, its oxygen being set free. A continued circle of changes is thus going on, and the carbonic acid and oxygen in the atmosphere are maintained in one fixed and unvarying proportion.

The next volatile constituent to which I have to call your attention is nitrogen. This forms the principal part of what may be correctly called the nutritive portion of plants, and is consequently the one we should apply to them, in order that they may assimilate it in the greatest possible proportion.

Plants growing in a wild state obtain the whole of their nitrogen from the minute trace of ammonia (a compound of nitrogen and hydrogen) existing in atmospheric air; this is probably absorbed to some extent by their leaves, but is principally condensed from the air, and conveyed to the roots of plants by every shower of rain which falls. It was for a long

time a question whether this source of nitrogen was not sufficient to supply all kinds of produce. Bous-singault, the celebrated agricultural chemist, from a series of experiments carried on for fourteen years, concluded that it was sufficient for white crops which required a certain time to ripen their seed, and that no artificial supply was consequently needed; for green crops, roots, and bulbs, however, the case is different; such plants developed themselves in much less time, and attained a much greater size when supplied with nitrogenous manures than without them. Now, if the quantity of nitrogen existing in one acre of wheat, five quarters per acre, be 56lbs., which is found to be pretty nearly the case, the ammonia which falls annually in the 30 inches of rain, will supply this amount. Liebig, however, has proved most clearly, that the quantity of nitrogen in wheat and other articles of food, viz., the nutriment, may be doubled, or even tripled, by the application of such manures. Now, although, we do not increase the quantity of grain or potatoes, by the simple application of ammonia; if we can increase the quantity of those compounds most serviceable as food for man and animals—yea, if we can make a given weight of bread, or potatoes, contain three times the amount of nutriment they now do, then I say it is of the greatest importance to preserve every particle of those ingredients which can put such a power into our hands. I cannot, however, reconcile myself to the opinion that ammonia does not increase the quantity of grain and other seeds. I have seen a variety of experiments where the quantity of wheat and barley, as well as its quality, was certainly increased to a considerable extent, and green crops probably doubled in amount. It would, in fact, be absurd, in the present state of our knowledge, to suppose that the heavy crops of carrots, cabbages, &c., grown by our farmers and market gardeners, could derive the whole of their nitrogen from the air, or otherwise than from the manures they employ. An acre of carrots, such as they grow, would contain 134lbs., and an acre of cabbage 246lbs. of nitrogen. Now, the main object of agriculture being to produce the greatest possible quantity of produce on the smallest space of ground, these ammoniacal manures become of the greatest importance; and I do not despair of seeing the whole of our cultivated land in England capable of producing double the amount of food it now does, when we learn better than to throw away the only means which can enable it to do so.

Now, let us inquire what quantity of nitrogen is assimilated annually by the crops and animals produced on a farm of 100 acres, under the four-course system of rotation, viz., wheat, turnips, barley, and clover, and what ultimately becomes of it?

From a report I made for the visiting justices of the Derby Lunatic Asylum, I showed that the quantity of nitrogen existing in twenty-five acres of wheat would be . . . 1,360lbs.

Nitrogen, in 25 acres of barley 1,030lbs.

Nitrogen in lambs, calves, horses, &c., produced by the clover, and turnips consumed by them, the rest being returned to the soil in their excretions 291lbs.

Total 2,681lbs. of nitrogen.

The straw resulting from the white crops, and the nitrogen contained in the straw, will be consumed by cattle, or trodden into manure, and again returned to the land, the total quantity of nitrogen not returned being 2681 lbs., as above. Now what becomes of this? Is it not true that it is sold away to support the increasing population of our manufacturing districts, and that you get none back in return? Is it not also true that not only nitrogen, but all the elements necessary to the growth of a succeeding supply of food, and the continued existence of man, are suffered to run to waste; and instead of being applied to the purposes for which they were obviously intended, pollute our streams—support subaqueous vegetation, the putrefaction of which gives rise to noxious gases, which poison our atmosphere—produce disease and death—and if any remain after causing such undesirable effects, they are carried into the ocean, there to be for the most part lost, as far as regards their immediate application to the produce of the soil? Yes; and the quantity thus lost, and the mischief thus effected, even in this town, is inconceivably great.

It is well known that whatever be the quantity of nitrogen contained in the food consumed by a certain number of individuals in a given time, the same weight of this constituent will again be given off in their liquid and solid excretions in the same time; in youths, however, the case is different, a certain portion of this element goes to the formation of flesh; but this is so small in amount, compared with the quantity consumed, that it need not be taken into consideration. Now I find, from a careful analysis of the dietary of your union workhouse, that 100 paupers consume in bread, meat, potatoes, and other articles taken by them, about 1,530lbs. of nitrogen per annum, this quantity will, consequently, be contained in the excretions produced by them in that time; if we assume that each of the inhabitants of the densely populated portion of the town, who amount to 110,000, consume food and give off its elements in the same proportion as these paupers, which must be considerably under

the truth, then have we no less than 751 tons of nitrogen contained in their urine and solid fæces, a quantity sufficient to produce above 30,000 acres of wheat, or to keep more than 62,000 acres in a constant state of fertility on the four-course system of rotation.

Could we ascertain the quantity of these materials which are actually preserved from this town, I fear we should find that instead of their being used for fertilizing thousands of acres, they are barely sufficient for hundreds—the most valuable part, namely, the urine being suffered to drain from the solids and escape into the river. It is well known that in the decomposition which all feculent matters undergo shortly after their expulsion from the animal system, the whole of the nitrogen they contain combines with hydrogen, and takes the form of ammonia; this again combines with carbonic and other acids, generated at the same time, forming carbonate and other salts of ammonia. It is only a few years since chemists were unanimously of opinion that the intrinsic value of manures might be represented by the quantity of ammonia they contained or would yield by decomposition in the soil. Now, although this opinion is proved to be erroneous, we may safely compare the value of the ammonia in this town's refuse, with manures of known value, which can furnish nothing else; and if we take mill waste or shoddy, a manure which can yield the largest quantity of ammonia at the cheapest rate, we shall find its value to be £14,660. This material, which is purchased in large quantity from the woollen cloth manufacturers of Yorkshire by the farmers of Nottinghamshire and Kent, at a cost of about £2 per ton, is found to contain, on an average, about 11 per cent. of nitrogen, or about 250lbs. in the ton. If 250lbs. of nitrogen be worth £2, the 751 tons contained in this town's refuse will be worth the above sum; and being in a better state for assimilation, will be more serviceable to the growth of plants. If we further compare it with the sulphate of ammonia, a manure which is much extolled for its fertilizing properties, and readily purchased at £16 per ton, we shall find it would require 3,581 tons, value £57,293, to furnish the quantity of ammonia contained in this refuse. In the same way we shall find that 14,025 tons of bones, value £70,125, or 8,850 tons of guano, value £88,500, would be required to furnish the same quantity. Is it not, then, absurd in the extreme to allow such an immense source of profit to run to waste, and to expend such immense sums of money in the purchase of manures from abroad, when precisely the same materials can be obtained at home, with but one expenditure of capital? Yes, and it is more than this—it is a tax upon the agricultural interest of this country, which tends more

to keep up the price of bread than either landlord's rents or corn laws. I know many farmers who annually expend more money in the purchase of manures than they pay as simple rent, and such I believe to be the case with most of the large farmers in this country—the cost of their tillage amounting in many instances to £3 per acre. Let such, then, be provided with manures of equally fertilizing quality with those they have hitherto used, at one-half their cost (which can be well afforded if the methods now under consideration be carried out) and you will effect an immense saving in their expenditure, and enable them to compete with the foreigner in any market in the world.

I stated that there were other materials besides the volatile constituents which plants require for their development. These are the fixed ingredients, viz., Silicates, Sulphates, and Phosphates of Potash, Soda, Lime, and Magnesia.

With regard to the silicates of potash and soda, these ingredients are principally found in the straw of wheat, the stems of grasses, &c., in materials therefore not used as food for man, and which, therefore, cannot be contained in his excrements. These compounds are found in all soils in the state of an insoluble gas, in quantities varying from four to ten tons per acre, within the reach of the roots of plants. Each acre of wheat is found to extract from 100 to 140 lbs. of silica per annum, the whole of which is returned to the soil in farm-yard manure. We observe, therefore, that there is a sufficient quantity of this material to supply crops for an indefinite period, the silicates, however, are of such an insoluble nature as to require the prolonged action of the atmosphere before a sufficient quantity can be rendered soluble to supply the plants—hence farmers find it impossible to grow such crops in succession as require silica in large quantity, but to alternate them with green ones, such as turnips and clover, which require none. Potash and soda—without silica—are found in the grain of wheat and other produce used as food for man, and these being constantly removed from the soil in such food and conveyed to large towns, should also be returned to the soil, if we wish to preserve its fertility. The quantity of potash and soda contained in the refuse of this town, deduced from the same data as the former ingredient will be about 537 tons. Now admitting these ingredients to exist in the proportion of three parts of potash and one soda, which will be very near the truth, the value of potash, as compared with its cheapest salt, pearl-ashes, will be 24,000*l.*, and the soda 4,200*l.*

I need but make few observations on lime and magnesia, as they are ingredients of little value, and generally form a considerable portion of all

fertile soils. Some soils, particularly those of a porous nature containing much humus, and from which the lime has been removed by the carbonic acid contained in rain water, require its restoration to the amount of about half a ton per acre annually. Lime, however, does not act so much as a manure, as it does as a secondary agent in promoting the decomposition of the silicates, and rendering them soluble for the use of plants. Stiff clay soils and others containing a large quantity of silicates, are those most benefited by the application of lime. All soils intended for the growth of wheat and other crops requiring silicates, demand its occasional application. Lime is found in considerable quantity in all our cultivated crops, either combined with acids generated by the plants themselves, or with others, such as the sulphuric and phosphoric, already in combination in the soil.

The sulphate of lime, or gypsum, as it is called, enters largely into the composition of clover and other plants, and is one of the constituents of the food of man, being absolutely necessary to his existence. The sulphur contained in this sulphate, is an important constituent of all cruciferous plants, such as turnips, cabbages, &c., and without which they cannot come to maturity. This sulphur exists in the pungent essential oil of their leaves, stems and flowers, and is very liable to be transferred to butter when cows feed upon them. It is from the decomposition of sulphate of lime alone, I believe, that plants naturally acquire their sulphur, and this being contained in minute quantity in most soils, an addition is absolutely necessary to keep up their constant fertility. Gypsum, the material generally employed, is purchased for about 30*s.* per ton. Now the quantity contained in the food and excretions of the inhabitants of this town, amounts to about 50 tons—consequently will leave an annual value of about 75*l.*

By far the most important compounds, however, and those to which I would most particularly direct your attention, are the phosphates;—these are assimilated by plants for the purpose of supplying bones to animals, their bones being composed principally of phosphate of lime. Phosphates are also found in the blood, muscle, and brain of animals, and may certainly be classed amongst the most important elements of their existence. Wheat, peas, beans, hay, and all vegetables on which animals can live contain these phosphates in considerable quantity. On analysing the ashes of wheat we find that each acre of 5 qrs. contains about 27 lbs. of phosphoric acid, equivalent to 56 lbs. of phosphate of lime, or about 100 lbs. of bones. An acre of barley, 5 qrs. per acre, contains about 17 lbs. of acid, equal to 62 lbs. of bones. One acre of turnips, 20 or 25 tons per acre, contains 25 lbs. of

phosphoric acid, equivalent to about 92lbs. of bones. These, however, are not entirely removed from the farm on which they grow, being consumed on the land by sheep, or in the farm yard by cattle, it is consequently only such portions of their elements as become parts of the animals consuming them, which are entirely removed, the remaining portion being returned to the soil in their excretions. From observations carefully made on the quantity of phosphates annually removed by a certain number of lambs, young horses, &c., from a farm of 100 acres, I find it would be as follows:—

	Bones.	
	Lbs.	Lbs.
Phosphoric acid in the bones and flesh of 110 lambs, weighing 25lbs. each, sold at 6 weeks old	145	537
Phosphoric acid in 40 year-old sheep, weighing, with skin, &c., 90lbs. each	210	777
Phosphoric acid in 4 calves, sold at 5 weeks old weighing altogether 500lbs	21	77
Phosphoric acid in 4 young cows forming 140lbs. of flesh and 35lbs. of bone each per annum	16	23
Phosphoric acid in two young horses, gaining the same as the last	21	77
Total	439	1623

We should consequently export from a farm of one hundred acres, by 50 acres of white crops, 50 acres of green, by 110 young lambs, 40 yearlings, 4 young calves, 4 young cows, and 2 horses—1,549lbs. of phosphoric acid, equivalent to 5,737lbs. of bone.

Now let us inquire whether there is a sufficient quantity of phosphates in our cultivated soils to meet this demand for an indefinite period, and whether there is not some danger of the whole becoming exhausted, and our land going out of cultivation in consequence.

Taking the average of 20 soils of various characters which I have analysed from Nottinghamshire, Yorkshire, Lincolnshire, and Derbyshire, I find that the average quantity of phosphoric acid combined with various basis in the soil, does not exceed 5 cwt. in the acre, one foot deep. Now, although this may appear to be sufficient for our present demand, yet when we consider that 15lbs. weight is annually removed from this extent, it is evident that the above quantity would not last 40 years. This gradual extraction of the phosphates has so exhausted some of the grazing lands in Kent,

by the exportation of them in cheese, that the grasses were found incapable of producing cheese any longer in consequence of the deficiency. On the restoration of these ingredients, in the form of bones, however, the land regained its original fertility, and nutritive grasses were again produced. It, no doubt, will be thought by some that the artificial tillages now in general use are amply sufficient to restore what is taken away, and judging from the large quantity of bones expended on many soils in this neighbourhood, such will naturally be the inference; but we must not look at things as they exist in a mere local district—we must not imagine that because this gentleman or that has put two or three tons of bones on every acre of his land within these last ten years, that every agriculturist in the country has done the same,—we must look at things on a more extensive scale, and inquire into the sources of these bones and all other available tillages, before we can state positively that they are sufficient to keep up a continued supply. I have shown before that the quantity of phosphates extracted from the soil in the bones and flesh of animals bears but a small proportion to that extracted by other causes, amounting, in an arable farm of 100 acres, to 439lbs., while the latter amounts to 1,110lbs. Now, if we collect every particle of these bones, and again restore them to the land, it is evident that we should only supply a quantity of phosphoric acid that would produce an equal amount of bone the succeeding year, while none would be added to supply the growth of wheat. Seeing, therefore, that the bones in this kingdom can only furnish phosphates for an equal weight of bones the succeeding year, let us see how the phosphates are to be obtained for restoring the exhaustion by wheat and barley. It is clear that the materials to do this, must either be imported from abroad, contained in a mineral state in our own country, or every particle of excrementitious matter must be preserved which contains them.

First, as to the manures imported from abroad. We have bones and guano—the latter, however, is acknowledged to be so nearly exhausted, that I scarcely need allude to it; of the former, we have sometimes imported as much as forty thousand tons per annum. Now these bones contain little more than one-fourth of their weight of phosphoric acid, which consequently will be 10,000 tons, and this would but restore the phosphates to 1,500,000 acres of land. Now admitting the annual importation of phosphates in cheese, cattle, seeds, fish, &c., to be double this amount, and that the whole of these ingredients are preserved, we have but sufficient for 3,000,000 of acres, the remaining 10,000,000 being perfectly dependent on our own resources.

And what are these resources? What becomes of these phosphates which are annually extracted from our soil by our corn and cattle? Are they not exported into the large towns to be consumed; and after performing certain functions in the animal organism, to be given off in the liquid and solid excretions of its inhabitants; and are not they, alike with the nitrogen and other valuable ingredients, suffered to escape into the sea? Yes; such, indeed is the fact; for out of the whole excretions made by the inhabitants of this town, only about one-half of the solid, and scarcely any of the liquid—which is by far the most valuable—is preserved; so that we may estimate the loss of phosphates in this and all large towns in England, at three-fourths of the entire quantity consumed in their food. Now, from the dietary of your union workhouse, I find that 100 paupers consume, in the various kinds of food during the year, about 1103 lbs. of phosphoric acid, which gives, in the same ratio, for the whole inhabitants of Sheffield, 541 tons, which would supply about 86,000 acres. We have seen, however, that but one-fourth of the ingredients are preserved, consequently but 20,000 acres can at present be supplied; and for the whole of England, calculated in the same way, no more than 3,273,300 acres, which is only one-fourth of the quantity of land under cultivation. The native bones, however, will supply 4,614,600 acres. The imported bones 1,500,000 acres; and imported seeds, &c. 3,000,000; hence we have a sufficient quantity of these ingredients to supply 9,114,600 acres, or about two-thirds of the quantity of land now under cultivation, and consequently capable of supplying only two-thirds of the phosphates extracted annually by our four-course system of farming. It is clear, therefore, that we are losing 5 lbs. of phosphoric acid every year from each acre of such land; and if this waste is suffered to go on, our 5 cwt. will be exhausted in 112 years, and the whole of our land must go out of cultivation. This does not include any of the meadow, pasture, or wood lands, from which phosphates are extracted in a similar way. I am fully aware that many persons will think lightly, and perhaps carelessly upon this subject, in consequence of there being no fear in their own day: but I think it is the duty of every man to promote, as far as possible the welfare of the race which is to succeed him. I also think one of the greatest benefits he could confer upon them would be to insure, to them a due supply of their daily bread. In a moral point of view, then, the case is obvious, and it becomes the duty of every man and every nation to preserve every particle of those manures which can in any way contribute to increase and maintain the supply of the necessary elements of life.

In the present arrangements in our own country this duty is recklessly neglected, and we are compelled to have recourse to the productions of other countries to supply what we might get at home at a trifling cost—for it is quite clear that were we to preserve the whole of the excretions made by individuals during their lives, we should preserve the whole elements of the food they have consumed, except the portion which the grave receives, which is a mere fraction of that consumed during their lives, and would be more than made up by articles of food imported from abroad. These elements, if again properly applied to the soil, would produce food enough for a second year's supply, and so on *ad infinitum*.

We have already estimated the value of the nitrogen, alkalis, &c.—we will now see the value of the phosphoric acid. The cheapest ingredient that can be employed to furnish this material, and the one generally used is bones—these, as I have repeatedly found, from the examination of many samples, but seldom contain more than one-fourth of their weight of acid, and selling as they do for £5 per ton makes the value of the phosphates in these no less than £20 per ton, and the 541 tons in the refuse of this town will have an annual value of £10,820; or, compared with guano, a value of about £26,800. Why, then, should we yearly expend £400,000 or £500,000 in the purchase of manures from abroad, when the expenditure of such a sum in our own towns would put us in possession of a lasting supply. The intrinsic value of this refuse of towns should be compared with guano, a manure which it closely represents, and each ingredient in this guano must be valued at the lowest price it could be purchased for from other sources:—

The phosphoric acid as compared with bones, deducting the value of the nitrogen in bones	£8,867
Nitrogen as compared with shoddy ..	14,964
Potash and soda compared with the cheapest salts.. .. .	28,221
Gypsum	75
	—————

Total value of the whole ingredients in the refuse of Sheffield £52,927
 Of this about one-half, including the whole of the phosphates, admits of being converted into a portable form; and will have greater fertilizing powers than £27,000 worth of guano, and will certainly sell for the same sum in the market; the remainder might be distributed to the surrounding country in pipes, and used for irrigation, and would certainly prove more serviceable, after the powerful ingredients had been in a great measure removed, than if they were allowed to remain. The graziers in

the neighbourhood of Edinburgh are obliged to make pools in their fields to allow the phosphates to subside, before they irrigate with the liquid. Besides, the above quantity of ingredients having been shown to be sufficient for 100,000 acres of land, it would therefore be wasteful in the extreme to apply them to a few hundreds in the immediate neighbourhood of the town. There will be quite sufficient remaining, after the liquid has undergone a simple chemical process, to furnish the necessary ingredients to them. I may remark that the process proposed to be used in the case is exceedingly simple and cheap, and in addition to the separation of the various ingredients which it will effect, it will at the same time destroy, in a great measure, the disagreeable odours and exhalations given off from such refuse. No fear, consequently, need be entertained on this head.

In conclusion, I trust I have shewn in as simple

a manner as the subject will allow, of what importance the refuse of towns is, not only to agriculture, but to the country at large. I have shewn you that in order to maintain the fertility of the soil, it is necessary to restore to it in manure what we take from it in produce, and that from the present domestic arrangements it is impossible so to do. The land must sooner or later go out of cultivation if this system is allowed to continue. I have shewn you that the only way of restoring what we take from a soil is to return back the town refuse which we take from it; and that undertakings of this kind, not only in this town, but in others, must be attended with great advantage to the projectors themselves, and of great permanent benefit to this country.

After a number of remarks by various gentlemen present, a vote of thanks to Mr. Haywood for his lecture was passed unanimously.

ANNUAL MEETING OF THE WAKEFIELD FARMERS' CLUB.

On Friday, January 9th, the annual meeting of the Wakefield Farmers' Club was held in the saloon of the Corn-exchange.

Mr. Charnock's patent machine for making draining tiles was exhibited in the room. Several gentlemen connected with agriculture were present, and took a prominent part in the proceedings of the meeting. Previous to the business commencing, about 90 farmers of the surrounding neighbourhood sat down to dinner.

The chair was taken by W. E. Johnson, Esq., president of the club, and was supported on his right and left by John Brakenridge, Esq., Matthew M. Milburn, Esq., secretary of the Yorkshire Agricultural Society, McHelton, Esq., and several other influential gentlemen. After the withdrawal of the cloth, the chairman proposed "the Queen."

The following officers for the ensuing year were proposed and elected:—

President, T. C. Johnson, Esq.; Vice-President, A. Lees, Esq.; Hon. Secretary, Henry Briggs, Esq.; Committee, W. Hislop, W. Barratt, T. Bayldon, J. H. Charnock, Jno. Dawson, E. Sykes, Jno. Wood, Jno. Moore, Jno. Heanley, Joseph Whitaker, W. M. Charlesworth.

Mr. BRIGGS, secretary, then read the report.

REPORT.

At the termination of one year and the commencement of another, in the career of the Wakefield Farmers' Club, it becomes the duty of your committee, on resigning their office into your hands,

to submit to you a short report of the progress which the society has made during the session just closed, to bring forward a statement of its funds, and to take a prospective view of its proceedings for the future. It is with great pleasure that they are enabled to announce an increase in the number of members since the last annual meeting, of nearly thirty per cent—there being now ninety-eight on the books, against seventy-seven twelve months ago, making an increase of twenty-one. The number of new members, admitted during the year, were twenty-five; but in that period, your committee regret to say, that three of the old members have been removed by death, and one has resigned. Of the present ninety-eight, seven are honorary members, contributing 20s. per annum; and the remaining ninety-one are ordinary members, at 5s. per annum. The attendance at the monthly meetings, during the past year, your committee are sorry to say, have not increased with the increase of members, the average having been only twenty-one, which is less than the average of the previous year; but as the books in the library have been more eagerly read, they trust that much valuable information has been diffused, which, like good seed, may bring forth a rich and abundant harvest; and they are willing to hope, that as the knowledge of the usefulness of the society extends, a greater and more tangible appreciation of its excellencies may be evinced, by members attending to hear and contribute to the discussions which take place at the monthly meetings. In order to give some idea

of the nature of those discussions, your secretary has drawn up a condensed report of the subjects brought forward during the past year, with the opinions thereon expressed by the members present, which, with your permission, he will read to you. These communications have been eight in number, and have been contributed by six members, namely—two by Mr. Dawson, two by Mr. Briggs, one by Mr. Stringer, one by Mr. Char-nock, one by Mr. Heanley, and one by Mr. Lees. It would be invidious for your committee to offer any critique on the papers and communications with which the club has been favoured, but they think they may, without impropriety, direct your particular attention, in the report of proceedings, to the subject introduced by Mr. Stringer, "On Leases and Corn Rents," the discussion on which, excited so great an interest, as to be extended to three successive meetings. Your committee are happy to announce that the finances of the club are in a flourishing condition; of which the follow-ing is a condensed statement:—

	£.	s.	d.
Balance in the hands of the treasurer..	38	3	0
Arrears of subscriptions and forfeits ..	10	12	0
Subscriptions for the present year	29	15	0

Making a total of ways and means for 1846..... 78 10 0

The estimated expenses of the society for the present year, will be as follows:—

	£.	s.	d.
Use of club room and saloon.....	4	13	0
Postage of circulars, about 3s. 6d. per month	2	2	0
Cleaning the club room	0	10	0
Printing circulars.....	2	12	0
Cartridge paper and calico for covering books.....	1	0	0
	<hr/>		
	£11	17	0

Leaving the sum of £66 13s. to be spent in books or in other modes of contributing to the usefulness or the society.

The additions made to the library during the past years have been books to the value of £6 12s. only; but your committee trust that in the course of the present year, as the funds are in so flourishing a state, members will take the opportunity of recommending for admittance any standard works on agriculture, or connected therewith, that it may be advisable to place on the shelves of the club.

On taking their leave, your committee beg to express the deep interest which they feel in the success and well being of the Wakefield Farmers' Club, and trust that its merits may henceforth be so duly appreciated, as to render it one of the most

useful institutions of the country, by promoting and encouraging the production of plenty throughout the land, without which even peace itself cannot adequately shed her benign influence.

Mr. BRIGGS then read an account of the monthly proceedings of the club, but as most of them have appeared in our columns, we only make one extract as follows:—

"July 18. The ordinary business of the club then proceeded, and Mr. H. Heanley was called upon for his promised paper, 'On the advantages of the application of steam power to farming purposes'—and he read as follows:—'Steam power is one of those mighty agents which have advanced the manufacturing, the mining, and maritime interests of our country to their present proud position. Why is not the same powerful assistant more generally applicable to agriculture? The use of machinery in agriculture is to produce a cheaper description of labour, with the advantage of enabling the farmer to expedite all his operations by a cheaper arrangement than can be done by manual or horse power. To show the advantages of that principle look at the benefit which the farmer derives from erecting a thrashing machine, to be worked by steam-power, in preference to horse-power; the cost of thrashing by the latter, at a moderate computation, being 5d. per load of three bushels, and by the former only 3d. per load, causing a saving of 2d. per load, as an experience of two years has abundantly shown. A great saving also accrues in grinding food for horses, cattle, and pigs; and in the facility afforded in chopping hay and straw; and in steaming the food previous to being given to the animals. Mr. Heanley also enlarged upon the benefit arising in several ways in being able expeditiously to thrash out the corn immediately on its being carted from the field, by which interest of money is saved; and a greater measure of grain secured; as it appears from the observation and experience of practical men, that corn, when kept in the stack for some months, loses weight and measurement, and the quantity of meal and flour is seriously diminished. It has been urged that the straw is deteriorated for food for cattle when not thrashed immediately before being given; but Mr. H. maintained that when made into stacks, its virtues are preserved unimpaired. The advantages of steam-power are as follows:--1st, cheapness, being little more than one-half of horse-power; 2nd, always being able to have a supply of meal, without being dependent upon the miller; 3rd, being able to grind all the small corn and seeds of weeds for pig-food; 4th, being subject to less loss or waste in grinding them, by sending to the public mill; 5th, the engine and machinery are so simple and easily managed; that any tolerably steady man

or farm labourer can superintend the work, the cost of dressing the millstones being only about 6s. per annum; 6th, by chopping the hay and straw which is given to the stock in the yard, a great saving is effected, and many persons are of opinion that straw for bedding is even more valuable when cut or chopped, the decay being thereby hastened; and 7th, the steam, when the engine is of the high pressure construction, can be used for steaming food, after it has performed its work in the engine.

“The calculation of the relative cost of thrashing by steam-power and by horse-power, Mr. H. stated as follows:—

BY STEAM POWER PER DAY.

	s.	d.
3 men at 2s. per day	6	0
2 women at 1s. per day	2	0
2 boys at 6d. and 8d. per day.	1	2
Oil for machine and engine	0	10
Coals and slack	1	6
Wear and tear of engine.	3	6
60 loads, or 180 bush. per day, costs 3d. per load	15	0

BY HORSE POWER.

3 men at 2s. per day	6	0
2 women at 1s. per day	2	0
2 boys at 6d. and 8d. per day	1	2
Oil for machine	0	4
8 horses at 2s. each	16	0
60 loads, 180 bush. per day, cost 5d. per load	25	0

The cost of a steam-engine and thrashing machine, fixed ready for work, is £125

The cost of an eight-horse thrashing machine complete. £90

Extra prime cost of steam-power £35

which, at the rate of 1,000 loads thrashed per annum, would be amply repaid in four years.”

Mr. JOHNSON expressed his great pleasure in having heard the subject so ably treated, and perfectly coincided in the opinion expressed by Mr. Heanley, of the advantages in the application of steam-power to thrashing, grinding, chopping, &c.

Mr. JOHN DAWSON thought that steam-power, so applied must be highly advantageous. He could easily conceive that corn thrashed out immediately on being housed, would be more in quantity as it must then contain more moisture. He also noticed the advantages of steaming food for cattle, as dry food is apt to distend the stomach, and by grinding the corn for horses and cattle, they derive more sustenance from it.

Mr. ANDREW said that he really thought the advantages of using steam in agriculture, both as a motive power, and in other ways, were greater than

is generally imagined. He calculated that a horse, on the average, cannot last more than 15 years, whilst an engine, with moderate care and attention to necessary repairs (which are only slight when taken in time), will last 100 years. Horses, whether working or not are expensive in their keep; but when an engine stands still it costs nothing. A large boiler he considered more economical than of the size that is generally erected, and is attended with less risk. He said that what is commonly denominated a four-horse engine would do more work than eight horses yoked at the same time, for they are never all of one mind in pulling together; whereas an engine is steady at its work, and its whole energies are applied at once. He recollected, in his capacity of a colliery manager, employing eighteen horses to perform some work, that is, six at a time, in three companies, relieving each other as they required it; but it proved very fatiguing work. He afterwards erected a six-horse engine, and performed the same work well. Ten per cent. per annum upon the prime cost of an engine, Mr. Andrew said, would keep it in repair, when well used—even if working every day for 20 years; but the repair of one used for farming purposes, which does not work every day, might be covered with 7½ per cent.—say 5 per cent. for the interest of outlay, and 2½ per cent. for wear and tear. In whatever way steam power is employed, it is the cheapest and best way of getting work done, and done well. But, Mr. Andrew added, he believed a portable engine, on wheels, might be made extremely useful, as it could be applied to work in various places; for instance, it might be used in the field to thrash out the corn there, immediately on its being reaped; it might be used for irrigation, or for distributing liquid manure, by means of flexible pipes; and might be made available in several other ways.

Mr. J. WHITAKER said that he could not help concurring with what had been previously said, but that he conceived it would not pay to any farmer who occupied less than 150 acres.

Mr. GREAVES also agreed with the preceding speakers, and said that he had lately devoted his attention to the use of steam-power for grinding and chopping food for his colliery horses, which he found to effect a great saving.

Mr. J. MOORE thought that farmers occupying even less than 150 acres might advantageously make use of steam-power, employing an engine of two-horse power. He so approved of the principle that he was erecting a steam-engine and thrashing machine, of an improved description, on his own premises, and would continue to make improvements as circumstances dictated.

Mr. BARRATT expressed his pleasure at the discussion which had taken place, and asked what had

contributed so much to England's present elevated position in a commercial point of view, as the application of steam to manufactures? He would say success to the manufacturers of England, because amongst other benefits to be derived from them, an extensive trade is sure to benefit the farmer in the enhanced prices and increased demand for his produce. He did not mean to say that he thought steam-power could do so much for the farmer as the manufacturers and the traveller; but that, if connected with other improvements, it would enable the farmer to triumph over the threatening aspects of free trade in corn. Let the dormant energies of the country be roused on this point, and he repeated his conviction that farmers had nothing to fear. He said he was not an enthusiast in steam-farming, but when he contemplated the saving to be effected by thrashing, chopping, and grinding by steam-power, amounting, he imagined, to 15 per cent., and keeping of horses and cattle on steamed food, saving other 10 per cent., he should say that the sooner the application of steam and steam-power became general, the better will it be for the country.

The following resolution was the result of the discussion:—"That in the opinion of this meeting Mr. Heanley has treated his subject in a very lucid manner, and practically illustrated the uses and advantages of the application of steam-power to agriculture."

The following new members were proposed and admitted:—Messrs. Carr, J. Hicks (honorary), — Pope, — Bottomly, — Child, W. Long, — Saville.

The CHAIRMAN then proposed—"Success to the Wakefield Farmers' Club," and he could only congratulate them on its present improved state. He called upon Mr. Lees to respond to the toast.

Mr. LEES said—He felt great pleasure in responding to the toast. It was only within the last few years their society had arisen, and it was a gratification to him to find that from small beginnings it had become what it now was. It was only by farmers congregating together that they could gather that information which would do them good, and which they required. The society, when it first met, only comprised twelve individuals; and the large number met on the present occasion must be gratifying to those who laid the ground-work. He had great pleasure in proposing—"Success to the Yorkshire Agricultural Society," and accompanying with it the name of its respected secretary, Mr. Milburn.

MATTHEW M. MILBURN, Esq., said—He was highly pleased with the kind notice they had taken of the Yorkshire Agricultural Society, and also the kind manner in which his name had been mentioned. He trusted their meeting at Wakefield

next year might be successful. It was suggested at the last meeting at Beverley, that, as a Yorkshire society, we should come into the large emporium of manufactures of which Wakefield is the centre; and coming as we do amongst a large body of agriculturists, that meeting will be the most triumphant, in every sense of the word, our society ever had. It is not only the spirit and the modes of farmers' operations we wish to see; but even to see, as we did, at the neighbouring town of Doncaster, a farmer come from Wakefield and take the prizes. We see one railway offering to carry our implements one way for nothing, and then another comes and offers to take them both ways for nothing. Last year, at Beverley, we were able to offer £600 as prizes; and we are coming this year to Wakefield, and intend offering £800. He was delighted with the report he had heard read of the Farmers' Club. He was persuaded it was by institutions such as these that the farmers could alone be benefited. He would have every market town in the kingdom possess a Farmers' Club, but not exactly similar to the one in Wakefield. He would have them so constituted that the farmer could state his experience; he would have that experience all collected and embodied in some county society; he would have them carefully edited and printed; and then all combined in one great central society. He would have them circulated, not in hundreds or even in thousands, but in tons, and in such a way as to reach every home and every farm in the kingdom, so that all the farmers of the country should be combined in one common object. He had a toast put into his hand, but would not propose it until Mr. Briggs had finished reading the report, when he perhaps should again trouble them with a few observations (*applause*).

Mr. BRIGGS having finished reading the report.

Rev. G. A. WALKER rose to propose—"That the report be adopted, printed, and circulated amongst the members."

Seconded by Mr. C. D. ATKINSON.

Mr. MILBURN again rose. The committee had put in his hand a tract which might be considered as wishes of prosperity to two twins. They were not twin lambs, or calves, but he believed they might be called Siamese twins. He alluded to the union of agriculture with commerce. We never need be under any apprehensions or fears from the union of these twins. They both depend for success upon their union. We must not attempt to support the one to the detriment of the other; but they must go hand in hand, and heart in heart, as belonging to the same one, good, and great family. A blow levelled at one, is levelled at both—if one suffers, both suffers. "Let us then," said the speaker, "unite to keep them united, as they ever

ought to be together." Mr. M. gave "Health and prosperity to those inseparable Siamese twins, Agriculture and Commerce."

Mr. MORTON rose to respond to the toast. He thought the comparison of the last speaker somewhat unfortunate, for he believed the Siamese twins referred to, never had had a healthful existence. But he did believe that the proper union of agriculture with commerce would produce such a healthful state of things as the Siamese twins never experienced. The former speaker had, in some measure, frustrated him in his speech by mentioning the union of agriculture with commerce. He had often thought whether agriculture should be placed upon the same footing as commerce, and whether such a subject was admissible for discussion at their meetings. He had asked whether such a matter was proper for discussion—whether the principle which we call protection, was or was not admissible (*murmurs*). We ought to be at liberty to discuss such a subject at a Farmer's Club. We are not, I hope, like the members of the American Congress, who, when a member brought forward a motion for liberating the slaves, passed a resolution that no member should be allowed to introduce such a motion again. True, there was a rule which excluded all political discussions. But he thought they might be at liberty to discuss such a subject, as whether protection was the bane or the antidote of agriculture, he would ask the meeting whether protection was good or bad for agriculture, and he was confident there was no man of intelligence who would run away from the discussion of such a question. The question was one which related to the economy of agriculture. It resolved itself simply into the economies of agriculture. It was only bringing in a subject of agriculture, and was a legitimate subject for discussion. There were other associations in this town. There was the coalmasters' society of the West Riding of Yorkshire. They admitted for discussion all subjects connected with fiscal duties. There was also the Polytechnic, which discussed all subjects connected with geology, never shrinking from any. He would ask why not introduce such a question as he had mentioned; for it was a great reflection on the farmers to say they could not discuss such a question without losing their tempers. They could discuss questions of draining, of leases, and of steam power; and from all he knew, he thought the engine would not rise to an undue pressure, or break through the rules of propriety. He did not think they were afraid to discuss such questions. He had a toast to propose, in which he was quite sure they would be all unanimous. He concluded by proposing the health of "their President, with their thanks for his valu-

able services during the past year,"—Three times three, and cheers.

The CHAIRMAN in returning thanks said, he believed that his services, if weighed in the balance, would be found wanting. He was a friend of the working farmer, and trusted he might ever be found so.

The CHAIRMAN then gave the toast—"Liberal landlords, and may it be met with a similar spirit on the part of tenants," coupling with the toast the names of Thomas Wentworth Beaumont, and John Brackenridge, Esqs.

Mr. BAYLDON said he had no fault to find with his landlord. He had been a tenant for many years, and drew his first breath upon his estates. There were some who had denominated him (Mr. Bayldon) as the father of the club; but he always said that if he was, there were many of his sons who cast him into the shade.

Mr. BRACKENRIDGE assured them that he felt proud in having his name coupled with the term liberal landlords, and more particularly with Mr. Beaumont's. Without liberality on the part of landlords, there could be but little to encourage the enterprize of tenants. Landlords ought to be the first in the movement. Their chief time and attention should be devoted to the management of their estates. Looking at their property, they should adopt those means which shall induce the farmer to introduce the principal scientific improvements on his farm. Without the landlord assists his tenant there is no scope for him to employ those effective implements now found to be essential for proper cultivation, and for drawing forth the productive power of the soil. Looking at an estate, the arrangements should be sufficiently extensive as to enable the occupier to carry on his operations to his own advantage. He should also provide the tenant with large granaries and beast-houses, together with tanks, and proper places for the secretion of manure, the value of which is now becoming appreciated. He concurred in general in the application of manure. He highly prized it, when applied to land which had been brought into a state of cultivation, and well stocked. He did not recommend the application of liquid manure. But still manure was quite essential to bring out the productive powers of the soil. Tanks should be provided at the expense of the landlords. The next thing is, good roads should be provided. At Dumfries, it is stated, on one farm, on which eleven horses had been kept, that after good roads had been made across most of the fields, nine horses were found to do the same amount of work which it before took eleven to perform. He hoped good roads would soon be appreciated by the farmer. Then follows a good system of draining. This the

landlord should do, and as a return for the expenditure of his capital lay a charge upon the tenant. With respect to leases of land, they cannot expect men of intelligence and capital as their tenants, unless they grant them a lease. He was decidedly favourable to leases renewable every five years. Himself and Mr. Johnson made an agricultural tour in the county of Norfolk, and could not help contrasting the land there with what it was in some other counties. The fences, stock, and implements, as contrasted with the tenant farmer, under those, who, in other respects, were considered as kind and generous landlords. It would be invidious to mention names, but there certainly was a great difference between what they witnessed in some other counties. In the county of Lincoln they saw the same excellence in some cases as they did in Norfolk, although the system of leases were different in the former county. It was, however, quite necessary, to insure the productive powers of the soil being fully brought out, that some security of possession should be guaranteed to the tenant. There was nothing so congenial to human enterprise as the cultivation of mother earth, and nothing so grateful or pleasing, or beneficial to our happiness. Leases should not be fixed too high. In speaking of liberal landlords, accompanying the enterprise of tenants, is quite reasonable. He expects the tenants will cultivate his land, and will carry out his reasonable expectations. Farming was looked upon as a commercial speculation, and the enterprising man found it was to his interest to do so. As an inducement to farmers to extend their knowledge of agriculture, Mr. Johnson, Mr. Briggs and himself, proposed the establishment of this society, and it gave them great pleasure to find it had been so successful. It showed they valued the information brought before them in discussion; and by the comparison of our ideas with the experience of others, a beneficial result had been the consequence. He did think the general result had been satisfactory. He had seen a copy of a report taken before the Agricultural Committee of Parliament in 1837-8 of the average produce of wheat in Great Britain. England gave to every acre of land 21 statute bushels; whereas Scotland gave 25 bushels; and Ireland, although the land was much richer and more fertile than either of the other two countries, gave only 7 bushels per acre. He did think they might bring up the average of England to that of Scotland. The valleys and lands of Scotland were certainly very rich; but he thought that by the application of industry and proper means Ireland might be made to outstrip either of them. He was not favourable to the introduction of politics at their meetings. They ought not to convert an agricultural club into a political arena. They might discuss the connection between commerce and agri-

culture. He had a toast in his hand, which he proposed with great pleasure—"Success to the Town and Trade of Wakefield." He hoped the trade in Wakefield would continue to increase, and become one of the most important towns in the neighbourhood. With this toast he begged to connect the name of Mr. Wm. Barratt.

MR. BARRATT disliked useless apologies, yet he would say the toast he had to propose had fallen to the lot of an humble individual. Wakefield was by no means a large town, and could not claim to be considered as a place of great importance. He looked at Huddersfield, Halifax, and Leeds, and asked how it was Wakefield did not take the lead of all these towns? There was everything in Wakefield calculated to its advantage. There was no town in the county of York possessing greater river or canal accommodation, and connected with those running into every part of the kingdom. It had also minerals and coals in abundance, capable of giving employment to all the steam engines of Leeds Huddersfield, and Halifax. It was also advantageously situated for warehouses. He was glad to hear from Mr. Milburn, that while other towns had had £600, Wakefield was to have £800 expended in prizes. But a few years ago, this society had no existence; now it had extended to nearly one hundred members. Commercial men are the most enterprising farmers; for they well know the soil is a grateful thing. He was looking to farming rising still higher than it was. Many thought that farming operations in England were at the zenith. But irrespective of anything like prejudice, he was looking forward to the time when England should be what Scotland now is. A short time since, Scotland went abroad for the very "maist" of her victuals; now they export both corn and cattle. The land was no larger, but the population was four times as large. What then could be done in this garden-like England. Farming was employing all classes of the people, from the prince on the throne (who is a patron), down to the lowest, and he had no doubt it would greatly progress. It was now on the increase; and it was found to be a beneficial operation and he hoped every succeeding to find it under still greater auspices. He begged to propose the health of the strangers present; coupling with it the name of Mr. McHeaton.

MR. McHEATON said that, as a stranger, he had met with greater courtesy here, than he had ever met with before. By these meetings they were endeavouring to diffuse real benefit amongst the farmers, and to better their condition. Many farmers felt a great difficulty in securing the necessary capital for carrying on their operations. He was happy to find that a society was in the course of formation for doing away with this difficulty. It proposes to

direct its energies to improve the cultivation of the land, by a good system of draining, and the adaptation of crops to the soil; to improve the buildings, and other things connected with farming in general. They propose to raise a capital of one million, and will lend money to the tenant, who will, of course, pay a reasonable interest. Mr. McHeaton concluded by proposing the health of the Committee.

Mr. CHARNOCK rose on behalf of the Committee whose health they had just drank. He could assure them they had great pleasure in doing anything which should conduce to the interest of the club.

Perhaps they would still allow him to "harp upon his daughter," and say a few words of confirmation as to what the former speaker had said. He had not heard till the present moment of the society mentioned by Mr. McHeaton. So far as he was concerned, and the committee of the Yorkshire Drainage Association, they would be most happy to co-operate with such a society, in anything that may be to their mutual advantage. He thought that in agricultural pursuits such collective powers might be mutually and beneficially employed.

The meeting then separated.—Wakefield Journal.

PROBUS FARMERS' CLUB.

The annual meeting of the members of this spirited agricultural society, was held at Probus, on Saturday, January 10. After the transaction of business at the school-room, by the committee, a party of nearly forty members and friends partook of an excellent dinner at the Hawkin's Arms. Mr. Tresawna, the president of the club, presided; Mr. Williams, the secretary, was vice-president.

After the removal of the cloth, the healths of the Queen, Prince Albert, and the rest of the royal family were given.

The CHAIRMAN then gave, "Success to agriculture; and may the skill and industry of the British farmer conduct him through all the difficulties which he may have to encounter" (*cheers*).

The secretary then read the report of the committee for the past year:—

The report commenced by referring to the neglect of the advantages which the club affords, by the younger agriculturists of the neighbourhood. The state of the funds was satisfactory; and the library had increased in value. The subjects introduced at the ordinary meetings of the club, had been more numerous and more freely discussed than those in preceding years. As the funds were not sufficient to warrant the offering premiums for the best samples of roots and seeds, the committee recommended that small sweepstakes be entered into for competition by the members.

Some other toasts followed, among which was the favourite one of "Liberal landlords and industrious tenants;" after which, on the chairman's invitation, Mr. Karkeek, of Truro, proceeded to deliver a

LECTURE ON MANURES.

Mr. KARKEEK laid down as the basis of his lecture, the principle that the food of plants consists of substances like to those of which the plants themselves are composed. This principle was

illustrated by analyses of some of the principal plants cultivated by the farmer. The elementary bodies which were wrought into the substance of plants, and of which manures, to be properly and scientifically applied, should consist, he divided into two classes—organic and inorganic; the latter comprising potass, soda, lime, magnesia, alumina, oxide of iron, oxide of manganese, silica, sulphuric acid, phosphoric acid, and chlorine; the former class comprising oxygen, hydrogen, nitrogen, and carbon. He then explained whence these substances were obtained. The inorganic being derived from the soil, he showed the per centage of each commonly found in the Cornish soils. This part of the lecture was extremely interesting, illustrated as it was, by analyses of the Cornish rocks and soils, and clearly proving that the various soils were valuable in proportion to their per centage of potass, soda, lime, and phosphate. The effect of the application of lime, he said, was sometimes to supply a valuable mineral ingredient when absent, as it frequently was, from many of the slate soils; but it more frequently acted in quite a different manner—by liberating the silica, potass, phosphate, and carbonaceous matter, to be administered to the wants of vegetation. If a chemist wished to liberate potass or silica from the soil he was analyzing, he mixed it with lime, and then heated the whole together, by which means he rendered soluble in acid or in water, all that was insoluble before. "The farmer," said the lecturer, "when he limes his land, performs exactly the same operation as the chemist; he liberates from the soil more of the alkaline and earthy phosphates, &c., in one year, than could be extracted, by any other means, in three or four years." But it generally happened that no equivalent was furnished to the land for that which was removed by the crops; and hence the continuance of the system of liming, was no

better than a rapid method of exhausting the soil. In the absence of the alkalis, the phosphates, and other earthy salts, no plants could grow to perfection; and however valuable nitrogenized and carbonized manures were, they were alone insufficient to become part of a plant destined to the nourishment of animals. When considering the *organic* elements, which were derived, partly from the atmosphere, and partly from the soil in the shape of manure, Mr. Karkeek showed the importance of preserving the various manures made on the farm, which contained the various alkalis, phosphates, and other earthy salts, as well as nitrogenized and carbonized elements. Farm-yard manure, with others of like nature, contained all the elements plants required; and by applying them to the soil in proper quantities, the farmer supplied all that had been taken away by the different crops. Guano also was another manure which contained nearly all the required elements. This part of the lecture was illustrated by analyses of the principal chemical fertilizing ingredients contained in the various manures usually employed by farmers; showing that by a careful preservation of the manure on a farm, the farmer might obtain the raw material of guano at home, instead of importing it from abroad. For this purpose, the lecturer recommended the farmer to collect together road-scrapings, weeds of every kind, old banks and marls, to mix with the liquor of their dung heaps, which would fix the volatilized portion, and prevent its wasteful escape into the atmosphere. All the more valuable parts of a dung heap would either run away, or fly away, unless means of prevention were adopted: and the substances he had named contained salts of various kinds which absorbed and fixed the ammoniacal parts of a dung heap, as well as could be done by the application of gypsum, sulphuric acid, or any other chemical ingredient. This was a very important subject for the farmers' consideration; many of them willingly paid pounds yearly in the purchase of guano, but grudged the expense of a day's work for a man, to preserve the raw material on their own farm-yard, allowing it either to escape into the atmosphere or into the water-courses, spreading disease and death among themselves, their families, and their live stock. Another part of the lecture treated of the conditions for manuring land generally expressed in leases. These the lecturer strongly condemned as injurious to the farmer, the landlord, and the country generally, by tending to perpetuate bad farming. In one lease, a tenant was bound, by way of manuring the land for wheat, to use 100 butt loads of mixens, consisting chiefly of the scrapings of the road, the field, and the farm yard. Another was bound to dress the land with 100 bushels of

lime; another was not allowed to employ lime oftener than once in nine years; and another was obliged to carry so many loads of sea-sand and dung, and road scrapings. These ridiculous clauses should be set aside, founded as they were upon obsolete and unprofitable systems of husbandry, equally inconsistent with modern improvements and with prudent discrimination of the characters of the tenantry. That certain restrictions were necessary, no one could deny; but they should be so framed that while the tenant was prevented from doing injury to the estate, he should not be so fettered as to bar improvement. Mr. Karkeek also alluded to a clause generally inserted in Cornish leases, restricting the farmer from selling his barley and oaten straw. This he considered to be a wise and necessary restriction, for the ashes of straw consisted for the greater part of silicate of potash, and if this article was sold off the farm, it was robbing it of those very essential materials on which the success of corn crops greatly depended. "Nothing," he said, "could justify the selling of straw except the applying to the land, for every ton, the value of the same in some chemical manure containing those ingredients removed from the farm."

Mr. DOWNING said, as Mr. Karkeek had spoken of beans and peas as articles of food most productive of muscle, he should be glad to know if it was necessary to continue the use of such food in order to keep up the muscle once produced?

Mr. KARKEEK replied that the continuance of the use of muscle-forming food was necessary, because there was, in every action of the animal, a constant wear and tear of muscle going on.

Mr. TRETHERY adverted to the introduction of *silica* in the tabular forms exhibited by Mr. Karkeek in illustration of his lecture; and said he believed its use was but little understood by farmers generally. He believed its use was principally to strengthen the stalk, which was a flinty substance. There was a great deal of silica in most of the north country sands; and he believed it was largely used in Daniell's manure. On a great deal of the soil in this neighbourhood they could grow a great deal of straw, but it was very apt to lodge. Possibly, if more *silica* were used, the straw would be strengthened, and they would have a more perfect grain.

Mr. DOBLE: I am told that charlock has been recommended for strengthening the barley-straw (*laughter*).

Mr. KARKEEK said that the soils in the neighbourhood contained *silica* in a considerable degree, and gentlemen need not use charlock for keeping up their barley (*laughter*). Silica alone was required; but then they must have an *alkali* in combination with the silica, otherwise the plants could

not take it up. Either soda or potash formed an excellent chemical combination with silica, particularly for all cereal plants.

Mr. ROBINS, of Roche, referring to an observation that granite soils contained more silica than the slate soils, said that, according to his experience, the crops on granite soils lodged more than those on the *shelf* or slate soils.

Mr. TRETHERY said, as Mr. Karkeek had made some allusion to the soil on the Carnwinnick estate, and the use of bone-dust there, it might not be amiss to state that the use of bones had been found very serviceable there, and that their effect, ten years since their application, was still visible. He would also observe that where they had continued the application of bone-dust, it had also been successful, not only with turnips, but with the following crops of corn and grasses. It was his firm belief that nothing was equal to bone for a light soil. It might also be useful for a heavy soil; but he should prefer it for a light soil lying on *killas*. He believed it also answered on granite. He had seen it used with very great advantage indeed on some very inferior soils in the parish of St. Stephens, that abut on the parish of Probus. He was satisfied that there was never a manure applied to better purpose. It was done by a small farmer, and he was enabled to grow beautiful crops of potatoes and turnips on land scarcely ever before brought into use. Mr. Trethewy, in conclusion, appealed to Mr. Robins, of Roche, saying he had no doubt that that gentleman, who had tried bone, had found it very useful.

Mr. ROBINS replied in the affirmative.

Mr. KARKEEK pointed to an analysis of the soil at Carnwinnick (where he said the land had been let at 2s. 6d. per acre), observed that it appeared to contain all the inorganic elements required for the growth of plants, in addition to some decayed vegetable matter and humus. Now Mr. Trethewy applied to this soil nothing but bone-dust—not fresh bones, but such bones as were commonly used, of which the largest constituent was phosphate of lime.

The CHAIRMAN asked Mr. Trethewy if he had tried lime on Carnwinnick, where he had previously tried bone-dust?

Mr. TRETHERY said, Yes: he had carried 100 bushels of lime last year, in addition to other manures, for turnips. The first turnips looked very stunted and ill; but after a time they made a start, and they were now the best turnips in the field. This land had been previously dressed with bone-dust, and was also dressed with bone-dust, in addition to the lime, for turnips. There was nothing in the shape of mineral manure carried besides the lime. Perhaps it might be well for him to say

that, some twenty years since, some of this land was broken and limed, but it was a total failure. It was then tilled, some to wheat and some to turnips, but the crop was very inferior, and the land was allowed to go to waste again; and he believed it would have so remained to the present moment, had not bone been brought into use. [Mr. KARKEEK: The land wanted phosphates and a small quantity of nitrogen.] They had taken repeated crops successively on the same ground, but not in regular rotation—merely as they suited best. That was done in order to destroy the young furze, which was constantly sprouting. It was well known to most persons who were in the habit of farming rough land in this country that there was great difficulty in destroying the furze; and, indeed, it was thought almost impracticable, because they could not get a second crop, until bone-dust came into use. Now he found no difficulty in producing a crop of turnips from that land—either from fallow, or from wheat or oat stubble; he had grown turnips repeatedly, after wheat or oats, with a single ploughing—the land ploughed down in November, and not touched again till the seed was sown.

In reply to the Chairman, Mr. TRETHERY said the quantity of bone-dust he had used was about 2½ quarters per statute acre, and no other manure but that.

Mr. KARKEEK: But you consumed part of your turnips on the ground with sheep.

Mr. TRETHERY said that he meant to say that they carried nothing in on the farm but bone-dust, and lately some guano. He had made, of late, a pretty deal of yard manure, which had been principally carried for wheat every year; and he had been successful in growing wheat after oats with yard manure. He found this the best method of keeping back the furze. He took two white crops following, and then a crop of turnips. He had succeeded in doing that: he did not mean to say it was a good practice: it was done in order to destroy the furze.

Mr. DOBLE said it appeared that Mr. Trethewy had formerly carried lime on his land without effect; but after the soil had been bone-dusted, the lime produced a good effect.

Mr. KARKEEK said Mr. Trethewy had been not only carrying bone-dust on the farm, but had also been manufacturing manure. All the organic and inorganic elements had been carried on the farm, in yard manure. When the lime was applied, the land had been under cultivation for five or six years.

Mr. DOBLE asked if there was any dung carried on the field.

Mr. TRETHERY said, Yes; of course, the sheep had been eating off the turnip crops.

Mr. KARKEEK thought the plan adopted by Mr. Collins, of Truthan, for bringing waste lands into cultivation, was very good. His plan was to cultivate with bone-dust a crop of turnips, half of which was eaten off by sheep folded on the land. After that, he took a crop of barley or oats, and then let the land to grass for two years. Then he put in a crop of rape, which was also eaten by sheep; then followed wheat, then turnips, barley, and seeds again. That was the plan which Mr. Collins had pursued on those barren lands which many respectable farmers considered as worth nothing at all, but which Mr. Karkeek believed he had converted into a valuable property.

A gentleman, referring, we believe, to the Carnwinnick experiment, said they must not consider that all the merit was due to the bone-dust alone, but to its having come into contact subsequently with lime.

Mr. KARKEEK said he believed the operation was thus:—The bone-dust produced large crops, which led to the production of a large quantity of manure, and, by this means, there was a larger proportion of humus in the soil, when the lime was applied the second time.

Mr. P. DAVIS: But supposing no dung was applied?

Mr. KARKEEK said, again, if the land contained the mineral elements to which he had before alluded, the lime would bring them into active operation. If he were a farmer, and looking out for a farm in the neighbourhood, he would try to select one that had not been limed for a good many years. He would then immediately begin to use lime, particularly if he had but a seven-years lease; but, of course, he should impoverish the soil by so doing.

Mr. DAVIS: But, as you would be making other manure on the land, you would not impoverish the soil.

Mr. KARKEEK: There could be no doubt it would impoverish the soil to a great extent, because the farmer did not carry everything back on the land which he took from it; he sold all the wheat straw he could, and all the hay which he did not consume on the farm, besides the cattle and sheep fed and sold. After repeated applications of lime, what was required was a quantity of night soil and farm-yard dung or guano, which contained the elements that had been removed by the application of lime.

In reply to the chairman, Mr. TRETHERY said with bone-dust or guano, he would rather take the chance of a crop of turnips on waste land just broken up, than on the best land they had.

The CHAIRMAN: Can you get as good crops from waste land just broken up as you can from land that has been kept in cultivation for several years?

Mr. TRETHERY replied that he saw but very little difference. They might expect the best crop from land just broken up, because generally it was burnt, and the effect of the ashes was to be considered besides that of the bones. But still he would as soon take the chance of a crop of turnips from wheat or oat stubble, as he would from land just broken up at Carnwinnick.

Mr. KARKEEK should think the best crop would be from the land just broken up. He did not call Carnwinnick a bad soil. But the best land for farming was near Penzance, on the greenstone rock. Considering its mineral elements, and the climate in which it was situate, he believed it was both theoretically and practically the best land in England. It was the only land in England that could produce two crops of potatoes in the year. 1,000 acres of the land round Penzance produced a rental of nearly 10,000*l*.

Mr. TRETHERY said Mr. Karkeek had alluded in his lecture to the necessity of improving the farmyards in Cornwall. He perfectly agreed with Mr. Karkeek on that subject; he believed there were few counties in England in which this subject was less attended to. There had, however, been great improvement of late years, and also in the preservation of liquid manures. He was not of opinion that the best way of preserving liquid manures was in tanks. He believed it might be better applied to mould, or broken killas, as a means of preserving it. He would not recommend *couch* for the preservation of liquid manure, but either mould or peat soil. He thought it might be thus turned to better account than where applied in its liquid form; besides which, the mode he suggested would save a great deal of labour. He had observed on Lord Ducie's farm that there were large tanks for the reception of the liquid manure, which was conveyed thence to the *mixens*, or piles of mould, with which it was mixed. That was, in his opinion, the best mode of applying it.

Mr. KARKEEK explained that he had not, in his lecture, recommended the growing of *couch* grass for the purpose of mixing with liquid manure (*laughter*). He had merely said that if the farmer would mix the liquid manure with his road-scrapings, &c.—*couch* grass if he had any; the salts which they contained would be very useful in fixing the ammonia and other volatile substances in the liquid.

Mr. MILFORD proposed "Success to the Probus Farmers' Club, and the health of Mr. Wm. James."

Mr. W. JAMES returned thanks; spoke of the gratification he felt at being one of the oldest members of the club—acknowledged that he had received very much instruction from attending its meetings—and expressed his regret that, as the re-

port of the committee had stated, the club should be neglected by the young men of the neighbourhood (*hear*). Mr. James proposed the health of the chairman, to whose ability and courtesy the club was highly indebted. (The toast was cordially received, and drunk with three times three.)

The CHAIRMAN expressed his sense of incompetency for the performance of the duties of his office; but as they had again that day appointed him to the office of President of their Club, they might rely on every effort in his power to promote its prosperity. They had now met to celebrate their seventh anniversary; and he hoped that some among them, at least, had received great benefit from having been members of the club. He thought it would be well if they were all to review their conduct, as farmers, since they had been members of the club, to see if they had improved the opportunities afforded them. If they had not so done, it should be the means of stimulating them to more active exertions in future (*hear*). Their facilities of gaining information on agricultural subjects were great; at their monthly meetings, the various opinions of the members were brought forward, and in their library they had the best works written on agricultural subjects, which they might carry home, and read at their fire-sides. If they acted up to the instructions derived from these sources, he was sure they could not fail to make great improvement in the different branches of agriculture. And they must remember that it was not enough for the farmer to have a knowledge of one or two of those branches, and be deficient in the rest. It was not enough to know how to cultivate and manure their land so as to raise a good crop; but they ought also to know how to make the most of the crop afterwards; otherwise, it was impossible for them to farm with advantage. It was of vital importance to become acquainted with all the branches of agricultural information; and, certainly, one of the best means of so doing was to attend the monthly meetings of our Farmers' Clubs (*applause*).

The CHAIRMAN then said he was about to propose a toast which he was sure they would all drink with great pleasure. It was the health of one of their most useful members, Mr. Karkeek (*cheers*). It was an honour to the club to have that gentleman as a member; and he would beg to propose his health, with thanks to him for his excellent lecture (*cheers*).

Mr. KARKEEK returned thanks, and expressed his unabated interest in the prosperity of the Club. If he had been enabled to render it any small service, he had been more than amply repaid by the information he had received in return. Mr. Karkeek proposed the health of one of the oldest, and

most useful members of the club, and one of the most regular in attendance—Mr. Richard Doble; one who had always acted on the 'go-ahead' system, and, as he believed, meant still to maintain it.

Mr. R. DOBLE, after acknowledging the compliment paid him, said he was always willing to assist the operations of the club, either by trying experiments or otherwise. He thought those clubs were very useful; and if they went to any club, they might learn something. He was not quite so prejudiced as Mr. Liddell, who thought there was nothing to be learned in Probus (*No no; a parish in the west*). Probus, he presumed, was the parish alluded to; at all events, it was a very celebrated parish in the west. Mr. Liddell said he should not come into the west again to learn anything about farming. He agreed with Mr. Liddell that there was some coarse ground in Probus (*no; a parish in the west*), and many other places; but that was not the fault of the farmers, and had nothing to do with farming. As to the growing charlock as a prop for barley, that he (Mr. Doble) did not understand. They had been sadly in the dark here if that was the proper mode of growing barley. For 20 or 30 years they had been trying to eradicate every weed they could find. But it appeared there was a new light [*Yes; a northern light*] (*laughter*). It might be a correct one; but, for his part, he should not try the experiment. He had seen some beautiful fields of charlock in the north, in the beginning of the summer; and could hardly tell whether the crop was barley or charlock. It looked very beautiful to the eye; but still he thought it was a very unprofitable experiment.

Mr. DOWNING proposed the health of Mr. Peter Davis, as the founder of the club, and expressed his gratification at learning that the funds of the club were in a favourable state.

Mr. PETER DAVIS returned thanks, and spoke in disapproval of so large a use of sand and lime as was customary in that neighbourhood—especially, the sand generally used. He had carried sand from Tresillian and the north, and lime, as much as any person in Probus; but he had now altered his system altogether. Speaking of the recent progress of farmers in the race of improvement, Mr. Davis said he had no doubt they would, by and by, be able to cope with the manufacturers. Had Farmers' Clubs been established fifty years ago, he had no doubt that, at the present time, they would have nothing to fear from the corn laws or anything else.

The CHAIRMAN proposed the health of 'the strangers' naming his old and valued friend, Mr. Hotton.

Mr. HOTTON, formerly of Probus, but for some years resident in London, acknowledged the toast,

in a long and able speech, congratulating the Club on what it had already accomplished in the pursuit of useful scientific knowledge; and urging the members to future perseverance. He was surprised to learn that there existed among the younger farmers, so much apathy towards this club. He trusted they would with one voice, and one heart unite in the promotion of its objects. He felt pride in being a native of Probus; and was lately highly gratified in hearing a gentleman of Gloucester, who, in the summer, took a tour down to Penzance, say, that of all the farming he saw from the time he left Gloucester till he reached Penzance, he gave the preference to Probus (*cheers*).

Mr. HEARD proposed the health of Mr. Trethewy—a gentleman who was always willing to give every information he possible could to his brother agriculturist (*cheers*).

Mr. TRETHERY returned thanks. It afforded him great pleasure to be useful in any way to this or any other Society of Farmers. Although farming was, as Mr. Hotton had said, a very pleasant life, he was sorry to say it was not a very profitable one. He would not recommend gentlemen who were not farmers to leave their profession, and take to farming (*hear and laughter*), though he must acknowledge it was a very pleasant and independent life for a man who had a good estate with capital. They might see the day when farming would flourish again. He hoped that day was not far distant. Whatever might be the clouds, the sun might still appear. What the "northern light" might do, he did not know (*laughter*). It might improve the weight of grain, but he did not think it would improve the loaf.

Mr. TRETHERY proposed, "The Press," and expressed his high sense of the obligations which agriculturists were under, to so efficient a medium for the communication of their proceedings. He also alluded to the regularity with which the proceedings of the Probus Club had been reported in the *Cornwall Gazette* and *West Briton* papers.

The toast was most heartily received, and was acknowledged by the reporters for those papers.

The importance to the farmer, of correct book-keeping, having been adverted to, Mr. TRETHERY said the subject had been discussed at one of the ordinary meetings of this club, and a set of books as approved by the club might be had of the secretary. He perfectly agreed that a correct method of keeping farming accounts was essential to the prosperity of the farmer.

The CHAIRMAN proposed the health of the secretary, to whom the club was greatly indebted; but who, he was sorry to say, had that day resigned his office, in consequence of his business at Truro requiring his personal attendance, on those days

(Saturdays) on which the club had its monthly meetings at Probus.

The toast was drunk with cheers.

Mr. WILLIAMS returned thanks, alleging that the reason for his retirement was as had been stated by the chairman. He still desired to remain a member of the club (*cheers*), and should feel continued interest in its welfare. Mr. Williams spoke in high terms of the young gentleman (Mr. Henry Tresawna) who had been appointed to succeed him in the office of secretary. He then adverted to a subject mentioned in the report—the getting up of a sweepstakes for the best farming, towards which, we understood Mr. Williams to say he had some contributions.—With reference to the subject of book-keeping, he thought it was very desirable that those members who had used the books sanctioned by the club, should give their opinions on them, and suggest any improvements that might render them more useful.

Several complimentary toasts were now given: after which, the CHAIRMAN said as there were present some gentlemen who were not members it might not be amiss to state that the club were now trying some experiments. It must be well known that a club like theirs, could do much more in the way of trying experiments than could individuals. A single individual might incur serious loss; but if they, as a club, incurred loss, it would be of less consequence. It had been considered by the club that they could not spend their money better than in trying experiments; and they had, therefore, requested Mr. Doble to conduct one with regard to the feeding of sheep. Mr. Doble had five sheep feeding in a dark house; five others in an open house; and five others in a field. The sheep were all weighed before they were put under the experiment; and the food given them was all weighed.—The club was also going to make some experiments as regards sulphuric acid with bonedust against other manures.

Mr. R. DOBLE said, as far as the experiment on sheep-feeding had gone, he had found that the sheep in the dark house ate more turnips and hay than those in the open house or the field, which was opposed to the result of the experiments on Whitfield Farm, by Messrs. Playfair and Morton. In the field, the sheep had had no hay; they had only grass and turnips. He did not know anything about the present weight of the sheep; he intended to weigh them next Saturday. It might prove that the sheep in the dark house, were paying best, through eating most food.—He then proposed the health of the newly-elected secretary, Mr. Henry Tresawna, which was drunk with cheers.

Some other complimentary toasts followed.—*Cornwall Royal Gazette.*

HIGHLAND AND AGRICULTURAL SOCIETY.

Mr. WILLIAMSON, of Cardrona, was requested to occupy the chair of the monthly meeting, and which meeting was more numerously attended than usual.

The first paper was read by Mr. Boyle, younger, of Shewalton, "On planting within the influence of the sea, or on exposed barren tracts." This subject was well illustrated by the report of Mr. Grigor, of Norwich, on the Trimmingham and Runton plantations, in the county of Norfolk, belonging to Sir Edward North Buxton, Bart., which were executed by the late Sir Thomas Fowell Buxton, and are situated in the northern extremity of that county, close to the German Ocean, standing on elevated sites, opposite to or facing that dangerous part of the coast known as a continuation of the Yarmouth Roads—a tract alike dreadful to the mariner and the merchantman. Notwithstanding the obvious difficulties attending the planting of trees in a situation subject to so continual and severe sea breezes, means were judiciously employed by which the experiment was conducted to a successful issue.

The geological features of the tract occupied by these plantations are well defined, the high cliffs in the immediate neighbourhood showing at once the nature of the underlying strata. The lowest stratum which has been reached is the carr-stone or iron sand-stone, corresponding with the green sand of other places, and is used extensively as a building material. Over this are layers of chalk, namely, red chalk; marl, nearly of a grey colour; hard chalk so compact as to be used in building houses, and containing the remains of a large Saurian animal; and loose chalks, containing flints, arranged in horizontal layers about four feet apart. Reposing on this chalk is a thin layer of ferruginous gravel, containing the wrecks of a forest, such as trunks and branches of trees, and the bones of animals, over which is a marine formation, called crag, containing a thick bed of testaceous remains and littoral shells found on the coast at the present day. Superincumbent on the crag is a stratum of blue clay containing ammonites and gryphæ, the loose texture of which renders it insecure against the effects of the ocean and of land springs. Over the clay is a thick bed of gravel of the poorest description, consisting chiefly of small water-worn pebbles cemented together by a cement of iron, which is hardest, or forms a crust or pan, near the surface.

Of the twenty-two plantations described by the re-

porter, Mr. Boyle selected to read to the meeting three which seemed to combine the particular characteristics of the rest. These are the Boreas, the Rome, and the Davie Hill plantations. The Boreas plantation is represented as the boldest trial which has been made in that part of the country. It runs along the brink of the cliff 250 feet above the sea, and rises 100 feet higher to the top of a hill; and is fully exposed to the keen and biting air which comes from the north-west. The soil consists of sand and peat, superincumbent on a mass of clay, a hundred feet in thickness. It was planted in 1842, and the trees particularly recommended for this locality were the *Pinus pinaster*, *P. maritima*, *P. Austriaca*, *P. Mugho*, the willow, alder, ash, and sycamore. The alder, willow, and sycamore were planted next the sea, intermixed with the *Pinus pinaster*. The pines are already six feet high, and exhibit shoots fifteen inches in length, and seem fitted for bleak and barren tracts even better than the Scotch pine. The ash presents a healthy state, notwithstanding that their tops are continually being acted on by the sea breeze. An ash tree, half a mile from the cliff measures nine feet in circumference, at two feet from the ground.

The Rome plantation contains five acres, and is similarly situated to the foregoing. In it the alder again takes the lead, and it is worthy of especial remark that it thrives well on poor sand and peat soil, in the most exposed situations; whereas it is constantly placed in works on aboriculture within the limits of swamps and bogs. An improvement is yearly observable in the fields adjoining, from the warmth and shelter already afforded by this plantation.

The Davie Hill plantation is 390 feet above the sea, and lies nearly half a mile distant from it. Its extent is eight acres, and its soil is various, much of it being pure sand; and it was planted in March, 1841. The farmers in the neighbourhood are beginning already to appreciate the advantages their lands and stock derive from the yearly increase of shelter afforded by this and the contiguous plantations.

In regard to the preliminary details which were requisite for the formation of these plantations, the first in importance was the formation of the soil. The efforts of unassisted nature would tempt a man but little to plant in such a locality as the vicinity of the sea. Art must, therefore, be exercised

with much ingenuity to foster trees there; so that all maritime planting, to be done effectually, must be an expensive process, and the chief item of expense is trenching the ground. By way of experiment, several acres of the Davie Hill plantation were left untrenched; and the result was, that about two-thirds of the plants died. Indeed, without trenching in such a situation, the land had better remain as it is, for until the plant can readily establish itself underneath, it cannot stand the buffeting of tempestuous winds from the ocean. The time of planting should be in spring, just before the plants begin to show symptoms of vitality, such as in the last week of March and the first week of April; because the plants then have the benefit of a full season's growth before they are subjected to the effects of winter. The next best time is October, and planting has been tried in winter, but with no success. In the choice of plants, experience has proved that two or three year old plants are better than any other, and such as had been transplanted in the nursery the previous year are better than those which had remained undisturbed. An experiment was made in the Davie Hill plantation, by inserting plants four or five feet high, and they fail to establish themselves. But however well the ground may be prepared, or the plants chosen, unless shelter is afforded to young plants, they will perish at the very outset. The best external defence betwixt a young plantation and the sea is furze bundles, or brushwood cut in summer, with the leaves on, and failing these, a turf wall six feet high, broad at the base, and tapering to the top. The best sheltering nurses amongst deciduous trees are the willow, alder, ozier, and birch, and amongst evergreens the Scottish pine. Oaks and the finer kinds of pine should be surrounded with these nurses in the form of a triangle, having its apex towards the sea. The hoeing of the trenched land for the purpose of cleaning it, for at least two years, is all-important.

As to the trees best suited for such a situation, it was the wish of the late Sir Fowell Buxton that most of the trees should give place to the oak; but even of those which were used as nurses, many became trees of great size and utility. Of these, beyond all others, the common black willow, or goat willow (*Salix caprea*), is entitled to take the lead as the best adapted to grow in exposed maritime tracts. The plant is usually regarded as an underwood, but it grows to a large size when not cut down. One specimen, about three quarters of a mile from the sea, is $9\frac{1}{2}$ feet in circumference at four feet from the ground. The alder, birch, and ozier, should be planted, not as mere nurses, but as permanent occupants of the soil. The ash, sycamore, and elm (*Ulmus montana*), maintain them-

selves against the blast in trenched ground, as is well exemplified in the Boreas plantation. No doubt can exist of the perfect adaptation of the pinaster to the bleakest tracts of the country and the poorest description of soil; for a few miles off on the Westwick estate, a space of five hundred acres is covered by them, and traversed by a carriage road of five miles in length.

These pinasters average 12 feet in circumference and 70 feet in height. It is generally understood the Scotch pine is of all the trees the least scrupulous as to the quality of the soil they are placed in; but the pinaster is even more serviceable in sheltering bleak and barren districts. As to underwood, the snowberry (*Symphoricarpos racemosus*) and the barberry (*Berberis aquifolium*) are best suited for planting close to walks, which should be introduced in all maritime plantations for the sake of the view over the ocean.

The expense of planting the 114 acres were 68*l.* for trenching, at 6*l.* per acre; carting stones, 15*l.* 10*s.*; erecting fences and gates, 158*l.*; price of 600,000 acres, at 10*s.* per 1,000, 800*l.*; price of underwood, 80,000 plants, at 15*s.* per thousand, 60*l.*; and expense of cleaning the ground for two years, 102*l.* 12*s.*; altogether, 1,320*l.* 2*s.*, or 11*l.* 11*s.* per acre.

The next subject was an address by Mr. John Goodsir, on the potato disease. He said, on addressing the society, he wished it to be understood that it was not his intention to submit to the meeting any new facts regarding the diseased structure itself, but rather to adduce certain considerations derived from facts already ascertained, and from collateral subjects, which appeared to him to explain the phenomena of the blight, and to reconcile the conflicting opinions regarding it.

He observed, in the first place, that it must be admitted by all that the blight was an epidemic, and therefore there was to be considered in regard to it, first, the general cause of the epidemic—the epidemic influence; and, secondly, the local or individual circumstances or causes of attack in the plants themselves. Regarding the nature of the general or epidemic influence in the potato murrain, nothing very definite can yet be stated; we know nothing, indeed, of the general influences affecting the epidemics in man and the domestic animals except the existence of such epidemic influences, and to a certain extent the laws of their approach, progress, and retrocession.

The local or individual causes of attack in the plants themselves here, as in the other epidemics, promise to yield more easily to inquiry, and to afford more legitimate indications for prevention.

In various epidemics Mr. Goodsir stated that these two causes have different degrees of influence,

and it was interesting to know that in proportion to the knowledge of the nature of the secondary or local causes, was the power we possessed of arresting the progress of an epidemic; the plague, for instance, the secondary causes of which, filthy habits, &c., were well known, is arrested in direct proportion to the improvement in the habits of the people; for the plague is an epidemic disease, in which the general epidemic influence is not so powerful as the secondary cause. In cholera, again, the epidemic influence is stronger than the secondary causes, so that its progress cannot be arrested in the same degree. The general influence appears to be more powerful in the potato murrain than any secondary cause, the plants affected do not appear to be inferior to those of former seasons in quality, at least they certainly contain as much starch and as compact a texture as they usually do.

If such be the general nature of the influences bearing on the disease, a remedy or mode of arrest was not to be hoped for to the extent some one might expect. Here, as in most diseases in man and the domestic animals, our knowledge of the nature of the disease much exceeded our means of cure or prevention.

After alluding to the opinion which appeared to be gaining ground, that contagious and epidemic diseases depend not on an elevated condition of the infected individuals *per se*, but on an influence exerted on them by parasitic or organic beings, developed in or on them—an opinion supported not only by the detection of such parasites in certain diseases, but also by the general phenomena of progress, attack, and arrest. Mr. Goodsir stated that he had always, as others had done, detected in the diseased potato at least two kinds of parasitic fungi—one a minute granular, spherical, deep, brown body, which existed in enormous numbers from the very first access of the disease, the other a branching filiform tubular fungus, with terminal spordia, containing spores, and appearing in the potato rather later apparently than the brown spherical parasite. They both exist in the cavities of the polygonal cells of the tuber, the brown fungus adhering to the walls of the cells, and the outside of the coats of the starch cells, binding them together: the filiform parasite branching among and between the starch cells, so as to be obscured by them.

As these fungi are universally present in the diseased potato, we cannot, in considering the nature and cause of the disease, keep their existence out of view. There can no longer be any doubt that the chemical influence produced by the contents of the cells of certain parts of plants produce certain chemical actions in the juices of these plants, and also

that a similar influence was in all probability exerted on certain fluids in which minute fungi exist, such as the yeast plant in yeast, &c.; it is, therefore, a legitimate hypothesis that constant fungi in the diseased potato must direct or influence the chemical actions and effects which have been detected in the diseased tubers.

This view of the subject in no way tends to overthrow the chemical explanations of the potato blight, but confirms the chemico-vital view of the subject, by combining the opinions of those who apparently differ concerning the disease. In this, as in other inquiries of the same kind, the subject has been retarded by the determined opposition of those who examine it from opposite sides, who are both so far correct, but will not admit the conclusions of their opponents.

From these and from other considerations submitted to the meeting, Mr. Goodsir gave it as the result of the inquiries he had made on the subject, that a general epidemic influence, of the existence of which there can be no doubt, but of the nature of which we know nothing, had during the present season, induced in the potato a disease, the essential nature of which consisted in the growth of two or more species of fungi in the textures of the plant—the plants attacked being in the condition to afford a nidus for the parasites, which condition, however, may not be peculiar to those of the present season—the existence of the fungi being necessary to the constitution of the blight, inasmuch as they afford the initiative, and direct the peculiar changes which take place in the tuber; and in reference to a remedy or mode of arrest of the disease, it was stated, that as the amount and appearance of the starch granules do not to the eye differ from those in the healthy potato, at least until the root is very much diseased—and as other individual and local circumstances in the culture and growth appear to have been very much as in former seasons it is therefore to the general epidemic influence, of whatever nature it may be, that the spread of the disease is to be referred—that a cure or mode of arrest is not to be too certainly looked for—it is to be expected at the same time, that like the influenza and cholera which have already swept across the globe, the potato blight may not again, at least immediately, commit its ravages.

Mr. Goodsir's address was listened to with marked attention, and, at its conclusion, was warmly applauded.

Professor Balfour had listened with much interest to the observations of Mr. Goodsir, and had no doubt of the accuracy of the conclusion he had arrived at, as to the existence of fungi in the potato in certain stages of the disease. The researches of Mr. Berkeley led to the conclusion that several

species of fungi, especially *Botrytis infestans*, gave rise to the phenomena of the disease. The *Botrytis* attacked all parts of the potato, including leaves, stems, and tubers. These fungi are never developed in dead matter, but always appear on living bodies. One of them, *B. bassiana*, causes the disease in silk worms called Muscardine. From these and other phenomena of a similar nature, it seemed to be evident that under certain circumstances, which are still very obscure, animals and plants are liable to the attack of fungi, which modify if they do not cause disease.

Mr. Goodsir, in further illustration of the subject, adverted to the existence of vegetable fungus in the minnow, gold-fish, frogs, and newts; and as the employment of moss water, as a means of checking the disease, had been recommended by the Commissioners in Ireland, it may have the effect of killing the fungi in the potato tuber, in the same manner as creosote is known to destroy vegetable fungus in the human stomach.

Mr. Lawson then read the substance of a communication from Sir James Miles Riddell of Stron-tirn, and another from his overseer, Mr. Thomas Smith, on a collection of potatoes presented to the Society's Museum, which had been raised from seed collected in October, 1842. The apples were laid in boxes in alternate layers, with dry sharp sand. In the succeeding May they were well rubbed by the hand with the sand, and sown in prepared ground. In the middle of July they showed a good braird; and shortly after some of the plants were transplanted, which succeeded better than those left in the bed, the plants being more vigorous and the tubers larger. In spring, 1844, they were planted whole, and the collection now exhibited on the table was the produce. The transplanting in July seems a good practice. Sir James states that the produce was quite healthy on the 3rd December, when he wrote, and that previous to that period only a very few had been dis-

covered that showed any symptoms of disease, which was the case throughout generally in his neighbourhood. Sir James's opinion is, that the primary cause of the disease is the extreme humidity of the summer and autumn; and this opinion is, to some extent, corroborated by a communication which Mr. Lawson had received from an extensive proprietor in Holland, Mr. M. E. Haveelaar, of Rotterdam, of date the 28th November, who says, that everywhere in strong moist soils, the crop had failed, while in high dry soils it had produced an average crop; that the potatoes taken up during the rain became diseased, while those which were lifted dry did not become so. Throughout Holland, generally, in marshy soils, he adds, the disease showed itself in July, in Guelderland in August. Sir James Riddell draws these conclusions—1. That there is no deterioration of the plant; 2. That he has no reason to suppose that a fungus is the primary cause; 3. That the variable temperature and excessive moisture of the season were sufficient to produce it; 4. And that the separation of the diseased potatoes, and drying the good ones, are the only processes necessary to preserve them.

Mr. Gordon, of Cairnbulg, took the opportunity of observing, that in the district of Buchan, in Aberdeenshire, with which he is connected, and in which potatoes are extensively grown, he had not heard of the disease appearing, but on the contrary that the late crop in that quarter had been both abundant, and of an excellent quality.

Mr. Stephens then exhibited a small model of a ventilating pit for keeping potatoes, sent to the Society by Dr. Halpin, of Cavan, in Ireland, from whom he read a letter, of date the 29th November, containing a statement of the approbation conferred on this his mode of keeping potatoes by the Lord Lieutenant, the press, and other parties in Ireland.

The paper on the wheat fly, by Mr. Archibald Gorrie, was postponed to the next meeting.

BURTON-ON-TRENT FARMERS' CLUB.

At the evening meeting, held on Thursday, the 11th January, Mr. Worthington was called to the chair; and Mr. J. D. Greaves, the Secretary of the Club, read the following paper on the subject which had been appointed for discussion:—

The question proposed for our consideration this evening is—"What kind of green crop may be most advantageously interposed between the previous corn and the turnip crop?"

I do not know that I can answer the question satisfactorily, because my experience in growing different kinds of plants in this part of the rotation has been very limited. As far as it goes, however, my experience is in favour of growing that kind of crop which seems generally to be most approved; and I will shortly state the reasons which appear to me to make it the most eligible; I will afterwards proceed to say a few words on the question, whether

it is a beneficial practice to grow any green crop at all before the Swedish turnip, instead of letting the land be fallow till the spring. Among the many plants which have at various times been cultivated for early spring feed, the only one which seems to me to require notice are, the crimson clover, white mustard, tares, rape and cole-seed, Italian rye-grass, and rye. The crimson clover I have myself tried; and though at first it was much praised, and excited great hopes of its becoming a most useful crop, it is now gone quite out of fashion in our part of the country, having been found too tender for the winter. The other plants, except white mustard, I have grown, but not so frequently as to give me confidence in speaking decidedly as to their merits. The Italian rye-grass gives a good bulk of feed very early in the spring; but there are two objections against cultivating it between two crops: first, it is necessary to sow it with the corn crop, and you are thereby prevented from giving the land an autumn tillage, which I consider to be of the utmost importance in keeping it clean; and secondly, the roots of the rye-grass would prevent your getting the land into so fine a state of tilth in the spring as turnips require. Of white mustard I know nothing, except from what I read in the journals. It seems to be likely to prove a useful plant for summer and autumn feed; but I should doubt if it will be found to stand the winter, and produce a full bite early in the spring. Besides, there is perhaps an objection to this plant, which equally applies to rape and cole-seed: they are so close akin in nature to the turnip, that it might not be advisable to grow them before that crop. I have tried rape, however; but I cannot say that I had reason to think the succeeding turnip crop was at all hurt by it. I was at first very much inclined to prefer rape to any other crop, because the seed is so inexpensive; but I did not get much eating from it in the spring, and have abandoned it for rye—which, though the seed comes high, gives in general so much more feed, that I think the extra expense has repaid me.

Winter tares are grown in the south of England before the Swede turnip; but the difference of the climate both renders the tares earlier, and requires the Swede to be sown later, than in this part of the kingdom. I have seldom found winter tares ready to eat off until the middle of May, by which time the Swede turnip ought to be sown, if the weather be favourable. As a crop before the white turnip, nothing that I know of is at all comparable to winter tares and rye; and whatever may be thought of the practice of growing a green crop before the Swedes, there is not a doubt that a crop of tares may always be taken with advantage before the white turnip. I had, in this season, winter tares and rye, which, when I mowed them, would have weighed

20 tons per acre, and were thought worthy of the prize of our agricultural society; and my white turnip, grown after them, certainly exceed 40 tons per acre, including tops. Nothing, however, that I have seen—except rye—will give any bulk of eating before the first week in May, by which time it is essential for the land intended for Swedes to be cleared; the only objection to it is the expense of seed. My plan is to plough up the stubble as soon as possible after harvest, give it a good cleaning, and sow $2\frac{1}{2}$ bushels an acre of rye, broadcast. I do not think it can be put in too early; indeed, I should say that the great advantage of growing it at all is only seen in those years in which the corn harvest is tolerably early. There is no danger of its being too winter proud: the higher it is before winter, the better it stands the cold and the earlier it gets a head in the spring. I usually eat it with ewes and lambs, beginning the last week in March or the first in April, from which time until May it will in ordinary years keep well ten to twenty sheep to the acre. I have seen in a prize essay, published in the "Royal Agricultural Society's Journal," that a mixture of rye and rape is recommended, which I should think might perhaps answer better than rye alone, and I have some thoughts of trying it another season. I observe too, in the last number of the same journal, that Mr. Baker, of Writtle, describes a kind of rye which appears to be much earlier, and to yield a very much larger bulk of produce than what I have grown; and in looking over the English translation of "Von Thaeer," I find that the colts bears the winter better than the rape, and grows more luxuriantly in the spring. One may hope, therefore, that as the practice of growing an intermediate green crop extends, we may arrive at a more advantageous way of management than we now follow.

I might stop here, for I have nothing more to say as to the immediate question which is given as the subject of discussion; but as the practice of growing an intermediate crop is not generally introduced among us, it is perhaps more important that we should consider the expediency of adopting the practice, than that we should decide what crop is best to sow. I will, therefore, offer a few remarks on that point. I must confess that it does not, on a first view of the matter, seem very profitable to grow a crop which returns but a little more than the cost of the seed; yet, perhaps, when the advantages are all stated, they will appear sufficient to warrant the practice. It must be borne in mind, that whether we sow a crop in the autumn, or no, the land should be well cleaned, so that no part of the expense of the tillage should be set down against the spring crop, except merely the sowing and harrowing of the seed.

In ordinary years, the price of rye may be taken at 5s. a bushel; the expense will be, therefore, per acre, $2\frac{1}{2}$ bushels rye at 5s., sowing and harrowing 1s. 6d.,—cost 14s.; against which we have to set down the value of the keep of ten sheep five weeks. I suppose nobody will doubt that this is worth 6d. a week for each sheep; it is generally worth nearer double that sum in early spring; but I both take the lowest amount of produce and calculate its value at the lowest rate, lest I should appear to be anxious to show the fairest side of the practice I am recommending. The value per acre is, therefore, at least 25s.; leaving 11s. per acre of profit. Where the rye has been put in early, or the autumn has been open and warm, or the spring forward, the produce will be twice or thrice this amount. Besides this, the land is benefited by the consumption of the rye on it: and I reckon this benefit to be at least equal to one ton of good manure per acre. So that, on the whole, the profit on the crop is not far short of £1 per acre, even on the lowest calculation; and that, you will agree with me, is no insignificant farming profit on the use of the land for the dead half of the year. Notwithstanding this apparent direct profit, I am inclined to think that the indirect advantage is greater; and as it is this which, to my mind, forms the chief argument for the practice, I think it worth while to insist on it the most. This indirect advantage is, in enabling you to reserve your pastures, seeds, and tares, until they have got a good start.

I do not think there is anything so ruinous as cropping grass and seeds bare in the spring; and if we examine the matter closely, we shall, I think, at once see why so much injury is done. Every farmer acknowledges the fact, that all kinds of herbage grow much more profusely when they have once got a good cover. This is sometimes attributed to the ground being kept warm, and at other times to its being kept moist in dry weather. It is, I believe, true, that in early spring the growth of herbage is very greatly promoted by the ground being covered; and of late it has been recommended to cover grass in spring with thorns, or straw, to get early spring feed. The covering prevents the escape of heat from the surface of the earth, and thereby promotes vegetation. We see just the same effect produced when pastures are left with a good bite before the winter; and this seems to me the cheapest and most efficient system of Gurneying. It is also certain that a good cover of herbage will protect the plants from the effects of drought. But neither of these two causes seems to me sufficient to account for the immense increase of produce which land throws up when the herbage is suffered to get full and high, instead of being kept bare by the stock. The true explana-

tion of the fact I take to be, that a plant, when it has attained a larger size, grows more in a given time than while it is smaller. Suppose that a pasture of fair average quality and condition be left without stock in the spring, it will yield 30 cwt. of hay per acre by the middle of June. Now, 30 cwt. of dry hay is equal to at least 15 weeks' keep of a cow. But if you should turn cattle in this same piece of land on the 1st of May, when there is just a spare bite of herbage, an acre of it will not more than supply one cow for the six weeks until the middle of June, at which time the land will be as bare as mown ground. In one case, therefore, the land will have returned 15 weeks' keep for a cow; in the other, only six. It is calculated that land divided into small enclosures, so as to allow a frequent change of pasture, will keep twice as much stock as when the cattle are suffered to roam the whole summer upon one field. I do not know how to account for this fact, but by explaining it on the principle I have named. In each of the enclosures, the grass is allowed to attain, perhaps, twice the height before it is eaten, which it would have attained in the single field. It is asserted by some advocates of summer soiling, that the same quantity of land will keep three times as much stock when its produce is mown, and consumed in sheds, as when it is pastured. The difference may not be quite so great as the zealous advocates of the soiling system make out, but it is certainly, I think, greater than is to be accounted for by the usual mode of explaining the fact. The cattle trample down so much herbage, it is said, and spoil so much by their excrements, that less than half of it is consumed by the grazing cattle. I cannot see how this is made out, since, in the end, a pasture will, if sufficiently stocked, be eaten bare, and every blade of grass which the land has yielded will have been eaten up, except just where the excrements have fallen; so that not a tenth of the surface can have been wasted. There is in Von Thaer's work a passage which shows that he was aware of the real cause of the superiority of soiling. He quotes an experiment made on clover:—A part was cut three times, at intervals of a fortnight; and on a given space, each mowing produced 30 lbs. Another part was left for six weeks; and the produce of the same space as had at three mowings yielded 90 lbs., was 600 lbs. The author of the "Book of the Farm" quotes, from a prize essay of the Highland Society, a notice of the singular fact, that sheep, on turnips, will consume nearly, in proportion to cattle, weight for weight; that is, 10 sheep, of 14 lbs. a quarter, or 40 stones in all, will consume nearly the same quantity of turnips as an ox of 40 stones; but that if the ox be turned to grass, six of the sheep will consume an equal quantity.

"This great difference," the author of the essay says, "may perhaps be accounted for by the practice of sheep cropping the grass much closer and oftener than cattle, and which, of course, prevents its growing so rapidly as with cattle." A horse will not, certainly, eat so much in the stable as a milking cow in the shed; but it is an established custom to charge more for the grazing of a horse than of a cow; and this custom has arisen, not because the horse consumed more grass, but because, from his manner of grazing, he prevented the growth of the grass more than the cow, which does not graze so close. I had a piece of grass this season, which was kept very full of keep the whole summer; and I am sure that it kept me twice as much stock as some other land in its neighbourhood, which was equally good, but which was grazed bare. It would be very easy to adduce numberless other facts, which go to show that the herbage of grass or seeds grows more rapidly when it has attained a head; and the same principle is equally applicable to other crops. If you mow vetches, for instance, early in May, and again early in June, the two mowings will not amount to half what the produce would be if cut at one mowing in the latter month. I think I have observed that vetches have doubled their weight sometimes in the last fortnight of their growth; nor does the fact seem at all extraordinary, when we consider that a large plant has so many more leaves and stalks than a small one, and that every one of these more numerous parts grow as rapidly as the first blade which rises from the ground.

If it be admitted, that these opinions as to the different yield of herbage, when treated in different ways, are correct, and that the true cause of such difference is as I have supposed it, the importance of an early crop of rye, which may keep a part of the stock away from the pastures just at the time when it is most injurious to graze them, will at once be seen. You cannot usually depend on a supply of turnips for all your stock through the month of April. If you manure a pasture, and save it from the autumn, it will still not be ready to eat so early as rye by a fortnight or three weeks. If you mow vetches so early, you diminish their yield very greatly. I do not, therefore, think that I over-estimate the value of the rye grown before the Swede turnip when I say, that it is worth twice as much as the same amount of keep at any other part of the year; because, as far as it goes, it enables you to get double the produce from your pastures in the spring.

I grew, this season, a very fair crop of Swedes on the part of my vetches which was first cleared off; but I am of opinion that a full crop of Swedes cannot usually be obtained, unless sown before the

time when vetches are fit to cut; I think, perhaps, you lose more in the turnips than you gain in the vetches. Nevertheless, it sometimes happens that the late sown Swedes are as good, or better than the early sown; and it is not, therefore, amiss to have two sowings at different times, and before the latter sowing, vetches may generally be taken.

With regard to the growing of rye before the early sown Swedes, such a practice can, of course, only be pursued on easily worked land, and on land which is kept so clean as not to require a laborious tillage in the spring before the turnips. I should never think of growing a green crop, unless I got the land tolerably clean in the autumn. By hoeing every crop, and by keeping my land in such condition that the sown crop is always master of the weed, I have never experienced any difficulty in getting my turnip fallow clean after the rye has been taken off; but if I have by chance left my seeds down two years, and the land has (as it always will in that case) become pretty full of couch grass, I have thought it better always to omit the green crop before the Swedes, in order to make more certain of a good opportunity to clean the fallow well in the spring.

I could easily have adduced, from agricultural works, instances of much greater success in the growth of rye for early spring feed than I have myself attained. Indeed, in the last spring, I saw rye in my own neighbourhood high enough to be cut for horses by the middle of April. The harvest had been early, and allowed the seed to be sown in the beginning of September; and as the autumn was open and fine, and the spring favourable, the produce of the early rye was double what is usual. I have however, thought it better to confine myself to my own experience, and have stated what produce I have had in seasons the least favourable, and have endeavoured to show that the cultivation of rye, as an intermediate crop, loses nothing in the worst season, and may be very profitable in a favourable one. With respect to the other subject on which I have ventured to touch—namely, the management of pastures—I shall be glad to learn the opinions of others as to the explanation I have offered of a circumstance which is familiar to us all. If I am correct in stating the weight of grass added to the crop in the latter part of its growth to be so much greater in a given time than when the grass is short; and if this excess of produce is wholly due to the fact, that each individual plant is larger, and, therefore, growing at more numerous parts—the immense loss sustained by eating pastures early, or bare, is easily accounted for. So far as I know, the view I have taken of the fact has not been prominently remarked upon by our agricultural writers; and I am sure it is not kept in

sight in our practice. I am in hope, therefore, that in directing your attention to this subject, I may be better furthering the objects of our club, than by confining myself wholly to the immediate question before us.

Mr. WORTHINGTON: The plan of growing an intermediate green crop seems to me only applicable to small farms, situated, as Mr. Greaves' farm is, close to a town, from whence a supply of manure may be had. This additional crop would require extra manure, which could not be supplied on ordinary farms. On large farms, too, I think there would not be time to sow the rye crop in the autumn, without interrupting the wheat sowing, which is a matter of more importance. The practice of summer soiling has been alluded to, and I had lately occasion to see the operation of this system; and the result was not such as to tempt me to adopt it.

Mr. LANDOR: I agree with Mr. Greaves, that it is highly important to keep the stock out of the pasture land in the spring; and on this account, I am of opinion that you can scarcely estimate too highly the value of early spring feed. Nevertheless, I doubt very much the advantage of growing rye for this purpose, because rye is an exhausting plant; and though it should be fed off with sheep, yet the land would be in some degree impoverished; the crop would consume more manure than the sheep would return to the land. Vetches, on the contrary, are not exhausting; and I should, therefore, prefer to grow them. As to summer soiling, I think the practice of the system is bad, when the grass of the pastures is used; though the land yields more food when so treated, the produce in milk and cheese is not so great. But I have seen the partial adoption of the system, by partly grazing the dairy, and partly soiling on artificial green crops, attended with great success.

Mr. W. GREAVES: I approve of the plan of growing a green crop before the Swede turnip, and rye appears to me to be the best crop to grow. In many districts, the plan is regularly pursued, and rye is almost universally chosen. I believe the crop eaten on the ground would be restorative, and not exhausting. Usually, the time of sowing rye would be earlier than the wheat sowing. In Northamptonshire, I have frequently seen two-thirds of the wheat stubble ploughed for this crop, while the shocks of wheat still stood on the unploughed portion of the land.

Mr. GOVAN: I agree with Mr. Greaves, that the plan of growing rye before turnips may be profitable on his kind of land, situated as it is; but I do not think it would answer, as a general system, on farms placed in ordinary circumstances. The spring eating is very valuable; but as the land on

which rye is grown would require an additional ploughing in the spring to bring it into a fit state for turnips, I doubt whether the expences of the crop would not exceed the value of the keep. I am of opinion, too, that the crop would consume more manure than it would yield, which would again add to the expense. I do not agree generally in the opinion, that a crop eaten on the ground is not exhausting. An instance of the impoverishment of a soil by eating on the ground a crop of rape came to my knowledge. The land was prepared for turnips, but, through mistake, rape was sown. The crop proved very abundant, and the roots so deep and strong, that mattocks were required to clear the land of them. The rape was consumed on the ground; but for seven years afterwards the land yielded little, and was only restored to fertility by extra manure. I therefore conclude, that a crop consumed on the ground does not restore the manure required for its growth. As Mr. Worthington has remarked, the rye would require you to be getting ready the land for it at the particular time when you are busy with the wheat sowing. Considering all the circumstances, therefore, I think the rye would not repay the cost.

Mr. LATHBURY: I think the plan of growing spring feed on the turnip land may be pursued to a great extent on light and suitable soils; and I think the plan equally applicable to large as to small farms. I agree that it is very important to reserve the pastures in the spring; but cows milk better, and yield more curd, when the grass of the pasture is not too high, but only affords a fair bite.

Mr. LEA, of Grantham (a visitor): I am not a practical farmer, but I take great interest in farming affairs; and lately, while in Cambridgeshire, where it is usual to take a half green crop before the turnip, I made minute inquiries to ascertain the merits of the plan. Rye is the crop grown; sometimes rye and seeds; and it is fed off with sheep. It is not thought well to eat it very early, for besides that it would furnish a less bulk of food, the very young rye disagrees with the sheep. The rye should be sown earlier than the proper time for sowing wheat; and the one operation, therefore, need not interfere with the other. I cannot agree in opinion with those members who think the plan is inapplicable to large farms; and it seems to me very easy to find manure. Whatever is laid on this crop will be returned with interest in the spring, for nothing is so grateful as the soil; and if the supply of farm-yard manure be deficient, why not use artificial manures, such as guano or rape? I am of opinion that light lands, which grow rye to be fed off with sheep in the spring, will not require more working in the preparation for turnips than those which have lain fallow all winter; indeed, they will

usually turn up lighter. The succeeding turnips are quite as good after rye; and, on the whole, I believe the system to be very advantageous on all light soils.

It was the general opinion of the club, that a

crop of vetches might always be taken advantageously before the crop of white turnip; and that the system of taking rye before the Swede turnip was applicable to a considerable extent on light lands.

HOLDERNESS AGRICULTURAL SOCIETY.

The following remarks were read by the secretary at the quarterly meeting, 8th December, 1845. The society having completed its 50th year, and the subject for the day's discussion being, "What are the tendencies and what have been the effects of agricultural societies in general, and of the Holderness Agricultural Society in particular." The remarks were ordered to be printed and circulated amongst the members of the society.

Agriculture is the first and most important avocation in human affairs. Man placed on the earth in his natural and primitive state, for satisfying his hunger is dependent upon the uncultivated precarious supply of the fruits of the earth, and the beasts of the field; no sooner he touches upon an artificial state than he discovers that the wants of tomorrow must be provided for by the care and contrivance of to-day. He finds grain spontaneously produced, and his ingenuity prompts him to make it into bread, and then he also finds that to insure the supply which is necessary for future existence, he must sow, reap, and store this grain, and hence springs the science and practice of agriculture. Esau returning from unsuccessful chase, sold his birthright for a mess of pottage. A man may sell his raiment for food, but he cannot sell his food for his raiment. Hunger will compel him to sell his coat for his dinner, but he cannot sell his dinner for his coat. Man must have food.

Upon a late letting of the toll bars on the Patrington road, I took occasion to expatiate on the many superior advantages of this country, and especially on its complete productive cultivation—not an acre being wasted. A rough West Riding man called out "Ye cannot do without ar' chimbleys." My reply to him was, "We can eat our wheat, but you cannot eat your chimneys." Now this brief and homely colloquy of only two sentences, comprises all that the most ingenious essayists, or the most eloquent orators can write or say on the relative position of agriculture and manufactures. Agriculture must of necessity be the first and most important; supply a man with food and he can toil and wait patiently for the manufacture of a web of cloth, but he cannot begin with the manufacture of

this web of cloth and wait for his food. Agriculture is the parent—arts and manufactures are the children, and like other children, being well fed, they sometimes become rather undutiful. To a contemplative mind, it appears matter of wonder that the supply of food should uniformly increase in the ratio of the immensely increasing population, and that provision should be proportioned to want, equally now as a hundred years ago, or at any other more remote period. Whether this is to continue for ever, or whether from an overwhelming population, or a vast or even partial failure of the produce of the fruits of the earth some mighty disruption may ensue, is perhaps, worthy the consideration of the philosopher and the politician. At all events, in the meantime, foreseeing or apprehending such a calamitous doom, the wise and the prudent will direct and employ all the energies of mind and body towards the promotion, encouragement, and success of agriculture.

The fundamental principles of agriculture are few and simple, but they are plain and incontrovertible. 1. To drain the land. 2. To eradicate weeds. 3. To add fertilizing substances when and where required. As to the first proposition, it is plain, that grain will not grow in water, and it hence follows that every gradient between water and dry land progresses in productiveness. As to the second, it is equally plain, that two stems cannot grow in the same place, and hence it follows, that to produce that which is desired, it is necessary to abstract that which is not desired, and which is consequently denominated weed. As to the third proposition many theories are abroad which I don't understand. It has been said in this society that every farmer ought to be a chemist; this I very much doubt, and I am much inclined to believe that the less he dips into abstruse subjects of chemistry, the better; and that he will be found the wisest and most successful farmer, who applies matter to his soil which he knows to be fertilizing, and leaves new combinations and discoveries to men of professed science.

The Holderness Agricultural Society was established the 2nd November, 1795. The originator

and founder of the society was Mr. Stovin, of Boreas Hill, a gentleman cut off in early life, and within little more than a year after he had formed the society. He was a most zealous, intelligent, temperate, judicious, and excellent magistrate, and possessing all the qualifications suitable to a country gentleman, would had he lived, have proved an ornament and a benefit to the sphere in which he moved. The laws of the society emanated from himself, and the progress of the society under those laws, unaltered to the present moment, except in very few unimportant matters of detail, sufficiently attest the luminous, comprehensive genius from which they were dictated.

What have been the tendencies of agricultural societies in general I am not at all able to state, but I am willing to suppose they were the same as our own. What were their effects, it is not easy to ascertain, they having died in infancy; I don't allude to the newly formed *associations*, which are of quite a different constitution to the old *societies*. The tendencies of the Holderness Agricultural Society in particular, have been the promotion and improvement of the science of agriculture, and the effects have been commensurate with that design. This society in the first years of its establishment, consisted of nearly fifty members. Its numbers have gradually increased, and it now consists of upwards of eighty. It has, from the beginning contained an admixture of other professions and men of science from whom much useful knowledge has been constantly derived. The late eminent Dr. Alderson was one of the original formation, and continued a member several years, and many valuable communications of his are to be found in the records. At the commencement of their proceedings, the society gave great promise of usefulness, and the expectation derived from that promise has never after been disappointed.

At the first meeting it was resolved, "That the breed of horned cattle in Holderness had been much neglected; that it was capable of great improvement, and that the members would use their utmost endeavours to restore and improve the breed." At the same meeting a question was discussed, whether Holderness was particularly deficient in any part of its rural economy; and, whether the arable land was capable of any, and what improvement; and it was also resolved, "That a rotation of corn and grass seeds might be very beneficially adopted in Holderness as a general mode of managing land."

Thus the Holderness Agricultural Society propitiously commenced its labours, and the members have continued at each quarterly meeting, to discuss and investigate questions on scientific agriculture, on practical husbandry, and on the selection,

breeding, and rearing of cattle, and they have consequently dealt with two hundred different subjects, exchanging their opinions and experience on each, and by communicating their collected knowledge to others, have diffused through the surrounding country the most approved principles and practice, and inspired a spirit of improvement.

Under these auspices and encouragement the various modes of internal drainage have been adopted, more care has been employed in the culture of the soil and in the eradicating of weeds, the seed system recommended at the commencement, and various other advantageous practices have been introduced, and the breed of cattle and sheep greatly improved.

At the meeting of the society, 1st June, 1796, it was resolved, "That it would be advantageous to the farmers and others in the neighbourhood, and generally to the public, if fortnight markets for cattle were holden at Hedon throughout the year, instead of only from Candlemas to Midsummer, as they had before been held." In consequence of this resolution, the Corporation of Hedon were memorialized and the markets were fixed as desired by the society; the yet continuance of these markets, and the support given to them, is a sufficient proof of their utility.

In the early proceedings of the society the system of under-draining was promoted; Mr. Bell, I believe, was the foremost in performing this important operation; the first I personally observed was on the farm at Nuttles, then occupied by Mr. Thomas Champney. Tiles were not then in use, and the work was performed by covering the bottom grip with an inverted sod, then filling up with thorns, and closing the top with earth.

In 1807, the society commenced giving prizes for the best heifers, bulls, cows, steers, sheep, horses, and pigs, and from thence to the present time, in those prizes have distributed more than 1000*l*.

In 1811, and in several subsequent years, the society gave prizes to ploughmen. The sums expended on these competitions have amounted altogether to about £300, and the operation of ploughing in Holderness was decidedly very much improved and benefited.

In 1819, the society applied to the Board of Agriculture for, and obtained, the gold medal, to be offered for the best cultivated farm within the district. The rules prescribed by the Board of Agriculture were exactly observed; there were many competing claimants, each of whose farms were pronounced to be in the highest state of cultivation, and the medal was awarded to Watson Harrison, the occupier of a farm at Burton Pidsea.

At the quarterly meeting of the society, 19th

December, 1836, it was resolved, "That it would be advantageous to the country to establish a wool market at Hull, and that a committee be appointed to consider what are the proper steps to be taken to establish such market." The committee then appointed, failed to produce in the authorities at Hull a zeal to co-operate in the object of this resolution. The society, however, persevered, and after much discouragement, advertised at their own expense, the commencement of a wool market on the 29th June, 1841. The members of the society engaged to take their clips to this market, and with great assiduity, successfully urged other wool growers in Yorkshire and Lincolnshire to do the same; and thus by the active exertions and influence, and at the cost of the Holderness Agricultural Society, a wool market was established in Hull, which yet flourishes, and is perhaps, one of the best in the kingdom.

And the society have also, at different times, purchased agricultural implements, which were experimentally used by the members of the society, and then sold by auction at the quarterly meetings, the first cost having been about 300*l*.

The society has collected a valuable library containing treatises on subjects connected with rural affairs, which is deposited in a suitable apartment in the Market-place at Hedon, called "The Sensorium." The discussions at the quar-

terly meetings and other proceedings of the society are regularly recorded, and now amount to three folio volumes and the miscellaneous papers, containing amongst them many essays by the members and other men of science and information, are carefully preserved, and will altogether, at some future period, form valuable matter for the historian.

Thus I think it is shown, that during the whole existence of the society, the intelligence and energies of its members have been uniformly employed to promote and encourage the progress and improvement of the cultivation of the soil, and the breeding, rearing, feeding, and quality of the cattle. That their endeavours have been rewarded with success, will I think, be satisfactorily shown by the present state of the country, its crops, its cattle, and its practical systems of husbandry, and especially as compared with their state when the society commenced its labours.

I therefore, do hail with just pride and exultation, the prosperous career and profitable labours of the Holderness Agricultural Society for the duration of half a century, and I do sincerely hope and confidently trust, that this prosperous career, and those profitable labours may long continue, being well convinced that they work well for the advantage of the surrounding country and the benefit of mankind.

ST. PETER'S FARMERS' CLUB.

DISCUSSION ON "TENANT-RIGHT."—Jan.

Mr. SMED said he had been requested to introduce to the attentive consideration of the club the subject of "tenant right." It had been discussed at length at the Farmers' Club House, London, the report of which discussion had been forwarded to him, with the request of the secretary of that society that the subject might be considered here. The President of this club had also requested him (Mr. Smed) to introduce the subject to this meeting, which he would therefore do without further apology.

He presumed the meeting would fully agree with his first statement, viz., that every possible arrangement should be made to secure GOOD FARMING. Rents could not be kept up without it: the heavy expenses of the tenant could be met under no other system: the increasing population of the country rendered it necessary, and this alone could secure the full employment of the agricultural poor.

2. It was not likely that the capital and skill of the agriculturist, and the capabilities of the soil, would be fully developed, unless due attention was paid to the

relative position of landlord and tenant. Indeed he thought it should be forcibly felt by all classes engaged in agriculture, that their interests are mutual, that they rise or fall together.

3. He was of opinion that in a few cases rents are too high under any circumstances over which landlords or tenants have any control. In many cases he thought them too high under existing circumstances over which they have control; but in very many they might be raised, and at the same time the tenant encouraged and benefited, if their circumstances were altered.

4. He believed security of possession to be most important to every occupier of land. Improvement in the condition of the soil is to the farmer what improved machinery is to the manufacturer; nor can there exist proper inducements to the necessary outlay in either case, unless a fair chance is given of obtaining adequate remuneration. A farmer, under any circumstances, risks his outlay; and he has many dangers and difficulties to contend with, unfelt and unknown to mercantile men; but uncertainty of tenure places

him at once in circumstances infinitely disadvantageous: it will be sure to operate on every reasonable mind, in the manifestation of a parsimony incompatible with the best interests of the landlord, the labourer, and the country. On these grounds leases are desirable.

5. If farms are taken on a yearly tenure, there should be given two years' notice to quit, and care should be taken in the agreement that the landlord is not left with a starved farm, nor the occupant without fair remuneration for his outlay.

6. He thought that a tenant leaving should stand on quite as good terms as one coming in; and he knew of no better plan to secure the interests of both these and those of the landlord, than the following:—

- (1). That the outgoing tenant be paid for all work done on the land after his last harvest.
- (2). That all fodder, straw, and manure found on the farm at Michaelmas be taken at its full value.
- (3). That half the value of manures applied the preceding year be paid to the outgoing tenant.
- (4). That all buildings erected by the tenant, or purchased by him of his predecessor, be taken by his successor.
- (5). That the real value of these items be fixed by fair arbitration.

7. He thought the effects of this and similar meetings would prove of greater advantage if they brought the subject before the parties immediately concerned, and promoted their co-operation, than if they promoted any legislative interference. Judicious voluntary arrangements between landlords and tenants would do more good than acts of Parliament; still something was needed to meet cases where persons found in possession of farms are not protected by any sort of agreement with their landlords about the treatment they are to receive on quitting, but are left to the "custom of the country." A legal standard of appeal would be exceedingly useful in such cases. Now the tenant must take just what the landlord pleases to give him, or enter on a contest to which he is unequal, and the very ground on which he stands as unstable as a floating iceberg. He hoped gentlemen would speak freely on the subject this evening, but would recommend them to wait till the London Farmers' Club had collected the information it was seeking, and they felt themselves in possession of more light, before they proceeded to petition Parliament on the subject.

Mr. WM. MANSER, the President of the Club, said, I quite agree in all that has been said by Mr. Smeed. I think the greatest obstacle to good farming is the non-employment of capital, arising principally from uncertainty of tenure; and if any means could be devised to overcome this, so that the tenant farmer could feel secure that he should be reimbursed for every judicious outlay of capital on quitting the farm, it will be a great boon, not only to tenants, but to landlords and the country generally. In my opinion, the outgoing tenant is entitled to compensation for

any increased value that his system of cultivation may have given the farm he has occupied. Were he secure of obtaining this, I feel confident the intrinsic value of landed estates would rapidly increase. I think there are many things that the outgoing tenant ought to be paid for by the landlord, which ought not to be charged to the incoming tenant in any other way than by an increase of rent; for, in very many cases, if the tenant (who may be an industrious, practical, and persevering man) has a large sum to pay on entering the farm, he may be so crippled in circumstances as to be unable to improve the estate, and yet, in justice, he could not object to pay increased rent for the benefit received. This plan would give accommodation to many tenants, and also prove a good investment for landlords, increasing the real value of their estates, while it improved their rent-roll. For the advantage of all parties I would recommend that such a percentage should be paid (whatever the extent of the lease might be), as would wipe off both principal and interest by the end of the term; then the tenant on leaving would, in justice, be paid by the landlord for all work done for the benefit of his successor, and for all unexhausted improvements, as Mr. Smeed has stated; but, above all, the full value should be paid for straw, fodder, and manure; and every inducement should be given to secure good farming to the end of the lease.

A long discussion ensued, at the close of which it was proposed by Mr. J. C. Bennett, seconded by Mr. N. Bradley, and carried unanimously, "That, as the opinion of this Club is fully embodied and expressed in what has been said by Mr. Smeed and Mr. Manser, the secretary be requested to forward their speeches to the secretary of the London Farmers' Club, as explanatory of the views of this Club on the subject."

GROVE FERRY FARMERS' CLUB.

DISCUSSION ON "TENANT RIGHT," FEB. 5, 1846.

RESOLVED—

1. That this club is of opinion that tenant right should embody all the improvements made upon the land by the tenant, either by draining, levelling, grubbing, manuring, chalking, liming, and building, and from which he has not derived a full remuneration.

2. That the tenant be by law entitled to receive from the landlord a full compensation for this outlay, of which he has not had time to repay himself.

3. That it is essential in making a valuation between landlord and an outgoing tenant that the actual condition of the farm compared with the state of cultivation it was in when entered upon, should be the basis of such cultivation.

THOS. SLATER,

Preston, Wingham, Kent, Feb. 12.

Hon. Sec.

DEEP DRAINING IN STIFF CLAYS.

TIPTREE-HALL FARM.

As there still exists amongst agriculturists a strong doubt whether water will percolate through cold putty-like clays, I will, for the benefit of the community at large, communicate the results of my draining operations during the past year. I have drained thirty-three acres of some land I rent adjoining my own, finding it unprofitable to farm such soil in its undrained state. The draining cost me £3 per acre, including pipes and every expence, as follows:—Digging drain, placing pipe, and filling in, 6d. per rod of 5½ yards; cost of pipes, of 1 inch bore and 15 inches long, 15s. per 1,000.

The drains are placed 33 feet asunder. We begin to cut as low as the ditch or outfall will permit, and work into the rising ground until we reach FIVE FEET in depth from the surface; the pipes are butted against each other—no stones or bushes placed over them—nothing but the clay is returned into the drain. I have several times examined these drains after rains during the last three months, and find they run admirably, like so many tea-pots—leaving the surface dry enough for us to plough, trench plough or subsoil, which we have been doing the last five weeks, in preparation for beans. The soil is a very strong brown brick earth, varying occasionally to a yellow colour, with much iron in it. I should strongly recommend those who are doubtful about the best and cheapest mode of draining strong clays, to inspect the drains on my Tiptree-hall Farm, which they are quite welcome to do at any time, and so satisfy their minds. The question of getting the water through dense soils is a vital one to the interests of agriculture. The difference in the wheat crop this year, between the drained and undrained land on my farm, is fully one quarter of wheat per acre and one load of straw, being more than the whole cost of the drainage.

It is amusing to hear the doubts, arguments, and disbeliefs of the majority of agriculturists, when they see a small pipe the size of one's thumb placed at so great a depth as five feet in such a soil, whilst others cannot imagine that an inch pipe is large enough to carry the water. I have never yet, however, seen them run more than half full, although possibly when, in the course of years, the soil becomes, as it will, more friable, water must have a freer access to them. We have the authority of Mr. Josiah Parkes, whose calculations cannot be controverted, that one inch pipes at 33 feet apart, and four feet deep, will carry off all the water that does fall from the heavens on a given space in a given time. I consider the disbelief as to the possibility of draining heavy lands a great misfortune and curse to our country. If there are 24 millions of acres cropped annually with corn, and 12 millions of that land require draining, I am quite sure the increased quantity of corn in a cold wet season would be 12 million quarters (I mean of wheat, beans, oats, and barley), and on grass lands in proportion.

There is something very absurd in the assumption that clays are impervious to water; such opinions will not bear the test of reason. How often one hears "O! but water can't get through my soil;" well, then, if water cannot get in, how

does it get wet? Perhaps the same person will tell you that he has built a wall or shed of clay lumps well dried, and that it requires all his ingenuity to keep the water from getting into it, by thatching, tarring, and a brick foundation. It is true clay already saturated with water will hold water on the surface like a basin, for a very good reason, that it is already full of water and cannot take in any more; but once provide the means of escape under clay, with alternate dry and wet days, and it would puzzle a conjuror to keep the water from sinking through it. If any man doubts it, let him dig an under-ground cellar in clay, and see if he can keep the water from coming in, even though well bricked.

Tapping the land when full of water is, after all, like tapping a cask—the liquor runs out at the bottom and the cask dries at the top. The deeper the drain or tap, the greater the pressure from above. As the liquor flows the air must follow. If you doubt it, consider that no liquor can flow out of a cask if you keep in the vent peg and prevent the air entering. Independent of the capillary reasons why deep drains act best (as explained in my 18th letter), we must consider that the deeper the drain the more steep the incline; and we all know that water will rush quicker down a steep hill than a gentle slope. Those who consider one inch pipes too small would find how soon such a pipe running constantly would empty a large pond. Of course, where springs are to be drained, the size of the pipe must be regulated by the quantity of water. It is well known in sewerage, that small drains, if not too small, will keep themselves clear better than large ones; and as to expense, why, it must be had policy to use large pipes and large cuttings, where small ones will answer better—no rats or vermin can enter one inch pipes. It is lamentably painful to contemplate the condition of our heavy undrained lands during a wet winter. Look at them now, filled with water to the surface, consequently unable to receive or appropriate that best of manures, the heavenly rain. Every hasty or continuous shower scours the surface, driving down the furrows in turbid and wasteful streams, the very essence of the soil—those finely comminuted, disintegrated, and valuable particles, which the farmer has, with so much perseverance and costly labour, exposed to the vivifying and advantageous action of atmospheric alternations. But let us carry our perspective to the months of March, April, and May. Is the prospect less dismal and distressing? No! the blessed sun shines on the sodden and saturated soil; but it is dead and impervious to its invigorating rays. The imprisoned water having no escape downwards, can only be released as steam by evaporation, carrying with it the heat which should warm the soil, and leaving behind a death-like coldness, which is well attested by the sickly and yellow plants. Poor things, many die, leaving their hardier companions to struggle on in hopes that a parching summer may do that naturally by gaping cracks, which man is too poor, too niggardly, too ignorant, or too prejudiced, to effect by cheap and profitable drainage.—*J. Meehi, 4, Leadenhall-street.*

ARTIFICIAL GUANO.

Our attention has been called to a new manure, this week, which the inventor calls "Cooke's London Guano." The manner in which it is made is at present a secret, but if it can be made at the price the inventor states, viz., 3*l.* per ton, it will certainly be one of the most valuable manures that has ever been seen in this country. We have seen an analysis made of it by Dr. Ryan, of the Royal Polytechnic Institution, which we insert:—

ANALYSIS OF COOKE'S GUANO—ROYAL POLYTECHNIC CHEMICAL SCHOOL, LONDON.

This is to certify that I have examined a specimen of Cooke's Guano, sent by Mr. M. Joscelin Cooke. Its composition is as follows:—

Ammonia.....	10.0
Uric acid.....	7.4
Oxalate of ammonia.....	17.6
Phosphate of lime.....	16.7
Oxalate of lime.....	6.1
Sulphate of lime.....	6.2
Nitrates of soda, potash, and lime.....	10.0
Silica, alumina, and iron.....	9.0
Moisture.....	17.0
	100.0

The ammoniacal compounds in this article, called "Cooke's Guano," are in very unusual quantities: the phosphate of lime exists also in large abundance. Compared with natural guanos it holds an unusually high fertilizing rank.

JOHN RYAN, M.D., LL.D.
ROBERT LONGBOTTOM, Sec.

309, Regent-street.

And in order that our subscribers may judge of its merits, we insert an analysis of a first-rate sample of Peruvian guano, extracted from Liebig's Chemistry—

ANALYSIS OF A SAMPLE OF PERUVIAN GUANO; FROM LIEBIG'S CHEMISTRY.

Urate of ammonia.....	9.0
Oxalate of ammonia.....	10.6
Oxalate of lime.....	7.0
Phosphate of ammonia.....	6.0
Phosphate of ammonia and magnesia.....	2.6
Sulphate of potash.....	5.5
Sulphate of soda.....	3.3
Sal ammoniac.....	4.2
Phosphate of lime.....	14.3
Clay and sand.....	4.7
Water and organic matters.....	32.3

Any party examining these will see how superior this London guano is to the foreign, in those essential ingredients which constitute the real value of guano. In the manufacture of artificial manures hitherto it has been the object of the manufacturers to bring their manure as near to the superior qualities of guano as they could; but here we have one actually superior, and that to the best sort imported into this country, viz., the Peruvian. We have seen a sample of it; in appearance it is black and pulverulent, and has a strong and peculiar smell. We are informed it is made from the excrementitious matter, as found in the sewers of London, such as urine,

night-soil, and offal, which is treated in a peculiar manner with a cheap chemical agent. The inventor and manufacturer, Mr. M. Joscelin Cooke, has also discovered that the same agent he employs to treat these matters, and form a manure, is also peculiarly applicable to treat the contents of the London sewers; and so instantaneous is its operation on sewer water, which is known to contain a most valuable manure, that the instant it comes in contact with it, it precipitates all the thick and valuable matter out of it, and leaves the supernatant water perfectly clear. Several experiments have been made by him on the sewer water from the different sewers in London, which clearly prove this to be the case. If this can be carried out—and we have seen a plan for it also prepared by the same party—we think we may state that our agricultural friends will find sufficient manure in England, quite equal to guano, without going abroad for it. London is alone supposed to be equal to produce 400,000 tons per annum of this manure; and it can be made in any of the large towns of England. Mr. Cooke expresses himself ready to submit it to any test, and is anxious to get some capitalist to join him in carrying out the invention; he likewise states, he can, by the same agent, produce a manure suitable for any soil; but he has one that will do for soils generally, and for all crops.

MODE OF CULTIVATION ADOPTED IN CORNWALL TO RAISE EARLY POTATOES.—

1. The potatoes are set in December and January.
2. The sort planted are the kidney, and the ash-leaf kidney. The best ash-leaf kidney are procured from Somersetshire, and are planted in the neighbourhood of Uxbridge.
3. The best soil is a light loose soil, and the ground should be well worked. Old grass-land is preferred.
4. The seed should be set about eight inches in depth, four inches distance from each other, and the rows fourteen inches apart. An open situation, facing south or south-east, in the best situation—proximity to the sea is the most advantageous.
5. The best manure is long stable dung covered with sea-weed, the seed being first slightly covered with earth.
6. The finest, cleanest, healthiest seed is best. When cut, never plant a piece with more than two eyes: some prefer one. When small potatoes are used, they are sometimes planted whole.
7. To protect the tops from being injured by early spring frosts is impracticable in extensive plantations; but, in small quantities, they may be protected by being planted in sheltered situations, and litter kept over them, or by trenching them as celery, and covering the trenches with litter transversely till the weather becomes warm.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A monthly council was held at the Society's House in Hanover-square, on Wednesday, the 4th of Feb. Present—The Right Hon. Lord Portman, president, in the chair: Earl Grey; R. Archbold, M.P.; Thos. Raymond Barker, Esq.; J. R. Barker, Esq.; S. Bennett, Esq.; H. Blanchard, Esq.; W. R. Browne, Esq.; F. Burke, Esq.; Col. Challoner; F. C. Cherry, Esq.; Sir T. Drake, Bart.; A. E. Fuller, Esq., M.P.; H. Gibbs, Esq.; C. Hillyard, Esq.; W. Fisher Hobbs, Esq.; John Hudson, Esq.; G. Kimberley, Esq.; J. Kinder, Esq.; C. Pocock, Esq.; F. Pym, Esq.; Professor Sewell; W. Shaw, Esq.; J. V. Shelley, Esq.; Geo. Turner, Esq.; T. Turner, Esq.; T. R. Tweed, Esq.; H. Wilson, Esq.; and W. B. Wingate, Esq.

Finances.—Mr. Raymond Barker presented to the council the report of the Finance Committee, from which it appeared that the amount of capital invested in the public funds stood at 8,200*l.*, with a current cash balance in the hands of the bankers of 1,695*l.* The council confirmed the recommendation of the Finance Committee, that 1,200*l.* stock should be sold out of the funded property of the Society for the purpose of removing the temporary inconvenience occasioned by the excess of the expenditure over the receipts at the Shrewsbury meeting chargeable on the funds of the Society, and which at that time had amounted to 1,600*l.*, independently of the 1,000*l.* contributed by the town of Shrewsbury towards the expenses of the meeting.—On the motion of Mr. H. Gibbs, the various financial returns (of which a detailed statement was given in our last report) required in his notice of motion, of the 3rd of December last, were ordered to be laid quarterly on the table.—On the motion of Colonel Challoner, a statement of the ordinary income of the Society for the past year, apart from income arising from the payment of arrears of subscription, should also be prepared. The council ordered further that a list of all members in arrear of subscription should lie constantly on the council table for public inspection.

Newcastle Meeting.—The President having laid before the council a communication from Sir Matthew White Ridley, Bart., Chairman of the Newcastle Local Committee, on the subject of the date of the meeting, it was unanimously decided by the council that the annual country meeting of 1846, for the Northern District (comprising the counties of Northumberland, Cumberland, Durham, and Westmoreland, and the town of Berwick-on-Tweed) should be held at Newcastle-on-Tyne in the week commencing on the 13th of July next; the principal day of the show, and that of the pavilion dinner, being Thursday the 16th of that month.

A letter having been read from Mr. Frere, in reference to railway accommodation and conveyance to the place of meeting, the Secretary was directed to enter into communication with the various railway companies, and the

Newcastle Local Committee, on the subject, and report the result of his inquiries to the council at their next monthly meeting.

The following communications were received:—A letter from Mr. Pusey, M.P., to the President, announcing the preparation of a report by the Analysis Committee, on the best course to be pursued in the present state of the inquiry respecting the Ashes of Plants. Letters and Specimens of Draining Tiles, addressed to the Duke of Richmond, by Mr. Johnson, of Northampton. A recommendation from Mr. Thompson, of Moat Hall, that the county of York should form one of the districts for the country meetings of the Society. A suggestion from Mr. Martin, of Kingston House, Dorchester, that engravings should be published of the prize implements of the Society. A printed report from Mr. Dean, of the Proceedings of the Land Agents' Society. A letter from Dr. Dewhurst, offering to deliver lectures before the Society. Plans from Mr. Harrison, of Devizes, of Cattle Sheds, Manure Tanks, &c. Papers from Mr. Dickson, on the Cultivation of Flax. An offer from Mr. Stothard, Medal Engraver to the Queen, of unappropriated medal dies for a royal medal. An offer of services from Mr. S. Curtis, of New South Wales, in reference to the promotion of the objects of the Society. And an intimation from Dr. Calvert, that if the arrangement should be approved by the Council, he would willingly communicate, in a Lecture to the members at the ensuing Newcastle Meeting, the result of his inquiries and practical trials on the subject of the best Grasses for cultivation.

The Council then adjourned to Wednesday, the 11th of February.

A Weekly Council was held at the Society's House in Hanover-square, on Wednesday, the 11th of February, present: Thomas Raymond Barker, Esq., in the chair; B. Almack, Esq., T. B. Browne, Esq., Rev. T. C. Browne, F. Burke, Esq., F. C. Cherry, Esq., C. Cure, Esq., W. Cuthbertson, Esq., P. Fearnhead, Esq., A. Fraser, Esq., A. E. Fuller, Esq., M.P.; H. Gibbs, Esq., W. Leveson Gower, Esq., W. G. Hayter, Esq., M.P.; E. Hussey, Esq., J. Kinder, Esq., Sir Robert Price, Bart., M.P.; Prof. Sewell, Sir Richard Simeon, Bart., S. Solly, Esq., T. Thomas, Esq., T. R. Tweed, Esq., and J. L. Wight, Esq.

The following communications were received:—

1. A letter from Mr. Rodwell to Lord Portman, the President of the Society, containing his further results in the cultivation of the varieties of Italian Rye-Grass.

2. A statement from Mr. Shepherd, of Shaw End, near Kendal, of the extensive depredations committed by rats in that part of the country, and of the means taken for their destruction.

3. An offer from Mr. Braley, one of the librarians of the London Institution, to deliver lectures before the Society, on the origin and the natural history of clay; or more generally, if required, on the process and results of the disintegration of rocks, as connected with the production of soil; the subjects to be treated in reference to the geology, mineralogy, and mineralogical chemistry of the arts and of agriculture, and illustrated by specimens, maps, diagrams, drawings, and numerical tables, as well as elucidated by the exhibition of such direct experiments as the topics investigated may require.

4. A letter from Mr. Bullen, Secretary to the Royal Agricultural Improvement Society of Ireland, transmitting the prize sheets of that Society for the ensuing year, and calling the attention of the members to the prizes placed at the disposal of the Council of that body by his Excellency Lord Heytesbury, for the encouragement of thorough-draining in Ireland.

5. A recommendation from Sir P. Micklethwaite, Bart., that it should be suggested to railway companies to remove two spits of the top surface of the land on which the superstructure is to be placed, for agricultural purposes.

6. Mr. Turner communicated his plan of forming a new and economical manure.

The Council then adjourned to Wednesday, the 18th of February.

A Weekly Council was held at the Society's House in Hanover square, on Wednesday, the 18th of February; present: His Grace the Duke of Richmond, in the chair; B. Almack; G. T. Raymond Barker, Esq.; T. H. Bateman, Esq.; S. Bencraft, Esq.; W. R. Browne, Esq.; F. Burke, Esq.; H. Burr, Esq.; Dr. Calvert; F. C. Cherry, Esq.; W. Cuthbertson, Esq.; A. E. Fuller, Esq., M.P.; H. Gibbs, Esq.; B. T. B. Gibbs, Esq.; W. Fisher Hobbs, Esq.; J. Kinder, Esq.; O. Ogilvie, Esq.; John Reed, Esq.; Professor Sewell; W. Shaw, Esq.; W. R. C. Stansfield, Esq., M.P.; T. P. Stone, Esq.; T. Turner, Esq.; and T. R. Tweed, Esq.

Country Meetings.—Mr. Mason, Town Clerk of Doncaster, addressed a communication to the Council, soliciting, on the part of the corporation of that borough, that one of the country meetings of the Society may be held at Doncaster, at some future time, when the new succession of districts throughout England and Wales for the holding of the Society's country meetings after 1847 (when the present schedule ends) shall have been determined upon.—The Council ordered that the Rotation of Districts' Committee should be summoned to meet on Monday, the 2nd of March.

Prize Barley.—Earl Spencer transmitted his Report of the cultivation of the Barley selected by the Judges at the Southampton Meeting for trial along with the local varieties commonly grown in the neighbourhood of the respective parties appointed by the Council to undertake the task of instituting such trial. This report was reserved for consideration until the other communications on the same subject have been received.

Potato Disease.—Mr. Browne submitted to the inspection of the meeting some specimens of diseased potatoes, and stated that he had taken them from a heap which had lain together for upwards of two months without any increase of the disease. The Duke of Richmond drew the attention of the meeting to an ingenious plan which was practised in American families, by cutting off the stem end containing the eye of the potato, and employing the remainder for culinary purposes. The portion thus cut off was thrown into a vessel containing lime and charcoal, for the purpose of preserving it for seed. His Grace also stated that, not having found the potatoes in the north of Scotland affected by the disease, he had secured a supply for introduction into the county of Sussex as seed for his future crops. His Grace further stated that the Duke of Portland having made many experiments relative to the disease in potatoes, he would take an early opportunity of requesting him to favour the Council with a report of his results. An interesting discussion then took place, in which Mr. Raymond Barker, Mr. Stansfield, M.P., Mr. Fuller, M.P., and Dr. Calvert detailed the results of their respective experience of the potato disease.

After referring to the diversified results of the last potato crop, the various prices at which potatoes were offered for sale in different parts of the country, and the success which had attended the cultivation of the ash-leaved kidneys in Buckinghamshire, where one person, at Aylesbury, had grown upwards of 300 sacks of that variety, all of which a fortnight ago were perfectly sound, Mr. Raymond Barker, in alluding to the best means for securing an adequate supply of good sets for future use, mentioned the result of an experiment he was induced to make about ten or twelve years ago, when there was a considerable scarcity and a very backward spring, on hearing of the satisfactory result of a similar trial made a few years previously to that date by a friend of his at Reading. Having prepared the ground in uniform tilth and dressing, and planted longitudinally four rows of equal length, with—1st, whole potatoes of a fair size; 2nd, halves of similar potatoes cut into two; 3rd, cut eyes, such as those commonly obtained when economy of seed is a consideration in the planting; 4th, eyes extracted by a scoop; Mr. Barker obtained the following results:—By the last process (No. 4) he retained for use in the family nearly the whole of every potato, and had an abundant supply; from Nos. 1 and 2 of course nothing could be saved; and from No. 3 scarcely a centre now and then for the hog-bucket. On digging up the crops, and carefully weighing the produce of equal lengths of the rows of the four systems, Mr. Barker found the result to be greatly in favour of No. 4, over two of its competitors, and his impression was that there was no material difference as to the other one; but his primary object at that time being to ascertain the practicability of effecting the saving of the food without the loss of a future equal crop, he supposed that he was not very careful in observing the difference of results among the other rows. Mr. Stansfield's observations had reference to his own experiments on diseased potatoes, and his fear of the consequences, should the disease be

liable to be propagated by cultivation. Dr. Calvert had found charcoal preserve, while peat-earth considerably injured, the potatoes embedded in it.

Conditions of Draught.—Mr. Bencraft having submitted to the Council a detailed explanation of the principles on which his hames and new saddle were constructed, and of the beneficial results which had attended their trial under various circumstances, an interesting discussion ensued, in which the Chairman, Mr. Fisher Hobbs, Mr. Turner (President of the College of Veterinary Surgeons), and Mr. Cherry (Principal Veterinary Surgeon to the Army), stated to the Council the result of their experience respectively, on the subject of draught and harnessing. Mr. Cherry also presented to the Society (in reference to papers on the subject of one-horse carts in the last part of the Journal of the Society) copies of his various published, as well as privately printed works, on the best mode of constructing a cart for hospital service, and of transporting by vehicles, or on the backs of animals, the personal baggage of the army.

Mr. Glover, Secretary of the Newcastle-upon-Tyne Farmers' Club, transmitted a copy of the regulations of that institution.

The Council then adjourned to Wednesday, the 25th instant.

NEW MEMBERS.

David Jones, Esq., of Glanbrane Dark, Llandoverly, Carmarthenshire, and William Marshall, Esq., M.P., of Patterdale Hall, near Carlisle, were elected Governors and the following gentlemen Members of the Society:—

Anderson, William, Bent House, South Shields, Durham
 Angeworth, William, The Hay, Bridgnorth, Salop
 Arundale, Charles, Seaton Burn Farm, Newcastle-on-Tyne
 Bell, Matthew, M.P., Wolsington, Newcastle-on-Tyne
 Buller, James Wentworth, Downes, Exeter, Devon
 Butland, William, Cliff Cottage, Langhorne, Carmarthen
 Cargey, George, Sandon Hall Farm, Stone, Staffordshire
 Chapman, Charles, Exton, Stamford, Lincolnshire
 Cleiland, Major-General, Walton-upon-Thames

Cookson, William, Beuwell Lodge, Newcastle-on-Tyne
 Coxe, Lieut. James (27th Foot) Newtown Lodge, Hungerford,
 Berks

Craig, J., Quatt, Bridgnorth, Salop
 Curties, Rev. Thomas Chandler, Liuton Vicarage, Bromyard,
 Hereford

Cuthbert, William, jun., Beaufront, Hexham, Northumb.

Easton, Abel, Strathfieldsaye, Hartfordbridge, Hants

Farhall, Richard, Billingshurst, Sussex

Ferrabee, John, Phoenix Iron Works, Stroud, Gloucestershire

Ferguson, Daniel, Northallerton, Yorkshire

Gibson, George, Kendal, Westmoreland

Glover, William, Northumberland-street, Newcastle-on-Tyne

Grenfell, Charles Pascoe, 38, Belgrave-square

Grey, The Hon. Capt., F. W., R. N., Howick, Northumberland

Hutton, Rev. Henry, Rectory, Filleigh, South Molton, Devon

Jones, John, Pant-y-Corred, Brecknockshire

Jones, John, Blannose Villa, Llandoverly, Carmarthenshire

Keen, Thomas, Croydon, Surrey

Knupe, J., Eccleston-street South, Belgrave-square

La Beaume, M., 11, Argyll-street, London

Lee, Edward, Stockfield Hall, Newcastle-on-Tyne

Loscombe, Francis, Goodworth, Chatford, Andover, Hants

Machin, John Vessey, Gateford Hill, Worksop, Notts

Mackworth, Sir Digby, Bart., Glamusk, Caerleon, Monmouth

Merrick, J., Windsor, Berkshire

Miles, Charles, 93, Great Russell-street

Muggeridge, Henry, St. Andrew's-hill, City

Newman, Sir Robert William, Bart., Maulhead, Exeter

Onslow, Rev. Charles, Church-Knowle, Wareham, Dorset

Ormston, Robert, Newcastle-on-Tyne

Overend, Willson (J. P.), Sheffield

Pattisson, Jacob, Witham, Essex

Pugh, William, Coalport, Ironbridge, Salop

Read, George, Easton Hall, Norwich

Reeks, James, Standen, Hungerford, Berks

Smith, William, Burton, Belford, Northumberland

Stevens, J. Curzon Moore, 2, Harcourt-buildings, Temple

Thompson, Andrew, Woodford, Kettering, Northampton

Timings, Richard, Warton, Bromyard, Hereford

Walker, William, Wilsie, Doncaster, Yorkshire

Williams, Evan, Rhayader, Radnorshire

Wollen, Joseph Wedmore, Cross, Somersetshire

Wright, John, Chipping-Ougar, Essex

Wynne, William W. E., Mount Sion, Oswestry, Salop.

ON TREE PLANTING.

If one were permitted to form an estimate of seasons from a comparison of the meteorological phenomena of different localities, I should say—judging from the immediate vicinity of my own residence—that the month of March, even in its earliest days, is too late for the safe removal of most deciduous trees or shrubs; because, during a term of almost sixteen years, I have observed but two of those years wherein there was a fair alternation of the genial showers and sunny gleams which constitute a true “spring,” and secure, nearly to a certainty, the success of every well-performed operation. Drenching and cold rains long pro-

tracted, and their opposites—fierce, parching winds, with a burning sun, have characterized by far the greater number of the years. To plant, therefore, in March—a season which, *par excellence*, ought to be dry and windy—in land reposing upon a substratum of gravel, must be dangerous, unless April kindly brings with it those showers for which, in the olden time, it was famed: but when, in lieu of showers, April is perfectly arid, not only danger, but almost certain destruction must be the result.

There are other localities far different from that of East Berkshire, wherein both soil, subsoil, and atmosphere are more suitable and moist: I there-

fore shall now allude to two *deciduous shrubs*, both of them extremely ornamental, which may in most years be removed with a fair promise of safety, and to one *evergreen* of surpassing beauty; reserving other subjects of the latter tribe for a future notice.

First, of deciduous plants. There are two varieties of the genus *ribes*, both of modern introduction, which ought to be found in every garden.

1. The first is the Golden-flowered Ribes, (*R. aureum*) introduced from Missouri, in 1812. It is a strong, rather coarse-growing shrub, which attains 8 or 9 feet in height, but blooms when much short of that. It produces suckers in abundance, which rise strong from the beginning, and can be safely transplanted even when the roots are few in number. The wood is erect, yellowish-brown; the leaves smooth and glossy, three-lobed, toothed; bracts long; flowers pale yellow, self-coloured at first, but the tint of the corolla heightens in a few days, and then becomes edged with scarlet. The odour of the blossom is sweetly fragrant. The season of bloom is during April and May. Smooth berries, few in number, on short racemes are occasionally formed, and ripen; but I have seldom seen them. This plant suits shrubberies, or shrub borders, introduced among evergreens. It is, however, rarely cultivated; perhaps in consequence of its rambling suckers, which yet are very easily regulated.

2. Red-flowering currants (*Ribes sanguineum*), found by the late Mr. Douglas—or rather, the seeds were transmitted by him, in 1826, to the London Horticultural Society. Mr. Paxton figured this shrub, in No. 1 of his "Magazine of Botany," and stated it to be native of various parts of North America. It is perfectly redolent of bloom; its strong, pendent racemes, comprising ten or twelve richly tinted crimson flowers, emerge from the angle of almost every leaf, or pair of leaves. The buds are produced very early in the year, yet rarely expand till April. The tree, however, is perfectly hardy, and might be trained with a single stem, to the height of sixteen feet. The "Murphy winter" of 1838 did it no injury; and one I have in a bed, which was then a small shrub, is now a tree of very considerable size, that has bloomed profusely every year, and nearly at the same period, however stern might have been the preceding frost. The colour of the flower varies from pale purple to full, rich pink. Mr. Paxton presumes that Mr. Douglas was perfectly correct when he observed that "if the bushes were planted in soil having a portion of lime rubbish mixed with it, the blossoms would be more profuse, and probably of deeper colour." Our soil, or loam, has chalk in it; but I have found, that in whatever soil the plants grow, with me, they are

healthy and full of bloom, whether they stand in an open exposure or repose under the shade of laurels and in close shrubbery. The stems are brownish grey, mottled; leaves lobed, downy, with a defined odour of black-currant. The berries here are abundant: they are large and beautifully coloured, the ground being a coating of opaque French-white, over a dark purple husk, abounding with bristly procepes, which cause each berry to appear like an elegantly spotted bird's egg, about the size of a tontit's.

The Holly-leaved Berberry (*Berberis aquifolium*) is perhaps the handsomest evergreen which our gardens can boast of. Leaves winged, leaflets ovato-lanceolate, flat, deeply and regularly toothed, remarkably shining, of a full olive green, turning richly purple during winter. It blooms most freely, even when very small. As a proof, I have before me a plant—a perfect bush—about a foot high: it abounds with low, scaled, branchy shoots, flexible, so as to be layered round the main stem; and all of these are now showing single racemes of expanding, yellow blossoms. Nothing can exceed the beauty of larger bushes, three or four feet high, full to the base with perfect foliage, contrasting with the rich lemon tint of numberless blooms; and equally so with the dark, glossy berries that ripen abundantly in autumn. Any good loam suits this evergreen, and so would heath-soil and vegetable mould. In hedges, or as a solitary bush, or interspersedly planted in shrubbery, it is always in its place, orderly in figure, and never intrusive. Some persons say it is difficult of culture: we find it to root by layers; and as its seeds ripen freely (though birds are equally aware of the circumstance), if carefully collected a large progeny may be so raised. It is native of North-west America, introduced about twenty years ago.

J. TOWERS.

PRODUCE OF SWEDISH TURNIPS ON A SQUARE PERCH.—Ballinasloe, 2nd Fe.—Sir,—I beg to enclose you the weight of the produce of one square perch of Swedish turnips, deprived of tops, tails, and dirt, taken out of the middle of a moory field of 1½ acres which I have been pulling this day, as I found they were very perceptibly starting to seed, owing, I believe, to the present mild weather. I pledge my word that, with the exception of putting six or eight sound ones in place of six or eight that were rotten, that the rest was done under my own inspection, with the greatest accuracy, and shows the enormous weight of 9 cwt. 2 qrs. to the perch, or 76 tons to the acre; and any portion of the field, with the exception of the ends of the drills, was just as good as the perch that was measured. The manure applied was farm-yard, and clay compost, and a sprinkling of malt, combing on the top.—Yours, &c., WILLIAM BOYD. P.S. I forgot to mention that the number of turnips in the 9 cwt. 2 qrs. was 226. W. B.—Irish Farmers' Gazette.

METEOROLOGICAL DIARY.

BAROMETER.			THERMOMETER.			WIND AND STATE.		ATMOSPHERE.			
Day.	8 a.m.	10p.m.	Min.	Max.	10p.m.	Direction.	Force.	8 a.m.	2 p. m.	10 p. m.	
	in. cts.	in. cts.									
Jan.	21	29.34	29.16	38	52	52	S. West	brisk	cloudy	cloudy	cloudy
	22	29.04	29.20	51	51	48	West	brisk	cloudy	cloudy	cloudy
	23	29.23	29.20	43	50	47	S. West	lively	cloudy	cloudy	cloudy
	24	29.37	29.65	42	50	44	West	gentle	cloudy	cloudy	fine
	25	29.38	29.20	44	52	50	S. West	gentle	cloudy	cloudy	cloudy
	26	29.18	29.18	46	47	47	S. West	brisk	cloudy	cloudy	cloudy
	27	29.32	29.60	41	49	46	N. West	lively	cloudy	cloudy	fine
	28	29.43	29.53	41	49	42	West	lively	cloudy	sun	fine
	29	29.38	29.66	39	50	45	West	lively	cloudy	cloudy	fine
	30	29.90	29.90	39	50	50	Westerly	brisk	cloudy	cloudy	cloudy
	31	29.98	29.81	47	49	49	Westerly	brisk	cloudy	cloudy	cloudy
Feb.	1	29.83	29.85	45	47	40	Westerly	lively	fine	sun	cloudy
	2	29.64	29.90	38	44	39	N. by E., S	gentle	cloudy	sun	cloudy
	3	29.90	29.71	37	48	47	South West	variable	cloudy	cloudy	cloudy
	4	29.99	30.00	38	44	39	W.S.W.	lively	fine	sun	cloudy
	5	29.74	29.80	37	44	41	W.N.W.	gentle	cloudy	cloudy	cloudy
	6	29.91	30.00	34	45	43	W. by N.	lively	fine	sun	cloudy
	7	29.85	29.94	43	56	42	W.N.W.	strong	cloudy	cloudy	fine
	8	29.98	29.33	34	34	32	N. by W.	lively	fine	sun	fine
	9	30.10	30.18	28	36	28	N. by E.	lively	fine	sun	fine
	10	30.30	30.30	25	33	28	N. East	gentle	fine	sun	fine
	11	30.16	30.06	25	40	35	N. West	gentle	fine	cloudy	cloudy
	12	30.09	30.13	26	42	38	N. West	gentle	cloudy	cloudy	cloudy
	13	30.11	30.11	38	45	42	W.N.W.	gentle	cloudy	cloudy	cloudy
	14	30.10	30.18	33	44	41	W.N.W.	gentle	cloudy	cloudy	cloudy
	15	30.23	30.23	31	44	40	N. West	lively	fine	sun	cloudy
	16	30.23	30.20	37	44	43	N. by W.	gentle	cloudy	cloudy	fine
	17	30.00	30.06	41	49	42	N. by W.	gentle	cloudy	cloudy	cloudy
	18	30.00	30.00	39	45	41	N. by W.	gentle	cloudy	cloudy	cloudy
	19	30.00	30.00	39	44	45	West	gentle	cloudy	cloudy	cloudy
	20	30.02	30.06	39	46	43	South	variable	cloudy	cloudy	cloudy

ESTIMATED AVERAGES OF FEBRUARY.

Barometer.		Thermometer.			North and N. East Winds.. 6 days. East and to South 5½ South and South West..... 7¼ West and to North 9¼
High.	Low.	High.	Low.	Mean.	
30.807	29170.	53	21	36	
Real Average Temperature of the above period.					
High.	Low.	Mean.			
46	38	42			

WEATHER AND PHENOMENA.—Jan. 21.—Wind and much rain. 22.—Improved, but changeable. 23.—Small rain at times. 24.—Some sun. 25.—Rain last night and this forenoon. 26.—Wind and rain last night. 27.—Improved. 28.—Changeable—sun—gleams—rain. 29.—Profuse rain early. 30.—Mizzling rain—wind. 31.—Cloudy—changeable—wind at night, as has been generally the case for some weeks. Feb. 1.—Finer—lunar halo at night. 2.—Profuse rain in night—fine day. 3.—Redsun—rise—cloudy—damp day. 4.—Fine day—halo—cirrus clouds. 5.—Much rain last night—gloom. 6.—Fine day—driving cirro stratus in evening. 7.—Shower. 8.

—Snow—scuds—first wintry day. 9.—Keen frost, and a little snow. 10.—Very keen. 11.—The same. 12.—Frost abates—the days have never been frosty. 13.—Sober, overcast day. 14.—The same. 15.—Rime, only for a few hours. 16.—Rather fine morning—cloudy day. 17, 18, 19, and 20.—All alike—consistent—gloomy, but drying.

LUNATIONS.—Jan. 27: New moon, 9h. 23 m. morning. Feb. 3: First quarter, 5 h. 11 m. morning—full, 11th day, 9 h. 12 m. morning—last quarter, 19th day, 4 h. 44 m. morning.

REMARKS REFERRING TO AGRICULTURE.—The great quantity of rain which fell during the

latter weeks of January saturated the land, and floods prevailed in the river valleys. With February the weather improved; but there were five or six of its earlier days on which some rain fell. Flood-water passed away, and the land became

mellow; but everywhere, we discern, by the tintings of the ploughed ground, how great is the call for drainage; without it, perfection cannot be looked for. The crops, under all circumstances, are of fair promise.

CALENDAR OF HORTICULTURE.—MARCH.

RETROSPECT.—The very great fall of rain after the middle of January, which had completely saturated the ground, and made it almost impossible to touch the surface, abated at its close, and, as was natural, made the dry weather of February very acceptable. The air became cooler, and in the second week there were two or three successive and rather smart night frosts, which gave a seasonable check to vegetation in garden and field. February is, or ought to be, a dripping month, and so far the year has been “out of sorts”—an unfavourable prognostic for that seasonable, bracing, and dry weather of March, which affords so excellent a promise.

It was curious to observe the slow progress which the buds of trees and shrubs made during a great part of January—a progress by no means corresponding with the high temperature of the air (not, in fact, below that of a cold July!). Suddenly, however, as if by magic, buds swelled, nature acquired an impulse which threatened the development of blossoms, and the “flying up,” as it is termed, of many garden vegetables to seed. Broccoli came on rapidly; and heads, large and white as those of an ordinary cauliflower, were far from rare in the first week of last month. The few frosts, of 6°, 7°, or 8°, were then most seasonable, especially as the wind came steady from a northerly point, and consequently cooler on the whole. Still, however, the season is remarkable, and we have only to hope that it may be propitious. Potatoes still decay; but all tend to grow; and, therefore, if the vital parts can be preserved sufficiently long, they may be trusted to raise the middle early planting of March.

VEGETABLES RAISED BY HEAT.

Our forefathers were much more adroit in forming hot-beds than are gardeners of the modern school; and the reason is obvious—namely, because it has been found advantageous, far less troublesome, and more sightly, to adopt the practice of forcing in brick pits. But where manure is plentiful, as in the farmstead, and economy rules absolute, it is well to be made thoroughly aware of the method formerly practised by such men as Abercrombie, who in his day might be reckoned

little inferior to that “prince of gardeners,” Miller, the renowned author of “The Gardener’s Dictionary.”

Cucumbers and melons were raised and successfully cultivated by these patriarchs of the gardener; and premising only that tree-leaves, especially those raked off an extensive grass surface, like that of a park, are essential meliorators of manure, we think that the following extract from “Mawes Gardener,” last edition, may be perused with manifest advantage:—

“Choose a place on which to make a hot-bed in a sheltered dry part of the melon-ground, &c., open to the morning and south sun; then, according to the size of the frame, mark out the dimensions of the bed, either on the ground or with four stakes, making an allowance for it to be two or three inches wider than the frame each way; this done, begin to make the bed accordingly, observing to shake and mix the dung well as you lay it on the bed, and beat it down with the fork as you go on; but I would not advise treading it, for a bed which is trodden hard will not work so kindly, and be more liable to burn than that which is suffered to settle gradually of itself.”

The state of the dung must, however, be previously considered; it should be that of the stable, moderately fresh, moist, full of heat, taking long and short together. If, however, it be rank, it will be proper to fork the whole well over, blending and incorporating one-third part of leaves, and placing the mass in heap, there to let it remain for eight or ten days to foment equally, by which time it may either be turned over again, or formed into the bed as before directed.

Earthing the bed.—After the work is finished, and if the manure settles evenly, cover it with fine rich mould, prepared either of loam and decayed manure, long mellowed together, or with thoroughly decayed couch-grass roots, which ultimately yield a soil eminently favourable to the cucumber. The frame, meanwhile, should be placed on the bed for a time with the lights on, in order to cause the heat to rise freely; and during this time the fine-screened earth is placed under an airy shed to dry sufficiently. Then take off frame and light, make the surface

smooth, replace the frame, and cover the manure with the prepared earth four inches deep; fill three or four small pots with the same earth, place them in the frame, and when the soil is warm, sow cucumber and melon seeds, two or three in a pot, carefully marking the sorts. Some care is required to prevent scalding the young plant by over heating, and air must be given occasionally.

Cucumbers are thus raised by seeds sown from October to March, but melons rarely prosper till February or March. Cucumbers raised early are transplanted on ridges raised in new beds prepared for the purpose at the commencement of March.

In brick-pits heated by dung linings raised all round the outsides, assisted by gentle hot water heat inside, cucumbers, &c., are now generally raised, and trained upon a trellis, with great facility and much cleanliness; but persons must act according to their means.

Mushrooms succeed best in small shelved houses furnished with troughs or deep trays to receive the best droppings of the stable, and the fresh covering loam. Such houses are heated to 50 or 55 degrees by a hot water pipe, passing through the middle or around it. External beds are poor things; but a melon frame, when the dung has become moderately cool, answers well.

OPEN GARDEN.

Transplant cauliflowers from frames, or from under hand-glasses; the exposure should be warm, and the ground rich in manure. As the plants grow, manure-water from dung-hills, or made by infusing an ounce or two of guano in a large pot of soft pond water, is very excellent. But though it is right to transplant supernumeraries, one single plant ought still to be retained under each hand-glass.

Sow broccoli for earliest winter crops; also some cabbage seed; transplanting other cabbage of August sowing, either to fill up blanks, or to make new beds. Cabbages may stand one foot asunder in the rows, these being eighteen inches distant, row from row. Sprinkle guano, weakened with three times its bulk of sawdust, charcoal-dust, or sifted earth, over the surface between rows of autumn-planted brassicas of all kinds; then hoe, or fork-dig the ground.

While recommending guano—believing it, if good, to be the most comprehensive of all manures for very light top-dressing—it will be proper to say that some of it is in the state of a fine pale brown powder; while other samples abound with lumps of saline, grey-white substances, so hard as to require considerable force to break them: such ought always to be beaten till as small as common salts, prior to being diluted with three times their bulk

of one or other of the ingredients before mentioned. Sow spinage, lettuce, salading, radishes, onions, beet-root, carrot, parsnep, once or oftener, at any convenient time during the two middle weeks of the month.

Sow peas and beans twice, earthing-up, and sticking as required.

Celery and celeriac should be transplanted from the seed pans, into nursery beds, or the latter in its final situation at once.

Sow parsley, purslane, and all the sweet herbs; though most persons, in respect to the last, prefer rooted suckers, or root offsets.

At the end of the month fork asparagus beds or rows, turning the loosened soil into the manured alleys; then level and rake the beds.

New beds or rows may be prepared for by deep trenching, bottom manuring, and by the introduction of a body of new turfy leaf to create a deep staple. Saline adjuncts to a very liberal quantity of fold or stable-dung, thoroughly blended with the loam, promise permanent fertility; such salines are Potter's guano or bone-dust, either with or without sulphuric acid, and a tenth part of common salt. About a gallon would do for every single row of 18 inches wide, 24 inches deep, and six yards long. Three times this quantity would, of course, be applied to a three-row bed; the ground must settle till April.

Artichoke.—Clear away decayed leaves, and point with a fork three inches of rotten manure as top-dressing.

Sea-kale.—Cut over such plants as are used for the season, turn the loose earth into the intermediate spaces, top dress with weakened guano or bone dust and some salt mixed with fine loam, and rake the surface.

FRUIT DEPARTMENT.

Apricot, peach, and nectarine, finish pruning; wash the trees with soap-suds or lime-water, and fork the border lightly; then mulch the surface over the roots. Prune and regulate the fig-tree, and finish with apples and pears, being very particular to keep, or to make, the spurs very compact, and to train the leaders of espaliers in neat regular order.

Strawberry borders, beds, and rows, should be cleared with a wooden rake, trimming off long dead strings and leaves; the surface ground should be carefully raised with a small fork, eradicating grass, crow-foot, sow-thistle, &c., &c., all of which take free possession of strawberry-ground; finally, top dress with two inches of light loam, wherewith a pound of guano to every moderate barrow of earth, or twice that quantity of bone-dust, with some short decayed manure, may be mixed with the best effect.

FLOWER GARDEN.

Sow every kind of annual seed in pans or pots, placing them in the mild heat of a frame either warmed by water-pipes or dung-lining. All the hardy herbaceous plants can be safely introduced or increased by division of roots after the 21st; but as to annuals, there is much more security in trusting to the method above recommended than by sowing seeds in the open border.

American shrubs, and indeed all evergreens, can be planted now; the shrubberies may be pruned, and put in trim order; and the ground can be fork-digged, introducing a fair proportion of old rotted cow manure.

Take great care of auriculas, carnations, &c., in pots, guarding them from cold driving rains and sleet showers. Do the same by the best bulbous plants, particularly when the flower-buds are seen.

Repair box-edgings; sweep and roll lawns and gravel walks; suffer no grass to intrude on the latter.

GREENHOUSE AND COOL PITS.

Give plenty of air, but prevent ingress of rain.

As plants grow, re-pot, top dress, and give water.

Guano used with great caution, as liquid manure, may always be substituted for the draining of dung-hills; but it should be recollected that nearly 40 per cent. of the guano consists of salts soluble in water, sulphates, muriates, phosphates of potassa, soda, and ammonia, while the insoluble remainder consists chiefly of bone phosphate and urate of ammonia. Hence, one ounce in three gallons of soft water, stirred up, giving here a little and there a little with the utmost care, would confer rich elements to anything that requires a liquid aliment.

FORCING DEPARTMENT.

Keep the heat lively in the earliest vinery, but less moist than in the second; maintain 70° to 80° in melon and cucumber pits, and an equally high temperature in the fruiting pine-stove.

As to succession pines, we used to be told to *disroot!* But why? What good can arise from the destruction of every imbibing and absorbing organ? True it is, that if plants have been rendered torpid by cold atmosphere and a cold bed for the three months past, the roots may now be black and dead. But if a lively heat and steady advance have been maintained, nothing can be required but a timely shift into moderate-sized pots, using pure turfy loam with a little bone-dust and charcoal as drainage, trusting to manure water for future progressive enrichment.

At the time we finish this article, there is a continuance of the sober rather gloomy atmosphere so prevalent of late; the temperature also has greatly exceeded the ordinary average, and is about 10 deg. above that of 1845.—Feb. 19.

AGRICULTURAL QUERY.

TO THE EDITOR OF THE FARMER'S MAGAZINE.

SIR,—Wishing to steep my seed-barley and oats, and being a "young farmer," I shall feel obliged if any of your valued correspondents will favour me with the best and most approved method. I have lately used sulphate of copper for my wheat, at the rate of half a pound per bushel. Fearing that would be too large a quantity for spring-corn makes me anxious to obtain better information than I am possessed of; or perhaps there is some other manure better adapted than the one I mention.

Sir, your obedient servant,

O. S. P.

ANSWER TO AGRICULTURAL QUERY.

TO THE EDITOR OF THE MARK LANE EXPRESS.

SIR,—Mr. Playford, of Hendenham, near Bungay, had very recently, and probably has yet, some genuine specimens of the old Norfolk ram inquired for in your paper of the 26th.

The curious in ancient breeds of stock will be well repaid by a moderately long journey to Hedenham Park, as there neither the cattle nor the sheep seem to have been selected for the vulgar purpose of paying rent, but to preserve in these iron times a few samples of the stock of ages long gone past.

Yours faithfully,

A SUBSCRIBER.

Jan. 28, 1846.

GUANO v. MANURE.—On reading the report of a trial made with guano and stable manure, on a crop of Swedes, at the late dinner of the Agricultural Society, by Mr. Nicholas Le Ceir, Secretary of the Guernsey Royal Agricultural Society, I could not but be surprised at the result in favour of guano, and which I calculate as follows:—

STABLE MANURE.

15 tons, at 4s. each	per English acre, £3	0	0
Cartage of manure, at 1s. per ton,		0	15
Labour of spreading manure, 3 me.		0	5
work, at 1s. 8d. each,			0
	Total	£4	0

GUANO.

150lbs. of guano, at 10s. per cwt., . . .	0	15	0
Cartage, and labour of spreading, . . .	0	1	0
		0	16
		£3	4
To which add the difference of crop in favour of guano, say 6 tons 2 cwt. Swede turnips, at 15s. per ton,		4	11
			6

Total amount in favour of guano . . . £7 15 6 per English acre, or 3l. 2s. per veré, one-third more than the yearly rental of the land. Surely, with such a golden return, our farmers can no longer be blind to the value and almost miraculous fertilizing qualities of guano.—An Agriculturist in the Guernsey Star.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR FEBRUARY.

The continuance of unusually mild weather, the time of year considered, has had the effect of producing most abundant supplies of grass throughout the whole of England; indeed, we seldom or never recollect to have witnessed such an immense available supply of pasture and other food for live stock as during the month just concluded. Vegetation in general has, as might be expected, proved unusually forward; indeed, the whole face of nature reminds us of our being in the middle of spring rather than at the close of February. Notwithstanding this forward state of things, the accounts which have reached us from most quarters relative to the appearance of the young wheat plants are favourable, and they are reported as progressing rapidly.

The early lambing season has been productive of a fine fall of lambs; and it affords us great pleasure to state that, owing to the openness of the weather, very few losses have been sustained.

The various corn markets have been but moderately supplied with English wheat, yet the demand for that article has been in a sluggish state, at about stationary prices.

The supply of barley has been great; hence, the sale for it has ruled heavy, at a decline in value of from 2s. to 4s. per quarter.

Full average supplies of malt have been on show, and which have sold slowly, on somewhat easier terms.

For oats—the arrivals of which from Ireland have been considerably on the increase—we have to report a dull sale, at a depression in value of from 1s. to 1s. 6d. per qr.

Both beans and peas have been purchased on easier terms; while flour has been a mere drug.

Our advices from Scotland and Ireland are to the effect that considerable heaviness has prevailed in the corn trade, and with it, prices have again retrograded for most descriptions, with fair average supplies on offer.

The lengthened debate in the House of Commons, on the subject of the corn laws, and the almost certainty that Sir Robert Peel's measure will receive the sanction of the legislature, have produced an excitement in the agricultural world almost without a parallel. Although many parties appear, from their inertness, to have settled down to their future fate, it is most gratifying to find that the representatives of most of the agricultural

districts have fearlessly done their duty, in opposing a measure fraught with injustice to the farmers of England. Without denying the existence of distress in Ireland, we are still of opinion that the rumours as to the extent of the failure in the potato and other crops, have no positive foundation in truth. Now, it occurs to us, that were the people of that country on the eve of famine, efforts would have been made to keep back some portion of the immense supplies of grain and other produce which are almost daily finding their way into our various ports. From a return lately issued by the Board of Trade, we perceive that the receipts of all kinds of grain, as well as flour and live stock, during 1845, were considerably in excess of those in any former year. Surely this does not savour much of scarcity. As to the supplies of grain in the hands of our farmers, we have every reason to know they are tolerably good. What, then, in this state of things, will be the result of the passing of the measure now under the consideration of the Legislature? The quantity of wheat and other grain that will be released at a low duty within six weeks from this time, will exceed 1,300,000 quarters; consequently, it is fair to presume that prices will fall considerably below their present level, as we must not forget that, in addition to the above quantities, very large supplies are now on their way hither from America and elsewhere. We look, then, upon this scheme as fraught with great injustice to the home growers. The other alterations proposed in the tariff are equally subversive of their interests.

NORTH NORTHUMBERLAND.

In our first report from this district for the year '46, it is our pleasing duty to return thanks to Divine Providence for the almost uninterrupted continuance of fine weather since the commencement of the year. During the entire month of January, out-door work in every department was carried forward, and we never recollect any season in which farm-work and vegetation had made such progress as in the past (first) month of the year. February came in with a "bit storm," a heavy gale from N.E., with smart showers of sleet, hail, and snow, which lay on the high grounds for a few days; but so moderate has been the temperature, that we cannot observe the slightest check put to the growth of the turnips, which are (even on high situations) running fast to a flower stem. For the last few days the weather has

been very fine. Late-sown wheats have come up healthy and strong; but we observe many fields (autumn-sown) where the plant looks thin, but it is too early to speculate on the appearance of the wheat plant. As it is, a great breadth of this staple *grain crop* will be sown in fine condition this week. New grass and old pastures (where uneaten) present a full bite for sheep. Turnips are more plentiful than expected last autumn; and should the fine genial weather continue for a few weeks, those left on the land will be alike valuable to the *bee fancier* and the flock master. Markets have kept steady, with an upward tendency for fat in all the border markets held lately. Sheep are wanted, and beef is selling at a price remunerative for the feeder; the grain crop, however, will *tell tales* when the spring rents begin to fall due. The yield of wheat is greatly complained of; and the bulky crops reaped last harvest all

over the fine lands of Bamberghire deliver a poor acreage produce in the thrashing barn. Oats and barley yield better, but prices are receding. Potatoes are not much grown in this district as an article for sale: last year's crop lifted from the field was unusually great, but like "men and measures," they were only a "shadow of things to come." Where the crop was lifted and carried in the usual way to the pit, they very soon went to corruption, but when carefully stored in dry granaries, or sheds, and turned, picking out the diseased tubers, they have kept tolerably well, and we shall at least have seed with a spare one for the table. Labourers are fully employed; the line of railway now forming through this county has taken all the extra hands, and wages are on the advance. Draining is now costing for labour one-third more than at the same date last year.—B. Feb. 16.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

The ministerial proposition to admit foreign stock into this country free of duty, and the great increase which has lately taken place in the imports of human food, have, as might naturally be expected, formed the subject of serious discussion amongst the agricultural community during the whole of the past month. In the observations which we shall offer to the consideration of our readers on this all-important question, we shall not allow ourselves to be led away by the sophistry of the opponents of British industry; but confine ourselves to undeniable facts. In the first place, it becomes necessary for us to expose a series of glaring inaccuracies which have appeared in the columns of the *Times*, which has asserted that "the importations of live stock for the London market continue on a very limited scale." Now, we are prepared to prove—and which we shall presently do from the returns derived from official sources—that these, during the present year, have greatly exceeded those of any previous season since the passing the new tariff. But the *Times* goes on to assert, "The importance of admitting foreign cattle into England free of duty begins to wear the aspect of unquestionable necessity. *The stock of cattle, and sheep in particular, in the country is at this present moment so immeasurably below the demand, that the prospect of an extraordinary rise in the price of mutton and meat generally is no longer a question of doubt, but clear certainty, unless some means be taken to meet the consumption. It is doubtful, however, if even the proposed measure of the Premier will be adequate for the pressing exigency of the case; for it is well known that the surplus stock of cattle in Holland, France, Spain, or Germany is small, compared with the enormous*

consumption of meat in this country, and which surplus only, it may be expected, will come to this country." Whence this sapient scribe has derived his agricultural *knowledge*, we are at a loss to divine; but in this instance he has displayed as great a density of ignorance of the whole matter as could well be conceived. What does he mean us to infer from "the stock of *cattle* and sheep being so immeasurably below the demand?" If reference be made to the arrivals of beasts up to Smithfield and our other large markets of consumption in the provinces, it will be seen that the supplies have not fallen off to any great extent; indeed, we have every reason to know, taking into consideration the quality of the stock, that the actual weight of meat disposed of has been *above* that of the average of ordinary years! Perhaps, however, the writer in the *Times* will not perfectly comprehend us, though it must be quite as clear to him as the "*great fact*" he announced some months since, to the effect that "an arrival of stock for the metropolitan market had taken place from *Calcutta!*" To show the absurdity of such a statement, we may intimate, for the amusement of our readers, that the expense of shipping an ox from the above-named port would be somewhere about *one hundred pounds!* As to the available supplies of beasts in this country, we have no hesitation in saying they are not deficient, but the principal reason that the actual numbers brought forward have not been considerably on the increase, is principally the result of the immense available supplies of dry and succulent food on almost the whole of our large stock-farms. Such is the abundance of turnips, &c., that it is found almost impossible to consume them. The causes to which we have before

alluded, viz., the great drought experienced in 1844, which compelled the flockmasters to send their sheep to market in a half-fat state, and thus submit to ruinous losses, have, we admit produced a scarcity of sheep in most districts, and a corresponding decrease in the supplies disposed of in the metropolis and elsewhere; still, is it reasonable to suppose that such a deficiency will continue after another good lambing season? As respects "the surplus stock of cattle in Holland, France, and Germany," we are perfectly aware that in the two former countries, it is by no means large; but what is the case in the latter, whence eventually our principal imports will be derived? Now, it is well known that immense numbers of both beasts and sheep are available in Germany; and so soon as our import duties are abolished, larger droves will speedily find their way into Holland, and be fattened in that country preparatory to their being exported to England. This is not an idle assumption; and, further, we have no hesitation in saying that we could readily draw 20,000 beasts, and 100,000 sheep annually from the Dutch ports, without producing any material rise in the value of stock, either in Germany or Holland. We look, therefore, upon the proposed measure of Sir Robert Peel as one sure in its fatal effects upon the interests of the English grazier; and we have a full conviction that, in the course of years, it will materially reduce the value of live stock in this country. Allusion has been made to what has been termed a considerable advance of late in the value of sheep, but we maintain that no actual rise has taken place in it during the last six weeks, for, though the quotations obtained for the live sheep have been good, it must not be forgotten that the offal has become much more valuable than some time since; hence the advance is more imaginary than real.

During the month just concluded, the imports of live stock into London, and at the outports, have been again on the increase—they having amounted to 1,094 beasts, 1,693 sheep, 20 calves, and 62 pigs, from Hambro', Rotterdam, Harlingen, and Scheidam, in fair condition. In February, 1845, we received 478 oxen and cows, together with 581 sheep, from which it will be seen that we have an increase this season, in beasts of upwards of one hundred, and in sheep of three hundred per cent.

From our own districts the receipts of stock up to Smithfield have been as under:—

Beasts	13,140
Cows	590
Sheep	78,270
Calves	640
Pigs	2,031

At the same period last year the supplies were as follows:—

Beasts	13,879
Cows	527
Sheep	119,950
Calves	659
Pigs	2,159

From the above, it will be seen that the only actual deficiency—as we have before observed—has been in sheep. On the whole the general demand has ruled steady, though, at the close of the month the quotations were barely equal to those at its commencement, if we except the prices of sheep, which were 4d. to 6d. higher, at which, however, some difficulty was experienced in effecting clearances.

The monthly comparison of figures stands thus:—

	Per 8lbs. to sink the offal.			
	Feb. 1845.		Feb. 1846.	
	s. d.	s. d.	s. d.	s. d.
Beef.....	2 6	to 4 2	2 6	to 4 2
Mutton....	2 8	4 4	3 6	5 6
Veal	4 0	5 4	4 2	5 4
Pork.....	3 0	4 4	3 10	5 2

The bullock droves, since our last, have thus come to hand from the following counties:—

Norfolk, Suffolk, &c	4,800 head.
Northern counties	2,100
Western do.....	2,650
Other parts of England....	1,400
Scotland	400
Ireland	130

The remainder of the supplies have been derived from abroad, and the neighbourhood of London.

Up to Newgate and Leadenhall markets, the receipts of country-killed meat have been somewhat on the increase, and of improved quality. Generally speaking, the demand has been in a sluggish state at our quotations. Beef, from 2s. 6d. to 3s. 6d.; mutton, 3s. 6d. to 4s. 8d.; veal, 4s. 4d. to 5s. 4d.; and pork, 3s. 8d. to 5s. 2d. per 8lbs. by the carcase.

The country supplies of meat have been thus derived:—

	Beasts.	Sheep.	Calves.	Pigs.
Scotland.....	103	1060	—	1270
Yorkshire	113	1312	—	1750
Lincolnshire	136	400	—	350
Norfolk	96	280	—	320
Suffolk	95	260	—	310
Cambridgeshire..	136	350	—	260
Essex	70	270	150	420
Surrey	140	420	220	850
Devonshire	—	—	—	280
Wiltshire	200	370	145	430
Other parts	230	630	270	900

REVIEW OF THE CORN TRADE

DURING THE MONTH OF FEBRUARY.

The majority by which Sir Robert Peel is expected to carry his motion in the Commons, renders it probable that no effectual opposition to the measure will be offered in the upper House, and the corn-laws of 1842 may therefore be regarded as virtually repealed.

History scarcely affords a parallel of political dishonesty at all to be compared to that displayed by the present Ministry to the agricultural interest. They obtained power solely on the understanding that they were prepared to uphold adequate protection to native industry. That was the watchword which enabled Sir Robert Peel, on former occasions, to command his overwhelming majorities; and though he soon began to exhibit his leaning to free trade by introducing the new tariff and Canadian corn bill, still no one suspected that he could so far forget the interest of the party by whose means he obtained his strength, as to propose a repeal of his own enactment, brought forward little more than three years ago, as a final settlement of the question. Admitting that the failure of the potato crop in Ireland is to the full as serious as it is represented to be, surely a temporary evil might have been met without permanently altering the laws regulating the import of corn. If there really be grounds to apprehend scarcity, our Government might have taken the same steps as several of the continental governments have been forced to adopt, namely, opened the ports for a given period, say till next harvest, though we are far from allowing that any such course would have been necessary, as the regular working of the system on which the law of 1842 is framed, would have caused the duties on grain to have fallen to the minimum point before prices had risen to a height likely to occasion serious inconvenience to the consumers. It is however of little avail to argue the matter; the example set by the Prime Minister has been followed by many who stood pledged to a contrary course, and henceforth the heavily-taxed British farmers will have to compete with the comparatively untaxed foreigner.

That the ultimate result of the rash experiment will be detrimental to all classes of the community, including the prime mover (the manufacturer), is more than probable; but, owing to the unusual circumstance of a deficient harvest over the greater part of Europe, the full extent of the mischief may not for some time be developed.

We shall here take our leave of politics, believing that our readers are as much disgusted with the subject as ourselves.

In commencing the regular business of our monthly retrospect, the weather engages the first place. Rarely have we experienced a more open, and on the whole favourable winter. Should there be no severe frosts in March, the spring must be an unusually early one. The wheat plant has not received a single check; its aspect is everywhere vigorous and healthy, without being prematurely luxuriant. Quite the usual breadth of land is under this crop, and up to the present time there is every promise of future abundance.

All kinds of green crops have, throughout the winter, been plentiful, and keep for cattle has been abundant. The mildness of the season and the profusion of grass have greatly lessened the necessity for stall feeding, which has been a considerable saving to farmers. The preparation of the land for spring sowing has also been carried on under highly auspicious circumstances; and from present appearances it seems that the Lenten crops will be got in early, and in first-rate condition. Thus far, therefore, our prospects are cheering, and were it not for the storm in the political horizon, the British farmer would have little cause to be dissatisfied with the opening of the year 1846. The depreciation which has taken place in the value of his produce since the beginning of November (when it was first rumoured that the Government contemplated making a material alteration in the laws), has, however, injured the growers of corn very severely in a pecuniary point of view; the price of wheat has since then been reduced fully 10s. per quarter, and other descriptions of agricultural property in nearly the same proportion. If this had been the effect of a large yield, the extra quantity would, of course, in a great measure, have compensated for the lowness of price; but as regards wheat, it has repeatedly been admitted that the crop of 1845 was decidedly deficient of that of average years.

So completely have all our previously conceived notions been upset by political events, that we feel more than ordinary difficulty in forming our opinion respecting the probable range of prices during the time which must elapse before another crop can be gathered. On the whole, we are, however, disposed to adhere to what we have on former occasions expressed, viz., that the late fall has not

been warranted on the grounds which usually operate to produce a depression; and we cannot but think that, sooner or later, this will be found to be the case. If, as is generally supposed, the produce of wheat in Great Britain has really been defective, it is not very easy to determine from whence supplies are to reach us to make up for the deficiency. In Poland the scarcity of food is stated to be so great, as to have hurried the people into revolt; and the export of all kinds of grain, excepting wheat, has been forbidden from that country. Latterly the Prussian Government has deemed it prudent to put a stop to shipments of grain from the Rhenish provinces; and instead of Holland drawing supplies from that quarter, the Dutch merchants have been sending wheat up the Rhine. It seems pretty clear, therefore, that before England can expect to have her wants supplied by shipments from the north of Europe, prices will have to advance here considerably above their present level. If we turn our attention to the Mediterranean, affairs will be found to present nearly the same features; nor do we think that the shipments from North America—of the extent of which so much has been said—will be so overwhelming as represented, unless American shippers are assured of a higher return for their goods than prices in our markets at present can lead them to expect.

By the foregoing remarks, we do not wish to be understood to say that Great Britain would experience any difficulty in importing a million, or even two millions of quarters, if it should be found that we really required assistance; but merely that she will have to pay high to secure even the first-named quantity, and that any fall from present rates is consequently improbable. The trade in wheat has nevertheless remained in an extremely inactive state since we had last the pleasure of addressing our readers, the previous depression having been rather added to by the protracted debate on the corn-law question, there being, up to the present period, a feeling of uncertainty how the matter will be ultimately settled.

The arrivals of wheat coastwise into London have not been large; but, as compared with those of the month immediately preceding, an increase is shown. A large proportion of the supply has been from Lincolnshire, Cambridgeshire, and Norfolk, most of which has gone direct to the millers without appearing at Mark Lane for sale. The actual operations in the market have therefore been unusually small; indeed, the system of buying free on board on the coast is gradually becoming more general, and the business of the English factors is daily decreasing. Whether the Essex, Kentish, and Suffolk farmers have so far reduced their stocks as to have become indifferent about selling more at pre-

sent rates, we have no data to determine; but certain it is, that they have for some time past sent comparatively little grain to market. On no occasion during the month has the show of samples from these counties been large; still, as before remarked, the demand has been of so restricted a nature, that the moderate receipts have not been felt as an inconvenience. The tendency of prices has, however, rather been upwards, particularly for good qualities. On the first Monday in the month (the 2nd), factors succeeded in placing the finer sorts at rates 1s. to 2s. per qr. above those previously current, but it has since been impossible to exceed the prices of that day. The attempt was made both on the 16th and the 23rd, and in some instances a trifle more may have been realized for choice dry samples of white; but so far from any rise having occurred in the value of the ordinary runs, we question whether the terms at which sales have recently taken place have been quite equal to those realized in the commencement of the month.

The indifferent condition in which most of the home-grown wheat has come to hand has rendered it very unfit for grinding, without a mixture of old. Duty-paid foreign, of good quality, has consequently been in fair request. The continued drain of the finer sorts (for the purpose of mixing), ever since last harvest, has so reduced the stocks in granary, that it has recently become difficult to obtain even tolerable parcels; and, as the ordinary sorts have been wholly neglected, the transactions in free foreign have been less extensive than would otherwise have been the case. In bonded wheat the operations have also been on a restricted scale, and we rarely recollect a period at which so little disposition has been shown to enter into speculative investments. Considering that wheat under lock has throughout the month been freely offered at least 10s. to 12s. per qr. below the rates at which the same qualities have been held free; and that most parties look upon it as nearly certain that Sir Robert Peel will carry his measure reducing the duty at once from 17s. to 4s. per qr., it is certainly singular that so little speculation should have taken place. The explanation, is, however, to be found in the state of the money market; the great difficulty which has existed in obtaining the usual facilities, and the consequent caution which merchants and factors have been obliged to use in entering into fresh engagements. Under these circumstances, the business done in bonded wheat has been principally in retail, for the purpose of being immediately released for home consumption, the want of fine quality having been so great that millers have been compelled to adopt that course to obtain the requisite quality for mixing. In

these cases the current duty has, however, not been paid, the object having been effected by bonded certificates, at a cost of from 11s. to 12s. per qr.

The demand for flour has, throughout the month, been exceedingly slow, the mildness of the season and the abundance of vegetables having sensibly diminished the consumption of bread. Up to Monday, the 23rd, the nominal top price of town-manufactured flour was kept up at 56s. per sack; on that day the principal millers put down the quotation 3s., but even the reduced rate is still too high, in proportion to the prices at which country-made flour has been selling. Good Norfolk households have at no period during the month commanded more than 42s. per sack in the river, and lately 40s. to 41s. has become the current selling price. In the early part of February, United States flour in bond was generally held at 30s. per barrel; subsequently holders gave way 1s. to 2s., when a speculative demand ensued, and lately several thousand barrels have changed hands, under lock, at 28s. per barrel. At Liverpool the article has been sold even cheaper, say 26s.; and, as most of this flour must have been bought at high rates in America, the importers must have been heavy losers. Large as the quantity of wheat and flour in the United Kingdom is, it would scarcely suffice for the consumption of the inhabitants of Great Britain for a month; if, therefore, the statements of the minister respecting the probable want which may hereafter be felt, owing to the failure of the potato crop, be not greatly exaggerated, farmers have not much reason to be alarmed at the extent of the stock of foreign bread-stuffs.

Notwithstanding the very important fall which has recently taken place in the value of barley, the growers have continued to supply the different markets freely with this grain; in some parts of Norfolk, good 50lbs. feeding qualities have actually been sold at the low price of 23s. per qr., and the finer descriptions have declined in nearly the same proportion. The arrivals of barley into London have been on a very liberal scale, and having previously rather a large quantity on the market, the greatest difficulty has been experienced in effecting sales. Even the best malting qualities, which, up to the close of January, commanded comparatively high rates, have receded materially. Good malting parcels have recently been sold at Mark Lane, at 34s. to 35s. per qr. On the ordinary sorts the fall has been still greater: indeed, for some weeks past common kinds of barley have been literally unsaleable. There can be no question that the depression in this grain has been considerably heightened by the fear that the admission of Indian corn at a nominal duty will cause large imports of the latter article, which would of course have the effect of in-

terfering with the sale of all articles used for feeding purposes. The languid state of the barley trade has naturally influenced quotations of malt. The fall on the latter article has, however, not been nearly so great as that on the former, good brown malt having at no period been sold in the London market below 53s., while the best pale Ware has been held at 62s. to 63s. per qr. In addition to the other causes calculated to produce a depression, the failure of a house largely engaged in malting was announced in the early part of the month.

During the first fortnight in February, the arrivals of oats into London were small, and an opinion began to prevail that Ireland was not in a position to afford us our usual supply. Within this week or two we have, however, received a large quantity from thence; and the latest advices from the sister isle admit that rather important shipments were still in progress for the English markets. This certainly does not look much like famine; but if it should be urged that the fact of the Irish exporting their grain at a period of great internal necessity only proves the extent of their poverty, we answer that government would do better to purchase the grain there, and afterwards sell it again at a moderate price, to alleviate the wants of the people, than purchase Indian corn in America, as it is reported to have done for the purpose of feeding the distressed Irish. The trade in oats at Mark Lane has remained in a very quiet state throughout the month. At one time there was some appearance of the market becoming bare, and in partial cases a trifling advance on the rates current at the close of January were obtained. This, however, was by no means general. Lately the dealers have acted with so much caution, that in cases where, in consequence of the expiration of the lay days, it has been necessary to get vessels cleared, factors have been compelled to submit to a decline of 6d. to 1s. per qr. Of foreign oats the arrivals have been unimportant; and at present there are very few in bond in the United Kingdom.

Beans continued to recede in value till near the close of the month, when a somewhat improved demand sprung up: still no rally has as yet taken place in the value of the article. The duty has risen rapidly, and is at present 7s. 6d. per qr.

Though the supplies of peas have been moderate, and an opinion prevails that later in the year they will, owing to the large shipments made in the autumn to Holland and Belgium, run short, still peas of all descriptions have up to the present time been difficult of disposal. The best white boilers are certainly not worth more than 42s. to 45s. at Mark Lane; and grey and maple may be had at prices varying from 32s. to 35s. per qr.

The reference we made in the foregoing portion

of this article to the position of the grain trade abroad, renders it scarcely necessary to enter into a further detail in this place; still, as we have not before taken much notice of prices abroad, we may as well follow our usual custom, and furnish our readers with the most recently received quotations at the different foreign ports.

The latest advices from Danzig state that really fine high-mixed wheat, the growth of 1842, was then still held at 55s. per qr. free on board; but fair qualities of new were obtainable at 48s. to 50s. The stock was rather large, amounting to nearly 700,000 qrs.; it was, however, the general opinion that, in consequence of the great scarcity prevailing in Poland, the supplies down the Vistula would be unusually small during the summer months. At the lower Baltic ports a moderate amount of business appears to have been done in wheat, partly for shipment to Belgium. At Rostock, Stettin, and neighbouring ports, good heavy red wheat might at present be bought at 48s. to 50s.; but it was the general impression at those places that the slightest increase in the demand would be immediately followed by an advance.

In the Mediterranean Polish Odessa wheat (the quality mostly received from thence) is nearly as dear as in this country; and in the United States markets flour was, according to the latest accounts, selling at 22s. to 24s. per barrel.

CURRENCY PER IMPERIAL MEASURE.

FEBRUARY 23.

WHEAT, Essex and Kent, new, red	52 58	White ..	54 63
Old, red	56 62	Do.	60 64
RYE, old	34 38	New....	58 40
BARLEY, Grinding, 28 5l Malting	31 34	Chevalier	36 —
Irish	27 28	Bere	26 27
MALT, Suffolk and Norfolk	58 63	Brown..	56 60
Kingston and Ware	60 —	Chevalier	65 —
OATS, Yorksh. & Lincolnshire, feed	22 —	Potato..	26 —
Youghall and Cork, black..	21 22	Cork, white	23 —
Dublin	23 24	Westport	24 —
Waterford, white	21 23	Black ..	21 22
Newry	25 27		
Galway	20 21		
BEANS, Tick, new	34 38	Old, small	48 50
PEAS, Grey	36 —	Maple ..	36 —
White	46 48	Boilers..	50 —
Stockton and Norfolk	40 41	Irish	44 46

FOREIGN GRAIN AND FLOUR IN BOND.

WHEAT, Dantzic	52 56	fine —	60
Hamburg	50 52		
Rostock	52 54		
BARLEY	20 23	26	
OATS, Brew	24 28	Feed ..	19 20
BEANS	44 —		
PEAS	50 —		
FLOUR, American, per bbl	30 32	Baltic ..	— —

COMPARATIVE PRICES OF GRAIN.

WEEKLY AVERAGES by the Imp. Quarter, from the Gazette, of Friday last, Feb. 20th, 1846.	s. d.	AVERAGES from the corresponding Gazette of the last year, Friday, Feb. 21st, 1845.	s. d.
WHEAT	54 0	WHEAT	45 5
BARLEY	30 6	BARLEY	53 0
OATS	21 9	OATS	21 6
RYE	32 7	RYE	30 1
BEANS	34 9	BEANS	35 8
PEAS	35 7	PEAS	35 7

IMPERIAL AVERAGES.

Week ending	Wheat.	Barley.	Oats.	Rye.	Beans.	Peas.
Jan. 10th	56 3	31 10	21 9	33 11	36 8	38 11
17th	55 2	31 11	22 3	34 9	36 9	39 3
24th	55 7	31 8	21 10	37 8	36 1	36 8
31st	54 8	31 3	21 10	32 0	35 6	35 8
Feb. 7th	54 3	30 10	21 7	34 2	35 9	35 6
14th	54 9	30 6	21 9	32 7	34 9	35 7
Aggregate average of the six weeks which regulates the duty.	55 3	31 4	21 10	34 2	35 11	36 11
Duties payable in London till Wednesday next inclusive, and at the Out-ports till the arrival of the mail of that day from London ..	17 0	7 0	6 0	8 6	7 6	6 6
Do. on grain from British possessions out of Europe ..	4 0	0 6	2 0	0 6	0 6	0 6

PRICES OF SEEDS.

FEBRUARY 23.

SEED, Rape	24l. 26s.	Irish ..	—l. —l. per last.
ditto, new	25s.	—	— per last.
Linsed, Baltic. 40 41		Odessa	45 47
Mustard, white 10 12		brown —	per bush.
Linsed Cakes, English. —11l.	10s. to 12l.	Os.	per 1000
Linsed, English, sowing 54 60		crushing 45 47	per qr
Caraway	44 46	new ..	48 50 per cwt.
Coriander	11 14	per cwt.	
Mustard, brown, new....	10 12	white..	9 11 p. bush
Hempseed	35 38	per qr.	
Trefoil	17 24	old.. —	new —
Mediter. & Odessa	44 45		
Canary, 48 49	per qr.	fine	51 53s.
Tares, Winter	7s. 9d. to 8s. 3d.		

PRICES OF HOPS.

BOROUGH, MONDAY, FEB. 23.

There has been a tolerably steady inquiry for the best pockets, and at fully previous rates, though there is not much inquiry for other sorts. The quotations are—
 Sussex New Pockets.....£8 8 to £7 5 per cwt.
 Weald of Kent ditto..... 6 5 7 7
 Mid Kent ditto..... 7 7 9 9
 East Kent ditto..... 9 9 10 10
 Mid Kent Bais..... 7 5 8 3
 East Kent ditto..... 8 0 9 9

POTATO MARKET.

SOUTHWARK, WATERSIDE, Feb. 23.

The supply to this market since this day se'night has been limited; yet, in consequence of the unprecedented mildness of the weather, the trade is very heavy, at the following prices: York Reds, 80s. to 130s.; York Regents, 80s. to 110s. (dull trade); Scotch Reds, 60s. to 80s.; Montrose Buffs and Blues, 70s.; Jersey Blues, 70s.

WOOL MARKETS.

BRITISH.

LEEDS, FEB. 20.—Sales of combing and clothing wools this week have not exceeded the quantity required by the manufacturers for immediate use. Prices are stationary.

LIVERPOOL, Feb. 21.

SCOTCH.—There still continues a moderate demand for Laid Highland Wool, and as the supply is light, prices are well supported. White Highland is still neglected. Good and well-conditioned Crossed and Cheviot Wool are in fair demand at full rates; inferior are neglected.

Laid Highland Wool, per 24lbs	...	9 3 to 9 9
White Highland do.	...	12 3 13 0
Laid Crossed do.	unwashed	11 6 12 0
Do. do.	washed	12 0 14 0
Do, Cheviot do.	unwashed	11 6 14 6
Do. do.	washed	14 0 18 0
White Do.	do.	24 0 28 0

PRICES OF SHARES.

Shares.	Div. last half year	RAILWAYS.	Price per Share.
		Aberdeen.....107 pd	
		Amber, Notingham., Boston, & Erewash Junc. 2 1/2 pd	2 1/2
24,000	2 1/2 p sh	Armagh, Coleraine, Portrush & Ballyshannon 25 1/2 pd	5,100 4 1/2 per ct
9,500	10s	Bideford and Tavistock..... 1 1/2 pd	7,968 4 1/2 per ct
10,000		Birmingham and Gloucester 100 sh pd	11,475 4 1/2 per ct
30,000		Do. New, iss. 7 1/2 dis. . . . 25 1/2 sh 17 1/2 pd	31
		Birmingham and Oxford Junction 201 sh 2 1/2 pd	
		Boston, Stamford, and Birmingham. 22 1/2 pd	4125000 5 1/2 per ct
9,500		Brighton, Lewes, & Hastings, 50 1/2 sh 20 1/2 pd	41,250 5 1/2 per ct
15,000	17 1/2 s p sh	Bristol and Exeter 109 1/2 sh 70 1/2 pd	54,450 5 1/2 per ct
		Ditto New..... 35 1/2 sh 5 1/2 pd	12
6,640	12s p sh	Bristol and Gloucester..... 50 1/2 sh 30 1/2 pd	43,000 3s
36,000		Bristol and Liverpool Junction 2 1/2 pd	
51,000		Caledonian..... 50 1/2 sh 10 1/2 pd	14 a 1 1/2
		Ditto New..... 25 1/2 sh 2 1/2 pd	3 1/2 a 2 1/2
		Do. Extension..... 25 1/2 sh 2 1/2 pd	2 a 1/2
42,000		Cheltenham and Oxford..... 2 1/2 pd	2 1/2
		Chelmsford and Bury..... 1 1/2 pd	1 1/2
		Chester and Holyhead..... 50 1/2 sh 20 1/2 pd	21 1/2 a 1/2
		Chester and Manchester..... 42s pd	
		Clydesdale Junction..... 5 1/2 pd	5 1/2
		Cork, Blackrock, & Passages 22 1/2 sh 22 1/2 pd	22 1/2
40,000		Cork and Killarney..... 50 1/2 sh 2 1/2 pd	1 a 1/2
		Cork and Waterford..... 25 1/2 sh 1 1/2 pd	1 a 1/2
		Cornwall..... 50 1/2 sh 5 1/2 pd	5 1/2
		Derby, Uttoxeter, and Stafford 2 1/2 pd	2 1/2
		Direct Manchester (Remington's) 2 1/2 sh	2 1/2
		Do. Do. (Rastrick's)..... 5 1/2 pd	5 1/2
35,000		Direct Northern..... 50 1/2 sh 2 1/2 pd	2 1/2
		Direct Norwich..... 20 1/2 sh 1 1/2 pd	1 1/2
21,600		Dublin and Armagh..... 1 1/2 pd	1 1/2
10,000		Dublin & Belfast Junction..... 50 1/2 sh 5 1/2 pd	5 1/2 a 6 1/2
12,800		Dublin, Belfast, & Coleraine, 50 1/2 sh 2 1/2 pd	2 1/2
17,000		Dublin and Galway..... 50 1/2 sh 4 1/2 pd	4 1/2 a 1/2
144,000	3s p sh	Dundalk and Enniskillen 50 1/2 sh 5 1/2 pd	5 1/2
		Eastern Counties..... 25 1/2 sh 14 1/2 pd	21 1/2 a 2
144,000		Do. New..... 25 1/2 sh 6 1/2 pd	7 pm
144,000		Do. Perpetual, No. 1. . . . 67 1/2 sh 4 1/2 pd	4 1/2 pm
		Ditto ditto No. 2. . . . 67 1/2 sh 4 1/2 pd	4 1/2 pm
4,500		Do. York Extension..... 20 1/2 sh 10s pd	1 1/2 a 8
2,000		East Dereham and Norwich..... 1 1/2 pd	1 1/2
		Eastern Union..... 50 1/2 sh 25 1/2 pd	25 1/2
		Ditto Quarter Shares..... 12 1/2 sh 3 1/2 pd	3 1/2
18,000	17 10s ps	East Lincolnshire..... 1 1/2 pd	2 1/2 a 1/2
		East and West of England..... 1 1/2 pd	1 1/2
18,000	7s 6d ps	Edinburgh & Glasgow..... 50 1/2 sh	77 1/2 a 1/2
26,000		Ditto Half Shares..... 50 1/2 sh	50 1/2
26,000		Ditto Quarter Shares..... 12 1/2 sh 10 pd	16
		Ditto New 1/4 Shares..... 12 1/2 sh 10 pd	16
10,800		Edinburgh and Northern, 25 1/2 sh 1 1/2 pd	1 1/2
		Edinburgh and Perth..... 3 1/2 pd	3 1/2
		Ely and Huntingdon..... 25 1/2 sh 5 1/2 pd	5 1/2
		Enniskillen and Sligo..... 2 1/2 pd	2 1/2
		Exeter, Yeovil, & Dorchester, 50 1/2 sh 2 1/2 pd	2 1/2
		Goole Doncast.&Sheffid., 20 1/2 sh 42s pd	1 1/2 pm
10,918	5 1/2 per ct	Grand Junction..... 100 1/2 sh pd	100 1/2
10,918	5 1/2 per ct	Ditto Half Shares..... 50 1/2 sh pd	50 1/2
8,000		Ditto Quarter Shares..... 25 1/2 sh pd	25 1/2
		Grand Union (Nottingham & Lynn) 1 1/2 pd	1 1/2
		Great Leinster & Munster 100 sh 7 1/2 pd	7 1/2
		Great Eastern and Western..... 2 1/2 pd	2 1/2
12,000		Great Grimsby & Sheffield, 50 1/2 sh 5 1/2 pd	5 1/2
20,000		Great Southern & Western (Ireland) 50 1/2 sh 15 1/2 pd	15 1/2
		Ditto Extension..... 50 1/2 sh 12 1/2 pd	12 1/2
		Great Munster..... 2 1/2 pd	2 1/2
10,000	3 1/2 p sh	Great North of England..... 100 1/2 sh pd	220 ex-d
	10s p sh	Ditto New..... 40 1/2 sh 5 1/2 pd	5 1/2
		Ditto New..... 30 1/2 sh 5 1/2 pd	5 1/2
		Great North of Scotland..... 2 1/2 pd	2 1/2
23,000	4 1/2 per ct	Great Western..... 100 1/2 sh 8 1/2 pd	154 ex-d
25,000	4 1/2 per ct	Ditto Half Shares..... 50 1/2 sh pd	85 ex-d
		Ditto Quarter Shares..... 5 1/2 pd	17 1/2 ex-d
37,500	4 1/2 per ct	Ditto Fifths..... 20 1/2 sh 20 1/2 pd	53 1/2 ex-d
		Guildford, Farnham, and Portsmouth, 50 1/2 sh 5 1/2 pd	5 a 4 1/2
20,000		Harwich..... 20 1/2 sh 1 1/2 pd	1 1/2
8,000	10 1/2 per ct	Hull and Selby..... 50 1/2 sh pd	107 a 1/2
8,000	10 1/2 per ct	Do. Quarter Shares..... 12 1/2 sh pd	12 1/2
15,000		Do. Half Shares..... 25 1/2 sh 7 1/2 pd	27
50,000		Inverness and Elgin..... 20 1/2 sh 2 1/2 pd	2 1/2
		Irish North Midland..... 1 1/2 pd	1 1/2
		Isle of Axholme..... 2 1/2 pd	2 1/2
5,000		Kendal and Windermere 25 1/2 sh 1 1/2 pd	1 1/2
16,000		Lancaster and Carlisle..... 50 1/2 sh 3 1/2 pd	57
		Do. New..... 5 1/2 sh 10 1/2 pd	10 1/2
		Leeds & Carlisle..... 2 1/2 rd	1 1/2
		Leicester and Birmingham 20 1/2 sh 2 1/2 pd	2 1/2
		Leicester and Bedford..... 20 1/2 sh 2 1/2 pd	2 1/2
		Leic., Tam., Cov., Bir., & Trnt. Vall. Junc. 20 1/2 sh 4 1/2 pd	4 1/2
		Limerick and Waterford 50 1/2 sh 7 1/2 pd	7 1/2
		Liverpool & Manchester..... 100 1/2 sh pd	100 1/2
		Ditto Half Shares..... 50 1/2 sh pd	50 1/2
		Ditto Quarter Shares..... 25 1/2 sh pd	25 1/2
		Liverpool & Leeds Direct 50 1/2 sh 7 1/2 pd	7 1/2
		Lpool., Mancl., and Newcastle Junction..... 2 1/2 pd	2 1/2
		London & Birmingham..... 2 1/2 pd	2 1/2
		Ditto Thirds..... 32 1/2 sh 16 1/2 pd	16 1/2
		Ditto Quarter Shares..... 25 1/2 sh 2 1/2 pd	2 1/2
		Ditto Fifths..... 20 1/2 sh 2 1/2 pd	2 1/2
		London and Birmingham Extension 25 1/2 sh 1 1/2 pd	1 1/2
		London & Blackwall..... Av. 16 1/2 sh 4 1/2 pd	4 1/2
		Ditto New..... 2 1/2 pd	2 1/2
		Ditto Extension..... 3 1/2 pd	3 1/2
36,000	30s p sh	London and Brighton..... 50 1/2 sh pd	67 1/2 ex-d
4,500		Ditto Consolidated Eighth 50 1/2 sh 40 1/2 pd	53 a 4 1/2
		Ditto Fifths..... 50 1/2 sh 20 1/2 pd	30 1/2
33,000	8s0d p sh	London & Croydon..... Av. 18 1/2 sh 9 1/2 pd	22 1/2 a 2
33,000		Do. Guaranteed 5 per Ct. . . . 9 1/2 sh 9 1/2 pd	10
		Lon., Chelt., Oxf., Glouc., and Hrl., 25 1/2 sh 1 1/2 pd	1 1/2
43,077		London & Greenwich..... Av. 12 1/2 sh 4 1/2 pd	10 a 1 1/2
11,136	10s	Preference or Privilege. Av. 18 1/2 sh 2 1/2 pd	2 1/2
		London, Hounslow, & Western. . . . 2 1/2 pd	2 1/2
46,200	2 1/2 ps sh	London & South West..... Av. 41 6/8 10d	78 a 1/2
		Ditto Consolidated Eighth, 40 1/2 sh 8 1/2 pd	43 a 4
		Ditto New..... 50 1/2 sh 12 1/2 pd	23 1/2
		Ditto New..... 40 1/2 sh 10 1/2 pd	10 1/2
90,000		London and York..... 50 1/2 sh 2 1/2 pd	2 1/2 a 7 1/2
		Do. 1/4 Shares..... 25 1/2 sh 2 1/2 pd	2 1/2
20,000		London and Windsor..... 25 1/2 sh 1 1/2 pd	0 8
		London, Warwick, & Kidder. 50 1/2 sh 2 1/2 pd	1 1/2 a 7 1/2
10,000		London, Salisbury, & Yeovil 50 1/2 sh 2 1/2 pd	2 1/2
		Londonderry & Coleraine, 50 1/2 sh 2 1/2 pd	2 1/2
		Londonderry & Enniskillen 50 1/2 sh 2 1/2 pd	2 1/2 a 1/2
8,000		Lynn and Ely..... 25 1/2 sh 5 1/2 pd	6 a 1/2
		Lynn and Dereham..... 25 1/2 sh 5 1/2 pd	6 a 1/2
13,000	2 1/2 1/2 s ps	Manchester & Leeds..... 100 1/2 sh 8 1/2 pd	13 1/2
13,000		Ditto Half Shares..... 50 1/2 sh 38 1/2 pd	38 1/2
13,000	2s	Ditto Quarter Shares..... 25 1/2 sh 2 1/2 pd	2 1/2
		Ditto Fifths..... 20 1/2 sh 1 1/2 pd	1 1/2 a 12
22,750		Ditto Sixteenths..... 6 1/2 sh 6 1/2 pd	9 1/2
		Do. Extension..... 4 1/2 sh 4 1/2 pd	4 1/2 pm
30,000	1 1/2 p sh	Manchester & Birning..... 40 1/2 sh 40 1/2 pd	79 a 3
30,000		Do. 1/4 Shares..... 20 1/2 sh 4 1/2 pd	4 1/2
		Do. New 1/4 Shares..... 10 1/2 sh 2 1/2 pd	9 1/2 a 10 1/2
		Do. Continuation and Welsh Junction..... 1 1/2 pd	7 1/2
		Manchester, Buxton, and Matlock, 20 1/2 sh 4 1/2 pd	4 1/2 pm
		Manchester, Bir., & Mould Junction Manchester to Southampton... 2 1/2 rd	2 1/2 r 1 1/2
4155400 3 1/2 per ct		Midland..... 20 1/2 sh 15 a 5 1/2	15 a 5 1/2
12,500		Ditto Fifths..... 20 1/2 sh 2 1/2 pd	2 1/2
		Ditto New..... 40 1/2 sh 12 1/2 pd	28 a 7 1/2
978500 46s 3d per ct		Ditto Birmingham & Derby..... Stock	118 a 20
15,000		Midland Grt. West. (Irish) 50 1/2 sh 10 1/2 pd	10 1/2
		Do. Extension to Sligo..... 2 1/2 pd	2 1/2
20,000	2 1/2 p sh	Newcastle and Carlisle..... 100 1/2 sh pd	100 1/2
		Newcastle, Durham, and Lancashire Junction..... 1 1/2 pd	1 1/2
20,000	10s 6d p sh	Newest & Darling Junc..... 25 1/2 sh 25 1/2 pd	45 a 2 1/2
		Do. New..... 25 1/2 sh 1 1/2 pd	10 1/2 a 4 1/2
10s p sh		Ditto New (Branding)..... 25 1/2 sh 20 1/2 pd	38
		Newcastle & Berwick..... 25 1/2 sh 10 1/2 pd	22 a 1
		Newport and Abergavenny..... 2 1/2 pd	2 1/2
		New Ross and Carlow..... 2 1/2 pd	2 1/2
		Newry and Enniskillen, 50 1/2 sh 2 1/2 pd	0 1/2
24,000		Newark, Sheffield, & Boston 25 1/2 sh 2 1/2 pd	2 1/2
36,000		North British..... 25 1/2 sh 20 1/2 pd	27 1/2 a 1/2
		Ditto 1/4 Shares..... 12 1/2 sh 6 1/2 pd	6 1/2
		Ditto Carlisle Extension 12 1/2 sh 1 1/2 pd	1 1/2
		Ditto Dalkeith..... 25 1/2 sh pd	25 1/2
		Do..... 5 1/2 sh pd	5 1/2
		North Devon..... 2 1/2 pd	2 1/2
10,256	17 10s	Northern & Eastern..... 50 1/2 sh 50 1/2 pd	60 1/2
3,136	22s 6d	Do. Scrip. iss. 5 dis. . . . 50 1/2 sh 40 1/2 pd	40 1/2
12,208	7s 6d	Do. 1/4 Shares..... 12 1/2 sh 10s pd	10s
		Do. New..... 1 1/2 pd	1 1/2
12,000		North Kent & Direct Dover, 50 1/2 sh 2 1/2 pd	2 1/2 a 7 1/2
19,000		North Staffordshire..... 20 1/2 sh 4 1/2 pd	4 1/2 pm
19,000		North Wales..... 25 1/2 sh 3 1/2 pd	3 1/2
		Norwich and Brandon..... 20 1/2 sh 18 1/2 pd	25 1/2 ex-d
		Ditto New..... 10 1/2 sh 3 1/2 pd	3 1/2

	Northampton, Banbury, & Chelt., 21 pd	1½ a ¾	15,000
	Oxford, Witney, & Cheltenham, 17½ pd		20,000
	Oxf., Worcester, & Wolverhampt., 12½ pd	14½ a 14	
	Oxf., Gosp., Portsm., and Southampton, 20½ sh 42s pd		126,000
	Perth and Inverness, 24½ pd	1½ a ¾	
	Pilbrow Atmospheric, 11 pd		
	Portsmouth Direct, 50½ sh 3½ pd	3½	25,000
2,630	Preston & Wyre, 25½ sh pd	34½ a 5	
	Do. ¼ Shares, 2½ pd		130,000
	Richmond, 20½ sh 10½ pd		
125,000	Ruzby and Huntingdon, 20½ sh 2½ pd	1½ a ¼	125,000
	Scottish Central, 25½ sh 7½ pd	15½ a 16	
	Do. New, 2½ pd	9	
12,000	Scottish Midland, 25½ sh 5½ pd		80,000
7,000	Sheffield and Manchester, 100½ sh pd		72,000
	Ditto ¼ Shares, 25½ sh 8½ pd		120,000
28,000	Shrewsbury & Birmingham, 50½ sh 2½ pd	3½ a ½	
	Shropshire Union, 20½ sh 22s pd	½ d.s	
	Shrewsbury & Hereford, 2½ pd		
	Sligo and Shamoon, 2½ pd		
	Somersetshire Midland, 28½ pd		40,000
22,000	South Devon, 50½ sh 35½ pd		31,000
66,000	South Eastern and Dover, Av. 33½ 2s 4d	3s a ½	84,000
28,000	Ditto New, iss. at 32½ No. 1, 50½ sh 10½ pd	18½ a 18	
42,000	Ditto New 33½ 6s 8d., No. 2, 50½ sh 10½ pd	12 a ½	
	Ditto New 30½ No. 3, 10½ pd	10½ a 11½	
136,000	Ditto New, No. 4, 50½ sh 2½ pd	¾ a ¾	70,000
	South Midland, 20½ sh 42s pd	2½ pm	
50,000	South Wales, 50½ sh 5½ pd	5½ a 6½	
7,000	Staffordshire & Shropshire, 50½ sh 2½ pd	2½	
	Staines and Richmond, 20½ sh 11½ pd		
45,000	Tea and Dove Valley, 20½ sh 1½ pd	7½	
	Trent Valley, 20½ sh 5½ pd	20½ a 6	
	Trent Valley & Holyhead Junction, 20½ sh 28½ pd	¾	
	Vale of Neath, 2½ pd	3	20,000
	Warwickshire and London, 20½ sh 14½ pd		4,000
	Waterford and Kilkenny, 20½ sh 3½ pd	2 a ½	40,000
	Waterford, Wexford, & Valentia, 1½ pd	1 a ½	60,000
	Waterford, Wexford, Wicklow, and Dublin, 1½ pd	1½ a ½	40,000
9,000	Welsh Midland, 2½ pd	2 a 1½	20,000
15,000	West Cornwall, 20½ sh 1½ pd		10,000
	West End and Southern Counties, 50½ sh 1½ pd		10,000
7,500	West London, Old Shares, 20½ sh 10½ pd		20,000
20,000	West Yorkshire, 50½ sh 2½ pd		10,000
	Wexford and Carlow, 2½ pd		60,000
	Wilts, Somerset, and Southampton, 20½ sh 1½ pd		
30,000	Wilts, Somerset, and Weymouth, 50½ sh 2½ pd	3½ a ½	
	Worcester, Shrewsbury, and Crewe Union, 1½ pd		
	Worcester & South Wales, 20½ sh 42s pd		
15,000	Yarmouth and Norwich, 20½ sh 20½ pd	27½	10s
	York and Carlisle, 2½ pd		
6,700	York & North Midland, 50½ sh pd	101	5½ per ct
6,700	Ditto Half Shares, 25½ sh pd	47½	5½ per ct
	Ditto Scarborough Branch, 25½ sh 25½ pd		
25,300	Ditto Selby, 50½ sh 30½ pd	73	
	Ditto Extension, 25½ sh 15½ pd	33 a 1½	
	Do. East and West Riding Ext., 25½ sh 1½ pd	10 a ½	

FOREIGN RAILWAYS.

75,000	Anglo-Belgian, 4½ pd	3	
	Boulogne and Amiens, 20½ sh 10½ pd	11½ a 12	
150,000	Bordeaux & Mediterranean, 20½ sh 2½ pd		
	Bordeaux and Toulouse (Mackenzie), 20½ sh 2½ pd	2½	
240,000	Bordeaux, Toulouse, & Cette, (Espaleta), 20½ sh 2½ pd	2½ a ½	
100,000	Central of Spain, 20½ sh 2½ pd	1 a ½	
	Ceylon, 5s pd		
	Demerara, 2½ pd		
	Dendre Valley, 20½ sh 2½ pd	0½	
	Dijon and Mulhouse, 20½ sh 2½ pd		
	Dutch Rhenish, 20½ sh 5½ pd	6½ a 7	
300,000	East Indian, 5s pd	1 a ½	
	Great North. of France, (Constituted), 20½ sh 5½ pd	15½ a ¾	
	Great Paris and Lyons, 20½ sh 2½ pd		
	Great Western Bengal, 5s pd		
60,000	Great Western Canada, 22½ sh 3½ pd	2½	
	Italian and Austrian, 3½ pd		
20,000	Jamaica & South Midland Junc., 20½ sh 1½ pd	3½	

	Jamaica North Midland, 20½ sh 1½ pd		
	Do. Extension, 20½ sh 1½ pd		
	Jersey, 1½ pd		
	Louvaine and Jemeppe, 20½ sh 4½ pd		
	Lyons and Avignon, 20½ sh 2½ pd		
	Luxembourg, 20½ sh 4½ pd		
	Namur and Liege, 20½ sh 4½ pd		
	North Jamaica, 20½ sh 2½ pd		
	Orleans and Vierzon, 20½ sh 10½ pd		
	Orleans and Bourdeaux, 20½ sh 5½ pd		
	Over Yssel, 20½ 16s 8dsh 4½ pd		
	Paris and Lyons (Laffite), 20½ sh 2½ pd		
	Paris & Lyons (Ganneron's), 20½ sh 3½ pd		
	Paris and Lyons (Calon's), 20½ sh 2½ pd		
	Paris and Orleans, 20½ sh 2½ pd		
	Paris and Rouen, 20½ sh 20½ pd		
	Paris and Strasbourg (Ganneron's), 20½ sh 2½ pd		
	Do. Do. (Compe de L'Est), 2½ pd		
	Do. Do. (Aymard's), 2½ pd		
	Paris and St. Quentin, 20½ sh 2½ pd		
	Rouen and Havre, 20½ sh 20½ pd		
	Sambre and Meuse, 20½ sh 6½ pd		
	Strasbourg and Bale, 14½ sh pd		
	St. Laurence and Atlantic, 4½ pd		
	Tourney, Juribise, Landen & Hasselt, 20½ sh 4½ pd		
	Tours & Nantes (Mackenzie), 20½ sh 4½ pd		
	Ditto Ditto (Lefebvres), 20½ sh 2½ pd		
	West Flanders, 20½ sh 4½ pd		

JOINT STOCK BANKS.

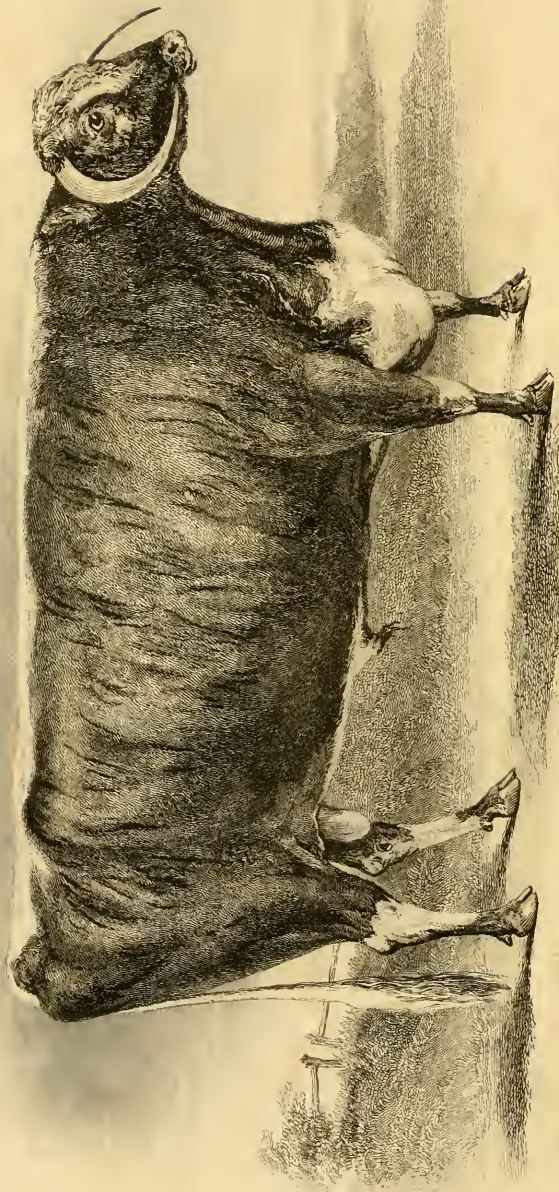
22,500	6½ per ct	Australasia, 40½ sh pd	26½
20,000	5½ per ct	British North American, 50½ sh pd	
5,000	6½ per ct	Ceylon, 25½ sh pd	
	5½ per ct	Commercial of London, 100½ sh 20½ pd	
	5½ per ct	Colonial, 100½ sh 25½ pd	
	6½ per ct	Ionian, 25½ sh 1½ pd	
	6½ per ct	London and Westm., 100½ sh 20½ pd	
	6½ per ct	London Joint Stock, 50½ sh 10½ pd	
	8½ per ct	Provincial of Ireland, 100½ sh 25½ pd	40½ a 50
	8½ per ct	Ditto New, 10½ sh pd	
	5½ per ct	National of Ireland, 50½ sh 20½ pd	
	5½ per ct	National Provincial of England, 100½ sh 35½ pd	35½
	5½ per ct	Ditto New, 20½ sh 10½ pd	
	6½ per ct	Union of Australia, 25½ sh pd	
		Do. Do., 2½ pd	
	5½ per ct	Union of London, 50½ sh 10½ pd	

MINES.

4,000	1½	Alten, 15½ sh 14½ pd	
10,000		Anglo Mexican, iss. 5½ p. 100 sh pd	
15,000		Ditto Subscription, 25½ pd	
2,000		Bolanos Scrip, 20½ sh 10½ pd	
20,000		British Iron, 20½ sh 20½ pd	
10,000	10s	Brazilian Imp. iss. 5½ p. 35½ sh 1½ pd	
6,000		Do. Mocaba & Coeas, 20½ sh 25½ pd	
11,000	1½ 5s	Do. St. John Del Rey, 20½ sh 15½ pd	
12,000		Cobre Copper, 40½ sh pd	23
10,000		Columbian iss. 5½ pm, 55½ sh pd	
1,500		Ditto New, 11½ sh pd	
15,000		Galvanized Iron, 100½ sh pd	
5,000		Ditto New, 10½ sh 7½ pd	
20,000		General Mining, 20½ sh pd	
5,051	7s 6d	Mexican, 60½ sh 50½ pd	
20,000	10½ p sh	Mining Comp. of Ireland, 25½ sh 7½ pd	
11,500		Real del Monte, Unregistered Av., 50½ sh pd	
10,000		Rhymney Iron, 50½ sh pd	
7,000		Santiago de Cuba, 25½ sh 10½ pd	
43,174		United Mexican, average 28½ 2s 8½ pd	

MISCELLANEOUS.

10,000	1½ 4s	Australian Agricult., 100½ sh 30½ pd	
		Anglo Mexican Mint, 10½ sh pd	
10,000	6½ per ct	Canada, 100½ sh 32½ pd	
10,000	5½ per ct	Upper Canada Bonds, 100½ sh pd	
10,000	5½ per ct	Comp. Copper Miners in England, 100½ sh 50-20½ pd	
5,000	5½ per ct	General Rev. & Invest., 100½ sh pd	
		& cbs. 2½	
2,700	4½ per ct	Equit. Reversionary, 100½ sh 85½ pd	80½
20,000	1½ 8s and 2s 6d bs	Gen. Steam Navigat., 15½ sh 1½ pd	
		7s per ct	
		Peninsular & Orient Steam, 50½ sh 15½ pd	
		Ditto, 50½ sh 1½ pd	26
	1½ 10s	Reversionary Int. Soc., 100½ sh pd	99 ex d.
14,000	6½ per ct	Royal Mail Steam, 60½ pd	57½
4,000		South Australian, 25½ sh 20½ pd	



Mr. Long's Favourite Bull

Whose name is Mr. Long's Favourite Bull, was born in the year 1810, and was the property of Mr. Long, of the County of Devon, England, and was the first of the breed that was ever bred in the County of Devon, England, and was the first of the breed that was ever bred in the County of Devon, England.



Anchor

1841

Davis

A Fair Stallion
Contributed by the very E. P. of Brighton Hall, Suffolk, for which the "Red Bull" of Devon awarded
at the Meeting of the B. A. C. of Great Brunswick, July 1841.

THE FARMER'S MAGAZINE.

APRIL, 1846.

No. 4.—VOL. XIII.]

[SECOND SERIES.

PLATE I.

PURE LEICESTER OR LONG-HORNED BULL.

Our first embellishment represents a pure Leicester or Long-Horned Bull, four years and four months old, bred by Mr. Slingsby, of Foleshill, near Coventry. The animal was exhibited at the country Meeting of the Royal Agricultural Society, held at Shrewsbury, in July last, and obtained a prize of Twenty Sovereigns, awarded to the Hon. M. W. B. Nugent, of Higham Grange, near Hinckley, Leicestershire.

PLATE II.

SUFFOLK CART STALLION,

THE PROPERTY OF W. FISHER HOBBS, ESQ.

Briton, aged nine years, a Suffolk Cart Stallion, the winner of the first prize of Thirty Sovereigns, at the Shrewsbury Meeting of the Royal Agricultural Society, 1845; exhibited at the meeting by Mr. H. Crosse, of Finborough, near Stowmarket, Suffolk, and purchased at the sale by W. Fisher Hobbs, Esq., of Marks Hall, Kelvedon, Essex; who is the present owner of him. Briton also won the following prizes at local societies:—West Suffolk, 1838, first prize; West Suffolk, 1841, second prize; Central Suffolk, 1841, first prize; West Suffolk, 1842, first prize; Central Suffolk, 1842, second prize; West Suffolk, 1843, first prize; Central Suffolk, 1843, first prize; West Suffolk, 1844, first prize; Central Suffolk, 1844, first prize; West Suffolk, 1845, first prize—amounting to £66.

Briton was bred by the late Mr. William Crosse, of Little Finborough Hill; sire Mr. W. Crosse's horse of One House Hall; grandam Mr. Howlett's Old Briton. Dam bred by Mr. W. Crosse, by Mr. Shepherd's horse, late of Boyton Hall; grandam by the late Mr. Groom's horse by Mr. Edward's noted horse Old Sampson.

ON THE IMPROVEMENT OF PERMANENT PASTURES.

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

The improvement of pastures (an operation attended with some practical difficulties) has certainly been ever slow and inconsiderable. "Grasses," says Paley, "are nature's care;" and in too many instances the farmer seems to deem it best to leave his grass-lands in her hands, without attempting to aid her in her operations. It may not be, how-

ever, unattended with advantage to recall to our attention the most modern successful efforts to improve the pasturage lands of England. There is, of course, the first operation to be regarded: it is idle for us to attempt any improvement, where crops of rushes indicate the presence of standing water. The good effects of deep drainage, how-

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ever, are much too rarely attended to in the case of pastures. The water being removed, there are then two courses to be profitably followed by the farmer to increase the produce of his grass-lands, either of which, or both, he may adopt to the permanent increase of their produce, viz.—by using the chemical or the mechanical agents which he possesses.

Let us briefly examine these; and first with regard to their chemical treatment. It has been long determined by many important experiments, at some of which I have personally assisted, that by the application of certain manures as top-dressings to pastures, a rapid change takes place in the variety, and the produce of the grasses with which they are tenanted. Thus gypsum (sulphate of lime), when I applied it at the rate of three cwts. per acre, to some pasture land in the neighbourhood of Hungerford, was found so to encourage the growth of white clover, that the old coarse herbage gradually disappeared; and when I repeated this experiment on some grass land on the Craig formation, near Ipswich, and on other grass land on the chalk formation, near Winchester, the same result followed, the old herbage disappeared, and a far better and more luxuriant variety of the grasses made their appearance.

Many of my own long continued experiments with the sulphate of lime, were made with it as it exists in the peat ashes, or ashes from coals, in which it constitutes the only fertilizing ingredient. Of this fact, I had in the summer of 1843 a remarkable confirmatory instance in an experiment which I made on the grass in the park of a relation of mine, situated in the valley of the Kennett, in Berkshire. I was led to try the effect of gypsum on a patch of this grass, from being told that "farm-yard manure is no good to the park, but the peat ashes produce an excellent effect." The quantity which I applied was only two cwt. per acre, and the time of year (July), was perhaps the worst that could have been chosen—the season dry, the hay crop only just carted off the ground; and yet, in spite of these disadvantages, the effect of the gypsum was excellent, and I was told in the following November, that "the deep green of the gypsumed grass appears like a pocket-handkerchief in the middle of the park; and the amount of the produce is very greatly superior to any of the adjacent portions not thus treated." The gypsum employed in this experiment was finely powdered, and spread by hand, as evenly as possible over the grass, and, from the long continued drought, remained for a considerable time totally unmixed with, and on the surface of the soil.

But gypsum is not the only salt of lime whose application as a top-dressing to pastures, influences

so materially the growth of these grasses. Phosphate of lime, as it exists in crushed bones, has been found to produce the same, or even greater results than the application of gypsum. I have on several occasions remarked this, and last year, in some experiments on the London Basin clay, at Lee, in Kent, after dressing a long neglected grass plot, abounding in coarse herbage, with a proportion of the urate of the London Manure Company (a very powerful and excellent manure, abounding in the phosphate of lime), I have found the same result. The white clover and other young grasses are now (March) appearing in great profusion.

The effect of bone-dust in inducing the growth of white clover, seems to be one produced on most soils. On the sandy soils of Nottinghamshire, his grace the Duke of Portland (letter to the author, dated Feb. 22, 1836) remarked, "In my early use of crushed bones, and for many years afterwards, they appeared so much to encourage the growth of white clover that I almost formed the opinion that it was superfluous to sow the seed." "Of this tendency," his grace adds in another letter, "the most remarkable instances have repeatedly been seen on very poor land, and none more so than one which occurred on a very poor piece of land, prepared for a timber plantation, by a crop of turnips, manured for with 40 bushels of crushed bones per acre, for on which, between the trees, a great deal of clover has spontaneously sprung up. Previously to this land being broken up for turnips, scarcely a plant of clover was to be seen." It is hardly necessary to remind the intelligent farmer that the chief fertilizing ingredient in bones is the phosphate of lime.

There is yet another way of applying the phosphate of lime, in combination with other fertilizing matters, to grass—that by the food of animals, which produces similar results. It is a fact well known to the farmers of the east of England that if sheep, feeding on pastures, are regularly supplied for a year or two with a portion of oilcake, not only is the *quantity*, but the *quality*, of the herbage is also very materially altered for the better. A recent report of a Suffolk farmer proves this very clearly. Now, it is found that about one-half of the ashes of linseedcake is composed of phosphate of lime. Professor Johnstone found in 100 parts of the ashes of two varieties of linseed cake (*Trans. High. Soc.*, 1845, p. 203)—

	English.	American.
Alkaline salts . . .	31.35	38.20
Phosphates of lime, and magnesia ..	47.67	56.26
Lime	4.88	1.24
Magnesia.....	1.51	....
Silica	10.81	4.04
Sand	3.86	....

The mode in which these salts of lime operate in promoting the vegetation of the seeds of the grasses resting torpid in the soil, is pretty certainly by supplying them with an ingredient essential to their vigorous growth.

“It has been generally supposed,” remarked Sir H. Davy, “that these materials act in the vegetable economy, in the same manner as condiments or stimulants in the animal economy; and that they render the common food more nutritive. It seems, however, a much more probable idea that they are actually a part of the true food of plants, and that they supply that kind of matter to the vegetable fibre, which is analogous to the bony matter in animal structures. Thus, those plants which are most benefited by the application of gypsum are those which always afford it on analysis. Clover and most of the artificial grasses contain it, but it exists in very minute quantity only in barley, wheat, and turnips” (*Ag. Chem.*, p. 19). And it is noticeable, that most of these remarks apply to the phosphate of lime of the farmers' corn crops (which can hardly be regarded as a stimulant, since it is not even soluble in water). It is also worthy of observation that the same salts of lime (the phosphate and the carbonate) which Davy thus supposes to be placed in plants to add to their strength and solidity, are precisely those salts which, for that very purpose, are placed in the bones of animals. Thus they, as it were, mutually nourish and support each other: the very phosphate of lime which, from the dissolving bone-dust, is absorbed and assimilated by the plant, again, when employed as the food of animals, is the chief material for the formation of other bones.

There appears, as I have elsewhere remarked, to be on many grass soils some care requisite to ensure the greatest advantage from the application of the bones. This fact is strongly alluded to in the following extract from a letter of Mr. William Lewis, of Trentham, in Staffordshire, transmitted to me in an obliging communication of his Grace the Duke of Sutherland:—

“I have never,” says this intelligent farmer, “applied less than one ton of crushed bones per acre for turnips drilled in, and have been generally successful in growing that crop; and their good effects (I mean the bones) are most conspicuously shown and felt on the grass crop that follows the turnips, showing to an inch how far the ground has been manured with them. I have no genuine fertile land, being nearly all of a light, dry, sandy, hungry nature; but I have now excellent pastures for sheep, which I greatly ascribe to the use of bones; for the pastures following barley, which have been manured with dung, I find very inferior to that manured with bones (the difference in the

barley crop not being perceivable); so much so, that I am upon the eve of breaking up some of my pasture fields which have lain three years, and were intended for permanent pasture; for those manured at the same time with bones are still looking beautiful, with a close, fine, even bottom. I have also applied bones to pastures, and they have generally improved the herbage and verdure very greatly. The top-dressing with the bones I would recommend to be done in moist weather, when the ground is pretty well covered with grass. I consider from one-and-a-half to two tons per acre to be a fair dressing. After sowing them, the ground should be *well brushed, harrowed length and breadthways, then heavily rolled*, and all stock taken from the field for at least ten days. I have seen bones applied to bare pastures, with little or no covering, done in *hot, dry weather*, showing no beneficial effects whatever afterwards.”

That the bones, and in fact all decomposing organic manures, are best applied *beneath* the roots of plants, is very well established, and I cannot but regret that no instrument has yet been produced which shall combine the sub-turf plough with a manure-drill, so as to enable the cultivator to unite the two great and advantageous operations of loosening the soil and at the same time depositing the fertilizer completely beneath the roots of the grasses which constitute the turf. That this is by far the best mode is evident, from not only the observations of Mr. Lewis and others, but from my own experiments; and I do hope that some of our great implement-makers will speedily furnish the farmer with a simple implement of this kind. The object appeared to me so very desirable, that until I had asked the question of my friend Mr. Robert Ransome, of Ipswich, I could not but feel convinced that some such implement must be already in existence; but he tells me in a recent obliging communication—“I know of no plough, or drill, or combination of both, that will effect the object described in thy note of the 16th, but it strikes me, that a plough with a manure dropper might be made to effect it, by lifting a breadth of turf and dropping or trailing sifted dry manure after it.”

This leads me to the second division of my paper, the mechanical agents in the possession of the farmer for the improvement of his pastures, intending by this phrase to include those operations which are chiefly directed to the loosening of the soil. That loosening the turf, as by the sub-turf plough, is productive of the best results on many soils, is very certain. The very chemistry of the operation (promoting the access of the atmospheric gases and aqueous vapours to the roots of the grasses) tells us it must be so. Sir Edmund Stra-

cey thus describes the operation of this plough (*Journ. of Roy. Eng. Ag. Soc.*, vol. 1, p. 253):—"It is used to loosen the turf about ten inches and a-half deep below the surface, without turning over the flag, loosening the soil underneath; consequently, admitting the air and the rain, and permitting the roots of the herbage to spread in search of food. There are no marks left by which it can be known that the land has been ploughed, except from the straight lines of the coulter, at the distance of fourteen inches one from the other. In about three months from the time of ploughing these lines are totally obliterated, and the quantity of aftermath, and the thickness of the bottom, have been the subject of admiration for all my neighbours."

The object, therefore, to which I have thus briefly alluded, is not only one of the highest interest to the farmer, but it is one of those practical efforts which, in some form or other, varying the manure and adapting the implement employed according to circumstances, which can hardly fail to be productive, on almost all grass-lands, of profitable results. It is an operation, too, very easily tried; for in most experimental trials of this kind, only small plots of grass-land may be, for the sake of the acquisition of knowledge, employed in the first instance, and in them the fork may be substituted for the plough, so that knowledge of the highest importance may be gained—a variety of manures tried—with facility and economy.

RADICAL EXCRETION OF PLANTS.

It seems desirable at this particular time to revive the consideration of a theory which has formed the subject of much controversy during the several years that have elapsed since it was broached by the philosopher of Geneva, De Candolle.

At the period of its first announcement this theory was hailed as the interpreter of the agency of a due *rotation* of crops. Macaire's chemical experiments tended to add probability to the conjecture; but, like all other attempts to elucidate the phenomena of vegetable life by operating upon mutilated or disturbed plants, the experiments embraced only a one-sided view of the subject, which was anything but convincing and satisfactory.

A variety of trials have subsequently been made, which being adverse, or at least negative in their results, have thrown discredit upon the hypothesis, and shaken its position in the science of agriculture.

Why then revive the recollection of a fiction? The answer shall be given in few words. First, then, there are facts incontrovertible, natural facts, independent of all that is artificial or analytical, which prove to demonstration that plants *do* excrete by their roots, and some of these shall soon be adduced. Again, a paper, or Prize Essay, from the able pen of Mr. Gyde, of Painswick, has just been published in the Transactions of the Highland Society, so precise, so argumentative, that it ought to be made public. Our limits will not permit of any thing like a full notice of it; but it may be possible to quote a few short passages, and to offer remarks upon them to an extent that shall raise curiosity, and induce many to read and ponder over the original, which otherwise might not meet their eye.

We are too apt either to disregard the authority

of a writer, or to attach blind credence to his opinions. Mr. Gyde, on the contrary, with the utmost candour lays before the reader the conflicting opinions of De Candolle, Macaire, Braconnot, de Mirbel, &c., and then observes—"It becomes a matter of importance that the subject be fully and fairly investigated, and that the true functions of the roots of plants be clearly defined." Adding—"Impressed with this idea, the author in the year 1842 first commenced the investigation of this interesting subject, and his experiments have been continued to the present time." He then, systematically and in order, proceeds to submit to the Highland and Agricultural Society the experiments, and their results, which he undertook and obtained.

The leading points of inquiry were—1. Whether plants do, or do not, excrete by their roots? 2. If they do, is the matter so excreted organic or inorganic? 3. Is the excreted matter peculiar and specific to each class; and what is its quality? 4. Does it correspond with the *sap* of the plant, or differ from it? 5. By what physiological action do plants so secrete? 6. Have plants the power to secrete noxious matters previously absorbed? 7. Will seeds germinate and continue to grow if steeped in noxious fluid, and sown in poisoned soil? 8. Why do plants refuse to grow on some soils, while they grow freely on others?

These questions are not literal quotations, except the last; they are true, however, to the spirit of inquiries which indicate a mind capable of great perception, and patient assiduity; and the method of solving them, adopted by Mr. Gyde, was in exact conformity with the caution which had been urged and re-urged by me for nearly twenty years,

and sanctioned by the late Mr. Knight, namely, that to operate upon mutilations, or on plants disturbed by removing the roots from the soil, led to difficulty and uncertain results. He therefore grew the plants which were the subjects of experiment—wheat, barley, oats, rye, beans, peas, vetches, kidney beans, cabbage, mustard, and turnips—in the following manner:—

“1st.—In garden soil in pots, and plunged in the earth.

“2nd.—In pots filled with silicious sand, watered with weak liquid manure from the dung-hill draining, diluted, but not used till quite clear.

“3rd.—In pots with silicious sand, that had been repeatedly washed with boiling water.

“4th.—In pots filled with damp moss”(query—*hyppnum*, or *sphagnum*?).

“5th.—In pots with coarsely powdered charcoal.”

The first series of experiments do not coincide with the opinion so often expressed, namely, “that plants removed from the natural bed wherein they have grown are not in a situation to afford strictly natural results.” Still it is just to Mr. Gyde to avow that in the two entire pages (278-9), occupied by three distinct tabular arrangements, it is clearly shown that both *odour* and *colouring matter* of various tints were transferred to clear water, from the roots of 11 or 12 species—the former in fewer instances; but the latter in most, though generally after the fluid had been evaporated to dryness.

This admission is made with greater readiness, though contrary to theory, because by the *second* series it is shown that the products therein obtained corresponded with those of the former series. Mr. Gyde shall speak for himself. Thus (p. 281):—

“In order to ascertain if the soil in which plants had grown contained any portion of excretion, the following experiment was tried:—Sand, which had been well washed with boiling water, was planted with young beans and peas; these plants were supplied with distilled water, and placed under the most favourable circumstances for healthy vegetation. After they had grown in the sand three weeks they were removed, and the sand washed with distilled water filtered, and, on evaporation, it (the liquid) yielded a portion of both organic and inorganic matter, in every respect of a similar character to that obtained by the immersion of the roots in water. Plants of the same kinds as those used in the former experiments were cut from their stems, the lower extremities of which were plunged in distilled water, so that the descending sap, which it was presumed would escape, might be examined and compared with the radical excretions from the same kinds of plants; and it was found that in each instance similar results were obtained on evaporation

of the water in which the cut plants had been immersed, as those from the water in which the roots of similar plants had excreted. Hence we may conclude that the matter obtained from the roots of plants by radical excretion is similar to the sap of the plant from which it was excreted.”

It is very gratifying to notice the able and comprehensive methods adopted by Mr. Gyde to determine the great fact of radical excretion, and the natural results to which it leads. His experiments are able, and to a very great extent conclusive. This will be soon shown; but, in the mean time, I distinctly assert that, without having entered upon any direct experiments similar to those of Mr. Gyde, I have, by observing nature alone in her great laboratory—the cultivated land—traced certain signs and proofs which could not be mistaken, that excretion or radical deposition does exist, particularly in the *brassica* and leguminous families. No one, who has this definite object before him, can possibly mistake the specific odour abundantly diffused through soil where peas, beans, kidney-beans, broccoli, &c., are raised; take, for instance, a box or frame of peas sowed with a view of transplantation for an early crop—on raising the plants, or turning them out, a powerful effluvia evolves, and establishes the main fact; and so in numerous cases. *Aroma is matter*; and if it pervade a soil; some effects must follow. The question is, whether the theory of De Candolle is borne out or not? I once was of opinion that rotation might be greatly involved in it; but so many circumstances tend to embarrass the phenomenon, that I am inclined to believe that a future crop is no otherwise benefited or injured by the exudation of a previous one, than as it is or may be influenced by the addition of so much fresh organic matter thus supplied to it. And with the admission I conclude this article, by stating on the authority of Mr. Gyde, that a crop of wheat during 12 consecutive years was grown on land “dug in 1832, and burned, since which time it has received an occasional light dressing of manure, the stubble being generally burned, and the ashes strewed on the land.”

The average yield from the acre is 32 bushels; and the innocuous effect, as refers to wheat excretion, thus appears to be proved.

The inferences Mr. Gyde arrives at, from all his experiments and observations, are chiefly the following:—

“1st. That the commonly cultivated plants of the natural orders of grasses, legumes, and cruciforms, excrete by their roots.

“2nd. That the excretions consist of both organic and inorganic matters.”

“13th. That plants are not injured by their excre-

tion being re-absorbed into their structure, as was supposed by M. de Candolle."

14th. Finally. "That the necessity for a rotation of crops arises from the soil in most instances being unable to supply those earthy and saline constituents required by plants."

It would be needless to cite the other intermediate positions. The object of this notice is to extend the knowledge of a most able undertaking, and it would be unjust to borrow more of an original paper than is required to show its importance.

March 11.

J. TOWERS.

GERMAN PAMPHLETS ON THE POTATO DISEASE AND ITS REMEDIES.

At this time all that relates to the potato disease has so much interest, that we have thought it desirable to lay before our readers the following abstracts of some papers on the subject, which have been extensively circulated in Germany.

No. I. *On a New Potato Scoop, with directions for using it* (a paper circulated through Prussia by the minister of the interior, with the instrument to which it refers).—Since circumstances more than ever demand that economy be employed in the use of the seed potatoes, so does it seem the most appropriate time to be reminded of a kind of culture which, although not new, is not yet universally known, and by which potato planting is effected with slight loss in the mass of potatoes. It is well known that every potato in a depression on the surface, called an "eye," contains a germ which is capable of developing a perfect potato plant. On a knowledge of this fact is founded the practice of growing the plant from cut potatoes, or from thick portions of the bark or peel of the tuber. In both these cases the germ is easily injured, and the consequence is that twice or three times more tubers are employed than are really required. Already has it been proposed to use for this purpose a spoon or scoop, but nothing has been thought of adapted for general use. An experienced farmer has, however, invented a scoop, by the use of which a larger amount of produce is secured, and varieties of potatoes which yield tubers of only small circumference, have by its use been made to give tubers of a large size.

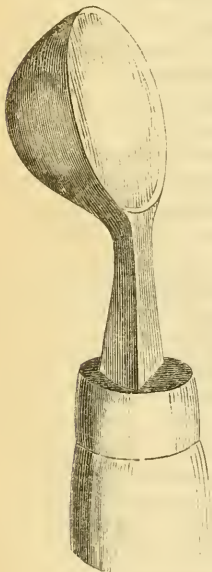
In order that the scoop may be successfully used, those potatoes should be employed which are perfectly developed, and care should be taken that the mass of flesh of the tuber taken out with it should be

so large as entirely to surround the germ, and to contain the root of the germ uninjured. This instrument consists of a round scoop or spoon, made of steel, furnished with a sharp cutting edge; the diameter of the circle which the edge forms is an inch; the greatest depth of the scoop, which has the form of half a hollow globe, when measured from the centre of the diameter of the edge to the middle point of the cavity, is $4\frac{1}{2}$ to 5 lines. The scoop has a short steel shaft, by which it is inserted into a wooden handle. When the scoop is used, the germ to be taken out should occupy the middle of the scoop, and the surrounding flesh should entirely fill the cavity. With a little use this instrument can be employed with ease and speed. When used on large potatoes, six or eight eyes may be taken out, and the rest of the potato used for other purposes.

The germs thus procured are placed about two inches deep in the earth, with the flesh of the potato below, and the eye or germ above. The distance of the plants should be that which is ordinarily adopted. The land on which the eyes are planted should be good, and the springing up of the plant watched, and the hoe be employed, for the riddance of weeds, &c.

The eyes which have been taken out may be permitted to dry for some days; but they should not be entirely dried before they are planted. When not planted immediately they should be thinly spread on something, as when they are laid in a heap together they become heated, ferment, and are destroyed. The scoop may also be employed, for the purpose of transporting seed from one district to another, at a diminished cost for carriage, on account of the bulk being much less than whole potatoes. When this is done the scooped eyes should be carefully packed in moss, speedily conveyed, and planted in the soil as fresh as possible.

Where small landowners prefer planting whole potatoes, the produce may be much increased by attention to a few circumstances. The ground should be well dug and worked, and then the potatoes may be planted deep—as deep, in fact, as the ground will permit; the plants should be placed at a distance



of 2 to 3 feet from each other, and the earth not thrown up in rows around them, but in heaps for each plant. Ground is thus economised, and the roots have free space to spread in, and their produce is always greater. When rich manure is employed, great care should be taken to mix it well with the soil; but let it never be forgotten that potatoes may be over-manured, and the vegetation thus stimulated, without the tubers being increased in number or size. If there be only a poor soil and weak manure, let the manure be placed under each plant-heap, and cover it with some earth, so that the plant-heap may not rest immediately on the manure.

No. II. *Authentic Facts on the Renovation of the Potato by means of Seed, in relation to the disease of that plant now prevalent*; by W. Albert. With remarks by the Justiz-rath Isensee; Magdeburg, 1845.—This pamphlet is introduced by some remarks from Mr. Isensee, who states that he is not himself a practical agriculturist, but one who takes great interest in all that relates to agriculture. He is the president of the Agricultural Society of Cöthen, in which position he has not only great opportunities of observing the different branches of agriculture, but also is able to make comparative experiments. Having become acquainted with the fact that one of the Saxon agriculturists had made experiments on obtaining potatoes from seed, and that even in the first year useful tubers for food and other purposes had been obtained, he turned his attention to the subject, and thus collected a variety of important details, which are recorded in the pages of the pamphlet before us. It ought to be added that the season in which the experiments were tried was not favourable; the spring was cold and wet, and the frosts in the beginning of September did much injury.

During the last 10 years it has been observed that the potato has exhibited a marked change in the vital powers. For—

1. Their preservation is more difficult now than formerly: 400 or 500 bushels of the tubers might be laid together, and no bad results ensued; but recently 60 or 70 bushels laid together will speedily decay.

2. Formerly potatoes, when wounded in digging them up, healed; but now they either putrify or become tainted.

3. It is well known, moreover, that in many places they cut off the ends of the potatoes, where the buds are mostly found, and planted them as sets. Now, however, these ends most speedily run to decay.

4. Damp fields, that used to yield sound and beautiful potatoes, give now a crop of far less durability.

5. Varieties of potatoes, that formerly blossomed

and bore fruit, perform these functions no longer the blossoms drop off, and no seed can be obtained. All these points have been more or less observed in many places.

In 1839, however, a disease appeared, which, within a short time, destroyed thousands of bushels of potatoes. This was the dry gangrene (kartoffelfäule), which speedily changed the tubers into a brown dry powder, and rendered them unfit for any kind of use. The author discovered that this disease was caused by insects, especially small mites, resembling those in cheese. Many persons smiled at this discovery, and supposed that the insects were produced by the disease in the potato. The following things, however, ought to have some weight with such opponents:—

1. Such an explanation would favour the doctrine of equivocal generation, which the celebrated naturalist Ehrenberg, of Berlin, has contradicted.

2. The author has found in the midst of sound potatoes nests of small white mites, and in the centre of an apparently sound Gibraltar potato a small living fly.

The author tried every means in his power to get rid of this disease, but failed; he at last, however, succeeded, by procuring seed potatoes from a district where the disease had not been known. At the same time were constantly found individual potatoes which entered into a state of decomposition, by which their whole organization was quickly destroyed. Besides, also, the scurf (schorfigwerden), or, so called, pock-mark (pockenkrankheit), made its appearance. This disease, for the most part, exerted no influence upon the produce, nor upon the firmness or germinating power of the potato; only, in the sale, it prejudiced them on account of their unseemly appearance. The scurf, for the most part, made its appearance where the land had been strongly manured, or mixed with marl, chalk, or soap-ashes.

This year a disease has attacked the potato in Belgium, Holland, the Rhine region, and other places, which has destroyed their organization, and rendered them unfit for the food even of brutes. This disease has been accurately investigated in the countries where it has broken out. The French and English governments have both appointed commissioners. By some the disease has been attributed to the attacks of a fungus, which, fastening itself on the under surface of the leaf, prevents that organ from performing its proper functions, and the whole plant becomes diseased. In this district (Lower Saxony) the potatoes have this year (1845) exhibited a greater tendency than usual to run into a fluid decomposition. This is especially the case with potatoes in damp soils, and those which were placed under the water during the

spring. Here and there specimens have been found which in all respects correspond with the above-mentioned disease.

What then is the origin of this disease? Numerous hypotheses are advanced in the various journals. To us it appears that it must have arisen out of the following causes:—

1. Peculiar atmospheric influences.
2. A continual propagation by tubers.

As a proof of the last cause acting before all others is the fact that the later varieties of potatoes will not produce flowers and seeds. Unquestionably it is the legitimate function of a plant to bear seeds. The seed is the crowning result of the life of a plant; to it is committed the propagation and increase of the species; and when it fails to be produced, it indicates a want of power both in the vegetable and animal kingdom. Further, it is a fact that the early varieties of potatoes which generally blossom and bear seed have been affected to a much less extent with the prevailing disease than those varieties which are older, and which bear no flowers nor fruit. A brother of the reporter planted a field this year with the following varieties of potatoes:—

- a. Gibraltar potatoes.
- b. Sugar potatoes.
- c. Leipsic potatoes, with red eyes.
- d. Potatoes planted from seed.
- e. Wax potatoes (wacks-kartoffel).

At the harvesting, which occurred on the 20th of October, 1845, the potatoes *a*, *b*, and *c* were found to contain more or less indications of disease, whilst the wax potatoes and those grown from seed were not touched at all. My brother also received from an agricultural society four potatoes of a new sort, which were planted in a garden amongst other varieties. At the time of gathering, all the other potatoes afforded traces of the scurf, and exhibited suspicious-looking spots upon the skin, whilst the produce of the four new potatoes were entirely clean and free from disease. The produce of the four potatoes was 40lbs.

It ought, however, to be observed that it has always been found that some sorts of potatoes are more liable than others to be diseased, although placed under the same circumstances; thus, in the district of the reporter, the red varieties of potatoes have been much better preserved than the white. The first possess always more consistence, and contain a much less quantity of water than the last.

From these observations it appears to result that the changes which the potatoes exhibit in disease are produced by the soluble substances which they contain, and that the disposition thereto is produced by a weak cohesion of the elementary

matters of which the potato is composed. This asthenic state of the potato gives many insects their nourishment in its tissues, and by this means the decomposition of the tuber is more readily effected. Even in the fluid forms of putrefaction, the reporter has discovered such insects; and at the moment of writing, a potato is lying before him, which, on being inspected with the microscope, exhibits countless insects, the most of which resemble in appearance the cheese-mite.

For four years the Oberamtmann Albert has occupied himself with endeavouring to restore the vitality of the potato by propagation from seeds. He has also induced others to try the experiment, which has indeed afforded some brilliant results. Especially have the following points been determined:—

1. By proper culture, potatoes grown from seed in the first year gave large, perfectly ripe, and eatable tubers; so that from a Magdeburg acre (morgen) above four Berlin wispel (a wispel is 24 bushels) were harvested. The seed mixed with dry earth was thinly sown in the middle of April, in rows a foot apart, in good garden ground. The seedlings were transplanted in a field at the end of May or the beginning of June. This should be done when they are 4 or 5 inches high. It is also necessary that each plant should have at least 3 square feet to grow in, as they develop a much larger root-system than those which are grown from tubers. It has generally been supposed that it required three years to obtain a crop of potatoes from seed, but the reason of this has been that the young plants when transplanted have not been separated far enough from each other.

2. The potato generated in this way exhibits constantly a great vitality. The vegetation is much more luxuriant, and the produce of the tubers more abundant. In September, 1845, the reporter counted on a single stem of a potato plant 102 tubers, all adapted for future seed; whilst on the stem of one of the mother-plants near by, there were only 13 tubers, although larger on an average.

3. Potatoes grown from seed are more durable. On the 10th of October 9 bushels of potatoes from seed were placed upon a floor in a heap, and at the same time three-quarters of a bushel of the parent potatoes. Fourteen days afterwards, 16 faulty individuals were picked out amongst the last, whilst in the first not a single unsound tuber was discovered. In fact, the disease (and this more particularly applies to the dry gangrene before mentioned) has not developed itself in the potatoes produced from seed.

4. In one case reported in the appendix, the produce of tubers obtained from seed was 2 4-5ths

greater than that obtained from the mother potatoes on the same piece of ground, and this is in accordance with the previous results.

5. Notwithstanding that the half ounce (*loth*) of potato-seed cost from 3 to 4 thalers in previous years, and from the frost in the beginning of September spoiling the potato-apples this year, raising the price to 4 or 5 thalers the half ounce, yet the expense of growing the potato from seed is less than from the tuber.

The planting of two Magdeburgh acres with tubers cost :—

	th. gr.
For 20 bushels of tubers, at 12 groschen a bushel - - - - -	10 0
Four women to plant the same after the plough - - - - -	0 12

	10 12

For planting from seed the following was the cost :—

	th. gr.
For a half-ounce of seed for sowing two acres	4 18
For 12 women, employed in transplanting, &c.	1 12

	6 6

6. The plants produced from seed generally resembled the parents; but sometimes entirely new varieties are produced.

At the end of this report is a note by Mr. Isensee, in which he says, " I hold the renovation of the potato from seed as a highly important matter. I can confirm the statement that the potatoes yielded by plants grown from seed have an especially beautiful and sound appearance, a remarkably powerful development of the root, and generally a luxuriant vegetation. I have also seen that the small and very smallest potatoes of the crop grown from seed in 1844, and which were planted in the spring of 1845, yield extraordinarily fine and sound tubers, combined with an incredible productiveness, so that I believe large potato cultivators would find it greatly increase the produce of their harvests if they from time to time renovated their crops by raising potatoes from seed. I believe also that some of the plants, after the transplanting of the others, and thinning, might be left in the place where they were sown, and would there yield tubers whose produce would be good both in quantity and quality, and which would serve for planting a subsequent year."

The appendices alluded to in the report consist of various reports and papers bearing on the question of the value of the crops of potatoes procured from potato seed. The first five papers consist of reports given by committees of agricultural and other societies on this subject. They are drawn up in the form of question and answer, and the princi-

pal results have been given in the preceding remarks.

One of the papers in Appendix A is upon the chemical composition of tubers produced from seed and from potatoes. This paper is by Dr. Dobreiner. He submitted the several sorts of potatoes obtained from seed to a chemical examination, which had for its object, more particularly, the ascertaining the quantity of starch fibrine (*faserstoff*), and water. The results were as follows, in 1,000 parts :—

	Potatoes from Albert.	Potatoes from Krause.	Potatoes from Greger.
Water - - -	714.4	756.2	810.9
Starch - - -	115.9	110.5	107.0
Fibrine, starch-like-Substances soluble in water - - -	70.9	52.5	50.0
	98.8	80.8	32.1
	-----	-----	-----
	1000.0	1000.0	1000.0

The quantitative analysis of substances soluble in water was not made; from the researches of other chemists they are as follows :—

Albumen		Tartaric acid)
Gum		Salts
(Sugar		Asparagin
Phosphoric acid		Solanin
Citric acid		

The published analyses of Einhof, Henry, and Lampadius, are then given, which were made on potatoes produced by tubers. The following analysis by Dobreiner is given of a large sort grown in the year 1845 :—

Water - - -	740.9
Starch - - -	120.0
Fibrine - - -	48.9
Albumen - - -	90.2
Gum, &c. - - -	90.2

	1000.0

The most important elements may be seen in the following comparison :—

Substances.	Potatoes from tubers after the researches of Einhof, Henry, and Lampadius.	Potatoes from seed by Dobreiner.
Starch . . .	15 per cent.	11.1 per cent.
Fibrine . . .	7 "	5.7 "
Water . . .	73 "	76.0 "
Gum	4 }	
Albumen . .	1 }	7.2 "

Of the remaining elements of potatoes, Henry, in his researches, gives 3.3 of sugar and 0.1 of fat; Vauquelin 0.1 of asparagin, a highly nitrogenous substance found in asparagus; 1.2 of citrate of lime; and an undetermined quantity of pure citric

acid, citrate and phosphate of potassa, and phosphate of lime—substances which, in their quantitative analysis, determine the greater or less value of the potato. In addition to these, Buchner, Barry, and Otto have pointed out the existence of solanin, a poisonous substance, which is found in largest quantities during the germination of the potato, and is the cause of the paralysis which comes on in the extremities of animals which have been fed upon potatoes that have been used by the distillers.

The following table gives the result of the chemical examination of potatoes at various seasons of the year. Two hundred and forty pounds of potatoes contain, of starch—

	lbs.	lbs.		
In August ..	23	— 25	or	9.6 — 10.4 per cent.
September ..	32	— 68	„	13.3 — 16.0 „
October ..	32	— 40	„	13.3 — 16.6 „
November ..	38	— 45	„	16.0 — 18.7 „
April	38	— 28	„	16.0 — 11.6 „
May	28	— 20	„	11.6 — 8.3 „

From which results it will be found that potatoes ought to be protected against frost, heat, and germination.

Payen found starch and water in the following proportions in various sorts:—

	Starch.	Water.
Rohan potatoes ..	16.6 ..	75.2
Large yellow do..	23.3 ..	68.7
Scotch do.	22.0 ..	69.8
Irish do.	12.3 ..	79.4
Suganzak do....	20.5 ..	71.2
Siberian do.....	14.0 ..	77.8
Duvilliers do ...	13.6 ..	78.3

From this table it appears that starch and water exist in potatoes always in an inverse proportion; where there is most starch there is least water, and *vice versa*. It will also be found that starch and water together constitute from 91.7 to 92 per cent. of the mass of all potatoes.

Appendix B. Upon the regeneration, or profitable propagation of potatoes from seeds, by Inspector Tinznann, of Laasnig, in Silesia.

The variety of opinions which exist with regard to the proper culture of the potato determined me to undertake experiments for myself, which I have now carried on for ten years; and as the results of their propagation by means of seeds appear to be important, I have determined to give them to the public. In the commencement only a few plants were tried; but as the result was good, this plan of culture has been continued till now. The propagation of potatoes from seeds is attended with many advantages. The potatoes are by it regenerated, their produce is increased, and, what is of most importance, the potato itself is very much improved. The tubers, also, of potatoes produced

from seed are able to resist the influences of weather, &c., much better than those grown from eyes, germs, or peels, in the usual way. It has also the advantage of a saving in the sowing, as, although small potatoes are used when the crop is grown from the tubers, yet these may be employed more profitably for feeding animals. In the growing of potatoes from tubers there is no certainty with regard to the crop, as a fine-looking potato may have weak vital powers, or the germs, on account of imperfect nutrition, may not be able to develop healthy plants. The following is the history of my experiments:—

In the autumn of 1833 the seeds of an ordinary variety of field potato (Futter-Kartoffel) were collected, and sown in a garden on the 16th of April, 1834. From mismanagement, only 12 plants made their appearance, and of these 9 were transplanted in the middle of June. They were then 5 inches high, and were placed a foot apart from each other. This was an exceedingly unfavourable year for this experiment, on account of the drought that prevailed. When these plants were dug up, they yielded only 73 potatoes. The largest were the size of a hen's egg, the smallest as big as a hazel nut.

In the year 1835 these 73 potatoes were planted out in a field, and the whole of them, even the smallest, produced plants. They were easily distinguished from the old sorts by their vigour, their dark green leaves, and more luxuriant growth. The produce in 1836 was 1,042 tubers, or 1½ bushels. These were again planted, and in 1837 produced 21 bushels, which were again planted, and produced 417 bushels; of these, 223 bushels were planted, and yielded 3,140 bushels; the rest were sold. We may calculate from this that in five years 9 plants yielded 6,000 bushels of potatoes. The produce of the new potatoes, as compared with the produce of the parent potato, was as 14 to 8½; and the bushel of the new variety weighed 91lbs., whilst the old weighed only 81lbs. [These are German weights and measures.]

The second experiment was made with the German table-potato (Speise-Kartoffel). The seeds were sown on the 26th April, 1836, which came up, and 60 plants were transplanted on the 20th of June following. The produce was 5½ metze (a metze is the sixteenth part of a Scheffel or Prussian bushel). The tubers were small, not any larger than a dove's egg, and were 1,382 in number, or 23, on an average, to each plant. These were planted in 1837, and yielded 8 bushels of perfectly formed potatoes, with an excellent flavour. In the year 1838, 3 bushels were planted out, and 56 bushels obtained. The produce of this variety was always greater than the last, as it afforded, on

an average, from 60 to 70 tubers on each plant. Although in the first produce many of the tubers were very small, this was found to be no disadvantage in using them as seed-tubers, the very smallest frequently having the largest number of eyes, and yielding the greatest produce.

The propagation of potatoes from seed having been found so valuable, I have adopted the plan, and now possess a large assortment of different varieties. The following table has been drawn up for the purpose of affording a view of the relative merits of potatoes grown from seeds and tubers :—

KIND OF POTATO.	Quantity.		Quality.		
	Acre gave.	Bushels weighed.	Starch.	Fibrine.	Water.
		lbs.	per ct.	per ct.	per ct.
1. Field-potatoes from tubers	82	81	6 $\frac{1}{4}$	25	68 $\frac{3}{4}$
2. The same from seed	140	92	9	30	61
3. German garden-potatoes from tubers	92	82	6 $\frac{1}{2}$	19	74 $\frac{1}{2}$
4. The same from seed	104	91	8	23	69
5. Early kidneys from tubers	93	90	6	20	74
6. The same from seed	106	94	9 $\frac{3}{4}$	25	65 $\frac{1}{4}$

As these three sorts of potatoes were grown on a soil of equal goodness, and received the same treatment, they prove very satisfactorily the advantage of the raising of the potatoes from seed. I might communicate the result of experiments on other kinds of potatoes, but they are all equally favourable to the plan of culture now recommended. I will now say a few words on the obtaining, treatment, and sowing of the seed.

In order to obtain good seed, not more than from two to three of the fruits or apples of the potato plant should be allowed to come to maturity. For these the most perfect should be selected, and all the rest cut away. In the neighbourhood of the plants selected for seed no other sort should be allowed to grow, because the pollen of the other plants may mix with those intended for seed, and the sort will thus be changed. Of this I have had ample proof, and have sometimes had the varieties of potato spoiled by such a mixture. It is well known that a change in the variety of a plant can only thus take place by the application of the pollen of other varieties. Sometimes this mixture of other pollen exerts a powerful influence, and I have found that sorts of potatoes that would not bear seed from impregnation with the pollen of their own flowers, would bear it when impregnated with pollen from other flowers.

The ripeness of the seed may be known by the softness of the apple; or should not this come on in late varieties, then when the vegetation dies. I collect the apples generally at the time the tubers are dug up. They should be then placed in a damp, not a wet place, as in a cellar, till decomposition takes place. The pulpy parts should then be separated by squeezing, and the seeds washed with luke-warm water; the seeds should then be picked out, and washed carefully several times, until all the mucus is got rid of. This is a point of great importance, and it was from not properly separating the seed from the investing mucus that I did not succeed so well in my first experiments. When left on, the mucus prevents the seed from germinating. The seeds after washing should be dried in the air, and kept in a well ventilated place.

When varieties are wished to be produced, a fine dry still day, when the plants are in full blossom, should be chosen, and the pollen of the one plant be carefully applied to the stigma of the other with a camel's-hair pencil. This process it is very desirable to adopt where none of the potatoes of a district will bear apples at all, as it frequently happens that potatoes are borne after this artificial impregnation.

In the cultivation of potatoes from seed the following notes may be of service. The seed of the potato should either be sown at the latter end of April or the beginning of May, in a loose soil, which, during the previous autumn, had been well manured. The ground should be sown thinly and in rows of four inches apart. The young plants will have appeared within ten days. The ground should be carefully cleared of weeds. At the end of about eight weeks they will be four or five inches in height, when they should be dug up and planted out in a well worked field, about eighteen inches apart in breadth, and seven inches in a line. In the course of time the soil should be loosened with a hoe, and later dug up, and housed in the same way as other potatoes.

The potatoes obtained from seed the first year do not attain their perfect size, and are watery and not agreeable as food; they seldom attain the size of a hen's egg, and the majority are not bigger than a hazel nut; but in the second year the potatoes grown from these attain a large size, and deliver as fine and perfect a fruit as possible.

(To this statement of the Herr Tinzmann, Justizrath Isensee appends a note, stating that the results of his observations differ from those of the author. In the previous report from Herr Albert, and in the reports in Appendix A, it will be seen that the first crop of potatoes was large, free from any large amount of water, and eatable. This was the case, not only with the early sorts of potatoes, but with

the later sorts, the same as those referred to by Herr Tinzmann.) An important point to be attended to is the preservation of the seed tubers during the winter. They should be carefully stowed away before heating takes place, so as to produce germination; and this should be done as soon as possible after the taking up of the potatoes. If the seeds are sown in February on a hotbed, then the potatoes which are produced may be employed for food; but I prefer the second year's produce. (It will be seen from preceding parts of the reports that it is not necessary to take this precaution to secure as useful a crop the first year.)

Since obtaining the foregoing results from the propagation of potatoes by seed, I have not only always had abundant crops, but they have all been free from the various forms of potato disease.

Appendix C. In number 245 of the "Berliner Zeitung," of the 20th of October, 1845, the following occurs. The minister of the interior is induced to lay the following communication before the public:—The prevalence of a disease in potatoes in various parts of the world has led some to the conclusion that it is desirable again to raise potato-plants from seed. There appears, however, to have been but few experiments performed upon this subject, and, consequently, persons have been led to doubt its value. An experiment has, however, lately been performed by Herr Zander, of Boitzenburg (Court Arnim's gardener), in which he not only obtained potatoes from seeds, but when all others were attacked with disease these were found free. The following is the plan pursued: The berries of the potatoes are collected in the autumn, and are squeezed with the hand into a pot or other vessel, in which they should remain six or eight days, to decompose, by which process the pulpy part separates from the seeds; the seeds are afterwards washed with water, and treated in the same manner as the seeds of cucumbers. They are then dried, and kept in a warm and dry place. At the end of March, or the beginning of April, the seeds are sown in a hotbed, and are treated generally in the same manner as early peas. The young plants should be protected from the frosts to which

they are exposed at the season of year in which they are planted. In the month of May he transplanted and planted in a light soil at the distance at which potatoes are usually planted. Zander's plants were sown on the 11th of April, and transplanted, on the 26th of May. The plants at the harvest yielded largely, and one plant gave 280 tubers. Zander has grown potatoes thus for the last five years; and while the potatoes all around have been subject to attacks of disease, those grown from seed have been free. The success of these experiments ought to induce persons, wherever the potatoes are not got in, and berries have been produced, to collect the seed for the purpose of sowing in future years, should the crop turn out to be a failure. The space required for sowing seeds, in order to plant an acre of land, is not more than a square rod, so that persons with only a small amount of land may successfully pursue the plan.

Appendix D is a short report made on the 7th October, 1845, by C. Berendt, on the merits of the potatoes grown by Herr Albert, from seed; which is very favourable.

Appendix E.—The president of the Agricultural Society of Rosslau and Cöthen, in consideration of the importance of the subject, had been induced to allow the collection of seed under the superintendence of an experienced farmer, for the purpose of supplying those who may wish to have it.

Appendix F.—Potatoes from seed by Von Blacha, of Jaschine, near Kreuzburg. In consequence of the marked diminution in the germinating power of the potatoes of this district, I three years ago obtained, by means of washing, an ounce and a half of seeds from sound potato berries. These were sown, for the sake of experiment, the first year in a hotbed, and when the plants were up, and no frost to be feared, they were planted in the open field. From these I had the first year one sack and a half, the next year 12 sacks, and the present year 95 sacks of perfect and good potatoes. All my potatoes are, at present, infected with the prevailing disease in a high degree, except the 95 sacks obtained from the seeds, and they are all perfectly sound.—Gardeners' Chronicle.

BURTON-ON-TRENT FARMERS' CLUB.

The usual monthly meeting was held on Thursday evening, the 8th instant. Mr. Harding, who had engaged to introduce the subject of discussion, being unable to attend, the secretary (Mr. J. D. Greaves) undertook the task of supplying his place, and read the following remarks:—

"As it was only yesterday afternoon that Mr. Harding informed me of his inability to attend the

club this evening, I had no time to arrange with any other member to bring forward the subject for which he was engaged; and I have therefore ventured to take Mr. Harding's place, rather than allow the club to separate without expressing its opinion on the question proposed for discussion. But as I have not considered the subject attentively, with the view of bringing it before your notice, I

must claim your indulgence for the necessary imperfection of my manner of treating it. I have merely thrown together the results of my own experience in the management of dairy cows.

“The point to which our attention is particularly called is, whether it is more profitable to feed dairy cows liberally, and prolong the time of milking them; or to let them dry in the winter, and give less expensive food. In my opinion, the profit on a dairy depends more upon the mode of our practice in regard to this point, than on any other part of the treatment of the cows; and I would therefore recommend every one to subject the two opposite plans to the test of experiment. I see instances around us, where, on the same kind of land, one dairy is made to produce twice, and more than twice as much cheese as another; and it is, I think, well worth our inquiry, whether those who get the largest produce, do not, at the same time, reap the largest profit.

“The system most commonly pursued in this district is, to let dairy cows dry in seven or eight months after calving, and to keep them for the remaining four or five months of the year on a not very thriving diet of a moderate allowance of hay, of hay and straw, straw and turnips, or even straw alone. I am inclined to think that this system has had its origin in times when the state of agriculture forbade the providing of any considerable quantity of winter provender, and that it is continued more from habit than from any well grounded reason of its superior profitability. I have myself pursued an entirely opposite plan. I milk my cows until near their time of calving, and never give them any but the best kinds of food, and in unlimited quantities. I am very well satisfied that this is the most profitable system, and will shortly state the reasons which lead me to think it so.

“A cow kept in milk for seven months will usually yield an average of twelve quarts of milk a day during the whole time. The value of the milk I calculate to be about 1½d. per quart; so that the yearly produce of a cow on this system is thirty weeks' milk at about 9s., or £13 10s. in all. Against this you have to set off the keep of the cow for the seven months, and also the expense of keeping her through the remaining five months of the year. At the end of the seven months, when the cow is let dry, she will be one-third less in value than when ready to calve; that is to say, if at the time of calving a beast be worth £18, she will only be worth about £12 when dry, and requiring to be kept four or five months before her next calf. About £6, therefore, is to be deducted from the value of her produce for this unprofitable part of the year, which is at the rate of 5s. 6d. a week.

“A cow out of milk, and in calf, will not be sus-

tained in good condition on less than 1½ cwt. of hay per week; which is, on the lowest calculation, worth 5s. 6d. per week. If other food be substituted for hay, the cost will still be the same, if the food be equally nutritious; for, on the average of times and seasons, an equal quantity of nutriment—whether it be in the form of hay, roots, or corn—will cost nearly the same sum. It is possible to avoid a part of the expense of keeping the beast, by substituting cheaper and less nutritious food—as straw, wholly or in part; but if this be done, the cow will be quite as much lessened in value at calving time as the saving in her food will amount to; for unless a cow be in good condition when brought into milk, great part of her food will be consumed in repairing her wasted body, which would otherwise be converted into milk. I do not, therefore, see how it is possible to diminish the expense of keeping the cow while she is yielding no return. But suppose that instead of letting a cow dry at the end of seven months, you prolong the flow of milk for another three months: the expense of keeping her is wholly, or for the most part, repaid in the additional produce she will yield. A cow takes 1½ cwt. of hay, or its equivalent in other food, to maintain her in health and flesh. When full of milk, she will require 2½ cwt. of hay per week: thus, you get for the additional cwt. of hay, a return of from twenty to thirty gallons of milk. Whatever food you give beyond what is necessary to repair the daily waste of her own body, a cow will return to you in a product three, four, or five times as valuable as the food she consumes.

“If you let a cow dry, she costs you 5s. 6d. per week for her keep; but if you add another 2s. 6d. to her food, she will, for three months longer, give you back an average of a gallon or five quarts of milk at a meal. The value of this quantity of milk is 6s. or 7s. per week. Thus the cost of her keep is diminished to 1s. or 2s. per week, instead of 5s. 6d. for an additional twelve or thirteen weeks. This plan I have pursued, and have contrasted it with the other, and have satisfied myself that it has fully the advantages I state. It has, indeed, more; for not only will the expense of keeping the cow be lessened during the time when she is usually kept dry, but when she is kept full of milk for a longer period, the produce from the sixth and seventh month after calving is very much greater than when she is let dry at the end of seven months.

“The objections which are usually urged against the plan of high feeding and continued milking of dairy cows are such as nobody would make who had steadily pursued and tried it. First, it is said that it is not possible to prolong the flow of milk in cows beyond seven or eight months, and secondly, that if you milk them till within a few weeks of

calving, the quantity of milk they give after calving is much diminished.

“With regard to the first objection, that you cannot prolong the flow of milk, I think it would be more in accordance with the fact if it were said that you have difficulty in controlling its flow. Cows differ from each other in their aptitude to milk for a long period, and young beasts certainly cannot frequently be made to milk longer than till within four or five months of calving. But as a general rule, cows which have not been pinched in their first years, and are not bred so as to possess a more than ordinary propensity to fatten, will continue to milk as long as plentiful and good food and a defence from cold are supplied to them. If in the autumn, cows are kept on insufficient pastures, or are not taken into the sheds when cold weather sets in, they will certainly lose their milk. A cow when she is new melched will milk, though her food be insufficient; she will give milk, though her body wastes; but in four or five months, if her food be not more than is sufficient to sustain her body in full and juicy condition, and to supply also the materials of milk, she will cease to milk, in order that the body may be better sustained. But give enough food and keep her warm, and you will generally find that a cow, if she comes of a good milking breed, will continue to give milk until within a month of calving, and longer, indeed, unless you purposely check its flow. A cow that will not do this is the exception, and not the common instance. I invariably find that my cows, when taken from grass in the autumn, increase their milk in the sheds; and I have repeatedly—indeed, it is my common practice—bought half dry cows, which have renewed their milk under the different management they have met with in my sheds. Though, therefore, there are instances of cows which will go dry in spite of all you can do, yet it is very easy to cull such from your dairy, and retain only such as have the habit which you require.

“As to the other objection, I grant that where cows are not highly fed, both during their time of milking, and while dry, they will not milk so well after calving, unless they have been allowed to remain dry nearly three months. But this is not the case when they are fully fed and I find that my cows, which have been let dry for two months, milk as well immediately after calving as those which have been dry longer. I find that if I milk them until within a month, or up to the time of calving, my cows fail to give so much milk in the month or six weeks immediately following. At the end of that time, however, I do not perceive any difference in two cows treated differently; and I do not feel sure that it is not, on the whole, as

profitable to keep on milking them up to nearly the time of calving; for in the last two months the milk is renewed in greater quantity—so that I think that perhaps a good deal more is gained in the two months preceding, than is lost in the two which follow calving. I have, however, hitherto preferred generally to let them dry at six weeks or two months; because, though there is perhaps a little more immediate gain in the opposite plan, yet I cannot help thinking that the rest is of some benefit to the health and vigour of the beast. Still, I must remark that I sometimes milk a barren cow for two years, and do not find that it injures her in any way.

“I scarcely think that any judicious farmer will in this day advocate the plan of keeping milking cows in the straw-yard through the winter, in order to avoid the expense of their keep while dry. With every kind of stock, it is profitable never to let them sink in condition; but I think it is more injurious to the farmer's interests to stint the dairy cows than his store stock. I am certain that if a cow be kept low in condition through the winter, her field of milk all through the following summer will be diminished, so as to more than overbalance the saving effected in her keep. Let one dairy be kept on full food during the winter and summer, and let another be pastured in summer on equally good land and put to straw four or five months in winter: the difference between the yield of milk in the two will be twice the amount of the difference in the expense of their keep. A cow stinted in the winter cannot be made to yield as much milk as another that has been well fed; neither can you make her continue to milk for a long period. But if you keep a cow well in the winter while dry, the cost of her food will certainly take all, or nearly all the profit of her produce, if you have to maintain her for five months. This is felt to be the case by most farmers; for wherever it is the practice to keep up the condition of the dairy in the winter, it is commonly seen that they are made to milk eight or nine months. I feel confident that all who try the plan judiciously will find it better to extend the time of milking to ten or ten and a half months, and to let the cows dry only six weeks or two months. This is the system pursued in those countries and districts where superior methods of farming have been longest practised; and when it is seen that a change from one system to another is becoming general, we may conclude that experience, the sure guide, has proved the change to be profitable. There may be difficulty in procuring a sufficient supply of provender to continue the milking of the cows through the winter on a purely grazing farm; but wherever arable and pasture land are joined in one farm, winter roots or cabbage must be grown, in

order to get a sufficient supply of good manure. The manure made from milking beasts is not, of course, so rich as that made from feeding beasts; but, on the whole, I think the profit would be greater, in consuming the produce with the dairy. It may be asked, perhaps, what is to be done with the straw of the farm when all the stock is kept on good diet through the winter. It is very easy, however, to consume the straw in such a manner as will make it form the chief part of the diet of milking or feeding beasts. A proper mixture of turnips and straw with beans or oilcake will produce either milk or fat, or keep the young stock in thriving condition just as well as food in which hay forms the chief part; and the expense of the corn or oilcake will always be repaid, in the superior condition of the cattle, or the greater amount of produce from them.

"I cannot help remarking how very much our system of dairy management is behind the other department of fattening cattle. The most perfect care is bestowed in improving the breeds, so as to increase the aptitude to fatten in the highest degree. We know exactly the quality of flesh and the form of body which mark the habit of constitution that will give the greatest quantity of fat in return for the least quantity of food. But, as yet, almost nothing has been done towards perfecting a breed of animals that shall possess the same improvement of their milking qualities that has been given to the fattening propensities of our most celebrated breeds. Yet we all know that the aptitude to milk is inherited by the offspring of a good milker; and there is little doubt, if equal sagacity were employed to perfect the breed of milkers, that we might attain to as high a state of perfection in this as we have already attained in the fattening breed. If I might venture to give an opinion upon a point on which so many good authorities oppose me, I should say that it is not possible to unite the two qualities of an extreme aptitude to fatten and to milk profusely in the same animal; for when you approach the perfect form of a feeding beast, and the kind of constitutional habit which disposes to lay on fat, the milking properties of a cow almost invariably decline. Generally, cows derived from a perfect fattening breed will not, in the first months after calving, yield so much milk; and almost always it is found that, after six or seven months, they will cease to milk, and will lay on fat in preference. Though I admit, therefore, that our dairy cows have been much improved by the attention which has been paid to the breeding of feeding beasts, and that to a certain extent the improvement of the feeding properties will also improve the milking qualities of the cow, I think that much mischief has been done by attending too exclusively to the pro-

pensity to fatten in cows which are to yield a profit only by their good milking properties. In districts where the rearing of store stock is the chief object of attention, the feeding properties of the cattle may very properly be more regarded than the aptitude to milk; but in dairies, where the chief object is to get the greatest return of milk produce, every step which is taken to promote the fattening at the expense of the milking properties of the stock is, I think, injurious. There prevails a pretty general impression among dairy keepers, that a highly bred bull does not improve their profits; but if there should arise a breed of animals (as I hope there will) as famous for their milking properties as for their shape and other merits, we should then see the character of the dairy stock universally improved. But at last, I am inclined to believe that the true reason why we have not an equally good milking as fattening race of cattle is, that the dairy farmers are not so careful in rearing their stock, nor in treating them liberally, as the breeders of fattening cattle. Any race, whether of milkers or feeders, will soon degenerate, if not kept well while young, or if sent into the straw-yard for the winter when they grow up. I do not, therefore, look for a considerable improvement in the breed of milking cows until the system I have been recommending is more generally adopted."

There was but little discussion on the opinions advanced by Mr. Greaves in his paper, all the members present being of opinion, that it was most profitable to continue to teed cows well through the winter, and to milk them till within two months of calving. There was, however, some difference of opinion as to the extent to which it was profitable to carry the system of full feeding of milking cows. Mr. Hollier and Mr. Ward thought that a moderate use of oilcake and corn was productive of a larger return in milk than repaid its cost; while Mr. Ordish argued that such stimulating food had a tendency to make cows fall off in milk when turned to grass, and was rather productive of an useless degree of fat than of milk.

VETERINARY PROFESSIONAL ANNUITY FUND.

Ne quid falsi dicere audeat, ne quid veri non audeat.—CICERO.

We can assure Mr. Anderson—whose letter appears in our pages—that we had not forgotten Mr. Baker's truly philanthropic "Suggestions for the Establishment of a General Annuity Fund." We have been waiting to hear the sentiments of the professional body on the subject. As yet, however, we have received but two communications

thereon—one from Mr. Anderson, the other from Mr. W. A. Cherry. After the pathetic and eloquent appeal of Mr. Baker, in our number for January, we had, we must confess, reckoned on receiving more letters than two by way of response. Should that appeal—the re-perusal of which we strongly recommend—fail, we should, for our own part, despair of success. Mr. Cherry's communication is forcibly argumentative in favour of the scheme; but surely argument in any shape can hardly be requisite to induce men, members of a common profession, to embark in an undertaking, at comparatively little cost to themselves, which, in the day of old age or sickness coming upon them in narrowed circumstances, or of their leaving behind them wives and families unprovided for, promises sustenance at least, if not a provision, for them. The groundwork of Mr. Baker's scheme speaks for itself. Five hundred members are required to subscribe annually a guinea a head; an increasing stock which, provided it be left untouched, and have all accumulative interest added to it, will, at the expiration of five years, amount, together with the annual subscriptions, to a yearly income of £600, available for the purposes and objects of the general fund. Now, the first thing to be done is, as near as we can, to ascertain what number of subscribers we are likely to have. The general meeting of the chartered body, which will take place on the first Monday in May, will afford an excellent occasion for bringing the subject forward. In the meantime, we shall be happy to hear from such of our readers as think well of the project.—Veterinarian.

ON THE CHOICE OF SEED POTATOES.

The subjoined extract is from a paper on the "Selection and Preparation of the Seed," by J. F. W. Johnston, F.M.S., &c., &c.

"While the above was in the printer's hands, a strong opinion has appeared in the *Gardeners' Chronicle*, from the pen of Professor Lindley, in reference to the choice of seed potatoes. His words are, that "*diseased potatoes will produce a diseased crop*. Not a shadow of doubt remains on that point." "That GREAT DOUBTS EXIST AS TO THE FITNESS FOR SEED OF APPARENTLY SOUND POTATOES FROM DISEASED DISTRICTS," and that, "if healthy potatoes can only be discovered by cutting into slices, THE CROP OF NEXT SEASON IS DOOMED, wherever sets from diseased fields are employed." (The Italics and capitals are copied from the *Gardeners' Chronicle*).

The facts upon which this opinion is founded are the following:

1. That a brown gangrene on the haulm underground, and rotting blotches on the leaves, had appeared in potatoes (no variety indicated) which had been planted

in the autumn, at Bicton, in Devonshire. Of the samples examined, "one, and much the worst, was the produce of 'rather badly affected tubers.'" Another sample, "from tubers *supposed to have been sound*," also manifested symptoms of the disease. One tuber appeared to be quite sound both within and without, and yet disease had appeared in the haulm just above the tuber. Some of the Bicton potatoes had formed tubers and roots without haulm or foliage, "bobbin joans," as they are called in Cornwall; and the disease showed itself in the very centre of these peculiarly formed young potatoes.

2. Plants in the garden of the Horticultural Society were also found in a state of disease, the underground haulm having already begun to decay in blotches. These plants were obtained from diseased tubers, planted for the purpose of experiment. The variety is not stated.

3. The disease has attacked plants (early kidneys) which were being forced in frames at Oulton, in Cheshire (Sir Philip Egerton's), and a variety not named in a market garden belonging to Mr. Hale, at Ware, in Hertfordshire.

Every thing from the pen of Professor Lindley is entitled to great respect, but we hope he has in this case been hasty. We do not think the few cases of disease above quoted justify his broad conclusions. We agree so far with his first conclusion, as to be of opinion that diseased potatoes are not unlikely to produce diseased plants; and, therefore, we have recommended (p. 186), the careful selection of sound seed. But we do not think such a result a *necessary* one. We are still more inclined to suspend our judgment in reference to the alleged danger of using sound seed from infected districts. We have at present *buff* potatoes growing, with shoots twelve inches in length, apparently in perfect health from the potato upwards, and with green leaves without a visible taint; and yet these began to shoot in a potato pit, with rotting potatoes sometimes in contact with them. We cannot tell how these potatoes may ultimately turn out, but at present they give no countenance to the disheartening conclusions of Dr. Lindley.

We venture even to express the opinion that a sound cup, American early, or forty-fold potato from the middle of a diseased district may be planted with less risk of failure than *buffs*, flat reds, or lumpers, which have been procured from a district in which no disease has hitherto appeared. Should the experiments we now have in progress lead us to a different conclusion, we shall not fail to communicate it to you without unnecessary delay."

Edinburgh, Feb. 1846.

DALTON FARMERS' CLUB.—On March 18th a Farmer's Club was formed at Dalton, in Lancashire. The attendance was highly respectable. They met at the Cavendish Arms, and several resolutions were proposed and carried. Indeed the opinion was universally expressed that the time had arrived when an onward move should be made, and that the best works on agricultural subjects should be procured for their instruction.

LONDON FARMERS' CLUB.—MONTHLY MEETING.

SUBJECT FOR DISCUSSION :

CONVERSION OF GRASS LANDS INTO TILLAGE.

The usual monthly meeting of the members of the London Farmer's Club was held on Monday, March 2, in their rooms at the York Hotel, Bridge-street, Blackfriars, Mr. Baker, of Writtle, Essex, in the chair.

The CHAIRMAN, in opening the business of the meeting, said: The subject which stood for the evening's discussion was the best mode of converting grass lands into arable lands, that was to say, of bringing them into cultivation. The question had been given to Mr. Shaw, of Northampton, but had not originally stood for to-night. In consequence, however, of Mr. Cuthbert Johnson's having been prevented from attending this evening to bring forward his question on manures, it had been arranged that the order of the two questions should be exchanged. But it unfortunately happened that Mr. Shaw also was unable to attend this evening; he had sent an intimation to their secretary, Mr. Thorpe, to this effect, requesting that some other gentleman would take the lead in the matter in his stead, and expressed a hope that he (the Chairman) would do so. He was certainly not prepared to open this question in such a manner as to do it that justice which its importance demanded; but, in order to carry out the objects of the club, he had got together a little information for the purpose of doing so (*cheers*). At the same time if there was any other gentleman present who was prepared with any observations, he would rather that he would take the opening of the discussion upon himself.

Several members of the club expressed a desire that Mr. Baker would favour them.

The CHAIRMAN accordingly rose and said: That his ideas upon this subject were compressed into a very short compass. First, as to the practical part, in which he had had some experience, for he had seen it partially carried out in his own county, and he had made inquiries respecting it in other localities. He begged to tell them that in his neighbourhood the usual system of converting grass lands into tillage by burning and paring was not much practised. Essex was a "burning" county; but still the lands generally were of a more level character and better quality than those to which the burning and paring system was usually applied, and therefore they adopted the plan of ploughing. It must be apparent that, in the case of coarse lands and uneven surfaces, the burning and paring system was by far the best that could be adopted, because there were large masses of vegetable matter which it was impossible otherwise to reduce to a proper state to be useful in raising plants. It had been found that, of all descriptions of manure, the ashes

which were obtained from paring and burning land of the character to which he had alluded were one of the best—in fact they were superior to almost any other kind of manure that could be applied; and therefore there was a very great advantage derivable from burning in the first instance. When there were coarse and inferior lands to be dealt with, the best and the cheapest mode was gradually to burn them into cultivation as the farm might require root crops. Now, with paring and burning, very much depended upon the manner in which the process was carried out. Upon stiff clays it destroys the tenacity of the soil, makes it assume the quality of lime, or something very nearly approaching to that, and tends very much to improve the working of such a soil. That is the effect upon clay soils; but upon light gravelly soils burning becomes a most wasteful proceeding. In this case so much is carried off by the process, and so little remains of inorganic matter, that the loss becomes much greater than by ploughing in. One great point to be observed in the paring and burning system is, to burn slowly and gradually, and to avoid getting up too much heat. This can hardly be effected by burning in small heaps, and therefore he thought it much better to burn in large ones. If the smoke is well stopped in, all goes on well; and the effect is much better than in the smaller heaps. With the Essex soils the burning generally assumed a redness, or brick-dust character. Now he had heard this objected to, and said that wherever the land was converted into that red colour much of the benefit was lost. He (the Chairman) had learnt, however, in the course of his reading on the subject that this redness was an indication of the presence of the peroxide of iron, produced by the action of the fire upon the oxide of iron which the earth contained, and that so far from being injurious, it was much more beneficial to the purposes of agriculture than if the soil kept its black character, and did not assume that redness. Gentlemen present would, however, doubtlessly, be able to speak upon these points. In Essex very little grass land was allowed to be broken up. He (Mr. Baker) broke up some last year, in consequence of some of his arable land having been taken away. He stated to his landlord that the amount of the arable land was very small, and therefore requested permission to break up some grass land, which was allowed. He ploughed it up and rolled it, in the spring drilled in some oats, and from eight or nine acres had grown enough to keep a considerable number of horses. This year he intended to grow root crops, such as potatoes and mangel wurzel, and then

give it a dressing of lime. The lime had the effect of reducing into compass the vegetable matter which remained; his plan would be after that to take another crop of oats, and then a crop of wheat. He was quite satisfied that the wheat at the end of the fourth year would be better than if the intervening crops had not been taken (*Hear*). The cost of paring and burning appeared to be about 40s. an acre. In some districts breast-ploughing was adopted, and was found rather cheaper.

Mr. EDWARD MITCHESON wished to know whether the breast-plough was that which was known in some counties as "denshire?"

Mr. BAKER said, with the breast-plough the coulter was made very sharp, and it had a cross handle, which pressed against the man's breast. The furrows were drawn out in stetches; the stetches in Essex were usually about ten feet. In the burning system it was usual to cart off one-half of the ashes, and then adding about twelve loads of manure, the ashes taken off would mend a double quantity of land. One objection frequently taken to the burning and paring system was that it wastes the soil. His friend, Mr. Taberham, of Boys Hall, Essex, however, occupied a large farm, in which he carried out the principle, and improved it to such an extent, that at the end of twenty-one years it kept three times as many bullocks as previously (*Hear, hear*); and yet Lord Dacre stopped him, as he said he was quite satisfied that the soil would be greatly wasted, and the value of the property deteriorated. Upon this Mr. Taberham refused to keep the farm, and left it accordingly. He then took another farm at Navestock, in the same county, and the plan he adopted there was that of ploughing it out, taking off the turfs with a sort of feather-edge, and by that system he greatly improved the whole of the grass lands. The matter, however, which they had to consider was the best mode of converting grass lands into arable lands (*Hear*). His opinion was that in burning, the large heaps answered better than small ones, as the combustion was slower. That a great deal must be lost was perfectly evident. If the soil were burnt in an open fire, the whole of the carbon would be evaporated; but by the process of stopping it was retained. The substance which passed off was in fact carbonic acid gas, and unless great care was taken a very large proportion of this most useful property would be lost. The great object in conducting the process should be to burn only to a certain point, in order to retain that which was beneficial, and lose as little as possible. In stiff clay soils there was no doubt that this system of burning and paring was of much more benefit than in the lighter descriptions of sandy or silicious soils. In silicious soils he thought it was better not adopted; it was much better to depend on the slow decomposition of the vegetable matter which it contained, and which was perhaps better effected by the application of lime than by burning (*Hear*). It had been stated by some that ashes were of too absorbent a character, and that they never should be used except with manures. He had also

heard it asserted that a very small quantity of ashes, applied in composite heaps, would produce a much greater effect than when the ashes were applied to the land first and the manure afterwards. He gave these as the opinions of a practical man in Essex (*Hear, hear*). He was of opinion, from the experiments which he had made himself, that for an ordinary kind of pasture, there was nothing better than the system of burning. He had burnt some himself, to the extent of about two acres, the centre of which was peat six or seven feet deep, resting on clay, and filled with water rising from a powerful spring. His first step was to find out the spring, and having done this, he dug out the peat, burnt it, and produced a vast quantity of ashes, as it burnt very well. There was great difficulty indeed in putting it out, and the waste in that description of soil was immense; it was reduced to one-tenth of its original quantity. The ashes were only ten per cent. as compared with the soil burnt. But then the ashes were exceedingly beneficial and powerful. The first year after spreading the ashes white clover rose in such quantities as to be sufficient to mow of itself (*Hear*). These were the few observations which he had put together for the purpose of introducing the subject. But his practical knowledge was rather limited; for, although in the habit of laying down grass lands, he did not think this came within the scope of their inquiry to-night. There was a mode used in Essex called "double ploughing," which was used after a field had been laid down in rye-grass—one plough followed the other. The first went over the ground, and then the second came and entirely buried all the grass. On the second year the grass came up in a perfect state of decomposition; and after this, wheat was found to grow very well indeed (*Hear*). He begged leave now to say that he should be very happy to hear any gentleman who might have any observations to offer to the club.

Mr. SHAW, of the Strand, said he was quite sure that every gentleman in the room would agree with him that they were very much indebted to their excellent Chairman, Mr. Baker, for bringing forward this question in the absence of the gentleman (Mr. Shaw, of Northampton) who originally intended to have done so (*cheers*). He was, in fact, always ready to come to the rescue when any difficulty arose such as had occurred this evening (*Hear, hear*). He (Mr. W. Shaw), in the few remarks he had to make, would not pretend for a moment to put himself in competition with Mr. Baker in reference to the practical knowledge of this subject, had he not possessed some practical knowledge, and made observations of that which was passing around him when living in a district in which the paring and burning system was practised. His observation applied to light lands; in clay soils he had no experience, but in light lands he had, and he had observed pretty largely (*Hear*). In a large tract of country in the west of England the only system of breaking up old grass land which was practised was that of paring and burning; first taking a crop of roots, and thus laying the foundation for a succeeding

crop of corn. He knew that persons who had tried it elsewhere had brought the results of their experience to the Mendip Hills, and the consequence was that the whole of that country had been brought into cultivation by paring and burning, and then laying down corn crops (*hear*). He was quite satisfied that in some cases the system of paring and burning had with reason been found fault with; if persons attempted to repay themselves by taking crops of corn at once, they threw away all the advantage of the ashes; but if they took root crops first, they could not fail to realize as much as could reasonably be expected from such soils (*hear*). There was another point he wished to touch upon, namely, the question of the relative advantages of burning in large heaps as compared with small ones. He did not know whether it resulted from a different set of circumstances or not, that his notions differed from those of their excellent Chairman; but the result of his experience induced him to make the heaps as small as possible, always avoiding to calcine the ashes. He always had them watched, to see that they did not burn too strongly and too red, because he fancied the ashes were not so good when burnt fiercely and red as otherwise. Now, the results of Mr. Baker's experience seemed to be that the calcined earth possessed a quality similar to that of lime; but in that portion of the west of England to which he had alluded, their object always was that the ashes should be burnt slowly and as black as possible, under the impression that they preserved the largest amount of carbon. He had ventured these two or three observations on a part of the subject to which he could speak as a practical man; and, having done so, he should sit down, in hopes that some one possessing better information would address the meeting (*hear*).

The CHAIRMAN said he believed he was justified, on the authority of all the best works—namely, Loudon's "Cyclopædia," Rham's "Dictionary of Farming," and "British Husbandry," published by the Society for the Diffusion of Useful Knowledge—in stating that silicious lands ought never to be attempted to be burnt, for that the waste was so great that it was like concentrating manures into a narrow compass; and although the system might benefit the farmer in the case of one or two crops, the loss in the long run was very great. He certainly only spoke from the written experience of others. He was not able to test the matter by his own experience. The land which he had burnt himself was a heavy clay soil.

Mr. GRAY said that having had some little experience in this matter, he would venture to offer a few observations. About this time twelve months, having some land not so good in respect of its grazing qualities as the rest, he determined to break it up; and, after having ascertained that it was well drained, he commenced by turning it up with a draining plough, which threw up the soil in rolls like draining-tiles all up the field. This mode he thought decidedly superior to that of using the breast-plough. Some of his men wanted, at first, to pare it in the

common way; but, when they saw the superiority of this mode, they said they hoped they should never see another breast-plough as long as they lived (*Hear, and a laugh*). The way in which it was burnt was in large heaps, rather against his (Mr. Gray's) will, because he had always understood that it was best to burn it in small heaps. He had always thought that if the turf was simply charred, that was all they wanted. Finding, however, that he could not get it burnt in small heaps, he had it done in large ones. The time at which he did it was the month of April; and he was of opinion that it was much better to encounter the wet of April, than to wait for dryer weather, and have the vegetable matter to deal with at the latter end of May (*Hear, hear*). In burning, the wet would be much more easily got rid of than the vegetable matter; he made this observation, because he thought it was a fact worth knowing; he always found it more difficult to burn according as he commenced later in the season (*Hear*). With regard to the colour of the soil after it was burnt, he had generally found that, although it was red at first, it turned black afterwards. In the case of the land to which he referred, after burning it, he used Bruce's subsoil-plough, and drilled in some turnips, and a finer crop he never saw (*Hear*). With regard to the advantage of paring and burning in lands of the description of which they had been speaking, one great point was the destruction of the grubs and wire-worms. The wire-worm was a thing they had to contend against very much. In the case of some land which fell under his notice about ten years ago, he recollected that he had an infinity of trouble with it: it was taken up without burning, and crop after crop was destroyed by the wire-worm. He even had a crop of beans destroyed by wire-worms, which was a circumstance he never heard of except in that instance. However, on this land which had not been burnt, he was now growing the thirteenth crop of grain and roots in thirteen successive years, and four of them had been wheat-crops; only two were root-crops (*Hear, hear*).

Mr. FISHER HOBBS: Not four wheat-crops in succession, surely?

Mr. GRAY: No; four crops in the time, not four in succession: and lime only was applied twice during the period (*Hear*). He liked the system of burning best, as it was less trouble than taking up the soil without burning. If, however, he were to take it up without burning, his plan would be to bury the turf; and, when he wanted a fresh stimulus, to bring it into action (*Hear*). Their Chairman had made allusion to ashes being carted off, and applied to other lands. He had tried this himself. He had made a practice of drilling them into mangold-wurzel, but he had been disappointed. He had not seen that benefit from their application which he expected. On one occasion, when his men were at work in this way, he had said to them, "Now, miss some of the land, without telling me which it is;" and he could never discover any difference between the places where the ashes had been, and where they had not (*Hear*).

The CHAIRMAN: You admit they do good on the lands upon which they are burnt?

Mr. GRAY: Oh, yes, I admit that; but that is what I do not understand.

The CHAIRMAN: Did you apply them to any considerable extent?

Mr. GRAY: No; to no great extent; but I think I put them in thick enough.

Mr. BROWN (to Mr. Gray): How many crops did you say you had in succession?

Mr. GRAY: Thirteen crops in thirteen years.

The CHAIRMAN: That was upon land which had not been burnt?

Mr. GRAY: Yes.

The CHAIRMAN: That is most important (*hear, hear*). Was any part of the field burnt at the same time?

Mr. GRAY: No.

A MEMBER of the Club: Did you not use any manure at all?

Mr. GRAY: Not a skuttle-full: and my friend Mr. Wood has been over the ground.

Mr. WOOD: I can bear testimony to the fact of its being capital land; there is a great depth of soil (*Hear, hear*).

Mr. F. HOBBS said that perhaps his friend Mr. Gray having managed the land in question as a land-agent, it was hardly a fair criterion.

Mr. GRAY said, he could assure Mr. Hobbs that the farm to which he alluded was conducted strictly on tenant principles (*Hear*).

Mr. F. HOBBS said he was happy to hear that in Mr. Gray's part of the country the tenants had those rights and liberties which they certainly did not enjoy elsewhere. He said that he had eleven corn crops in thirteen years, and he (Mr. Hobbs) could not help thinking that he had acted upon a feeling which was far too prevalent, namely, that of breaking up the grass land, taking out all the qualities, and bringing it into a sterile condition. It was becoming by far too much the practice throughout the country to break up the pasture lands, apply the "whip," and exhaust all its good qualities, without putting any thing upon it. He was not aware, until he came into the room this evening, that the subject before them was to be discussed, otherwise he might have prepared himself to offer a few observations upon it. He did, however, think that grass lands were very much mismanaged: he was of opinion that one-third might be very advantageously broken up, and the other two-thirds would produce more beef and mutton than they did now. The inferior grass land would, no doubt, if broken up by a system of corn-cropping, produce as much beef and mutton as they did at present, and produce also considerable quantities of corn. If they took the average, if they took a farm of 200 acres, and 100 were kept in grass, and the other 100 under rotations of cropping, there would be more beef and mutton produced than at present, and corn at the same time, which must be advantageous to the neighbourhood, not only by the production of corn, but by the increase of employment

for the labourer (*Hear, hear*). This was a subject which he did think demanded greater attention from the general body of the farmers than it had met with for some years past. He felt satisfied that there was scarcely an acre of grass land which might not be materially improved by draining or manuring; or, if it was of decidedly inferior quality, why then let it be broken up. The system of soiling also, he thought, if more generally carried out, would be very advantageous. He (Mr. Hobbs) had, for some years past, managed a grass land farm of considerable extent, on which the land was of poor quality; indeed a great portion of it was formerly wood land. The soil was of a very tenacious character, and contained a good deal of oxide of iron, and, in some places, consisted of gravel and peat, with a good deal of water. Now he had no hesitation in saying, with respect to this land, that if the landlord would have allowed him to break it up, he could have afforded to give him double rent, and to have employed a double number of labourers, to the great advantage of the neighbourhood (*Hear, hear*). This was not by any means a singular case; for in many parts of England there was a great deal of grass land which the landlords compelled to be kept down under grass, because old grass land was looked upon with favour, and the landlord liked to see that kind of land (*Hear*).

Mr. MERTON begged to interrupt Mr. Hobbs for one moment, to ask him what he meant by "soiling," to which he had just referred?

Mr. HOBBS said, "soiling" was mowing off the green crops and feeding the cattle in sheds. Now with regard to paring and burning, he would say a few words. He had been in the habit for many years past of paring the borders of fields, or in fact any grass land, where he had the opportunity of breaking it up. Upon tenacious soils he found burning very advantageous, and he was one of those who thought it was rather a fault to burn the sods too rapidly. He thought they were too apt to select dry weather for the purpose, and place the heaps in the corner of a field, for the sake of cheap burning, and thereby got rid of the carbonic acid gas, which, as their Chairman had told them, was the most valuable portion of the manure. He (Mr. Hobbs) last year broke up a pasture which had a great portion of sand upon it—a silicious soil, which there was great difficulty in burning; but he persevered, and burnt most of it. He, however, left a small portion in the middle of the field, which he did not burn (it was late in the spring), and sowed it all with rape. Now the produce of those portions which had had the ashes upon it was at least three times as great as that part which had not (*Hear, hear*). He felt persuaded that although there was a feeling against the system of burning, more especially among the landlords than among the tenants, the existence of the prejudice was attributable to the plan often adopted of forcing great crops (the "whipping" system), rather than to any real injury which could be done to the soil (*Hear, hear*). This appeared to be certain, that upon tenacious soils burning was unquestionably advantageous; while

upon light soils it required care and caution in resorting to it (*Hear*). If they did not like burning, however, then it was a good plan to mix lime with the soil, which promoted the decomposition of the vegetable matter which it contained. In the west of England, within the last two or three years, they had adopted the system of charring the earth. Mr. Miles, M.P. for Somerset, had told him (Mr. Hobbs) that they had been in the habit of burning the soil in that county, and had not found it beneficial, and that therefore they had latterly adopted the plan of charring in preference, and that it had been found advantageous in the case of turnips and other crops also. As far as regarded the insects, however, it was unquestionably much safer to burn the soil than to wait for the process of decomposition. Mr. Gray had mentioned that he had used ashes with root crops without finding any benefit from them; but he (Mr. Hobbs) could only tell them that he had last year bought a considerable quantity of manure—guano, and other fertilizers—and in two instances, with turnips and carrots, he had derived as much benefit from ashes as from a much more costly amount of the best guano (*Hear*). Although Mr. Gray might be right in his opinion with regard to his own land, he (Mr. Hobbs) was of opinion that farmers generally knew so little of the effects of these fertilizers that they would be applied to root crops; although ashes would be quite as beneficial as guano or other manure. The subject, however, was one of considerable importance, and which ought to be looked into by landlords, as it would lead to an increased production of the land, an increased demand of labour, and, in many instances, an increase also of rental (*Hear*).

Mr. MERTON wished to know what Mr. Hobbs meant by the "borders" of fields; he had spoken of burning the "borders" of fields. In his (Mr. Merton's) county they knew no such thing as a border to a field (*Hear, and a laugh*).

Mr. HOBBS said, when he took his farm there were a great many borders to the fields, which had been left for the encouragement of the game (the landlord was very fond of game), and these he took the opportunity of burning. He was not allowed to pare and burn the grass lands generally, of which he had 240 acres, but every inch of border he had broken up and burnt, and found great advantage from so doing. He did not, however, mean, when he talked of borders to fields, that that was the character of the land in the county of Essex generally (*Hear, and laughter*).

Mr. AITCHESON said he had come here this evening expecting to hear a lecture upon the advantages of the system of raising artificial grasses in comparison with old pasture lands, but he felt very much obliged to their excellent chairman for what he had given them instead (*cheers*). He was quite satisfied that much was to be done in the way of converting grass lands. He was sorry to see that in the county of Sussex and in the Weald of Kent, the very sink of farming (*a laugh*), the system was not adopted. Throughout Sussex two systems of pasture-land prevailed, which

perhaps might appear odd. In one case, the land was covered with coarse grass, blackthorn, and rushes, and had never had a single handful of manure upon it, nor even surface draining applied to it. He was quite satisfied that with proper management one-sixth of the whole county might be recovered. In many cases ten acres did not produce more than eight acres ought to produce; and there were parts where the roughest cattle could not go, and where they must be all but starved. Now, if such land were double furrowed, ploughed, or pared and burnt, and then laid down with peas or beans, the next year receiving a good dressing of lime, they might then have very good crops of wheat upon it (*Hear*); and if they pleased to keep it only two or three years, it might be laid down again with good grass. Under the present system one-sixth of the county at least was out of cultivation. The other description of pasture lands consisted of meadows and home meadows, which were mowed every year—a most objectionable system. If the whole of the coarse lands were ploughed up, and cropped one year and mowed another, there might be one-third more corn grown for the use of man, and double the quantity of beef and mutton in addition (*Hear*). He thought it was a great pity the landlords could not be induced to break up all these old pasture lands (*Hear*). If that matter could be introduced into the code regulating tenant-rights, he thought it would be very desirable. Let the tenant have leave to do as he liked with them. If he thought proper to break them up, let him do so. He thought there had been some misunderstanding between Mr. Shaw and Mr. Baker regarding their ideas on the subject of paring and burning, and he thought that it arose in this way; namely, that there had not been sufficient explanation as to what was growing on the land at the time of resorting to the process. He quite agreed with the remarks of the Chairman with regard to stiff clays; and as to the question between large or small heaps, for his own part he rather preferred the small heaps, but still he thought it was necessary to know what was growing on the land at the time. Now, in the case of the Mendip Hills, which he believed were very woody, he thought the burning might be very beneficial, because the wood ashes, with the turf, would produce the effect desired (*Hear*). He repeated his approval of the plan of converting grass lands into tillage, and concluded by saying that the present system was not only starving man by depriving him of labour, but was also starving the very beasts (*Hear*).

The CHAIRMAN said, in opening this question he had been desirous of confining himself to the letter of the card; but as other matters had been introduced into the discussion, he would just mention what he particularly alluded to with respect to burning lands. Some of the fields of Essex, which were of white marl clay, scarcely produced an atom of grass. Now it was impossible to burn this in small heaps, as there was no vegetable matter to keep the fire going, and it required a great deal of fire and very large heaps to start it at all. The men were, however, very clever in the management of them, and by

stopping in the smoke from time to time wherever it appeared, they continued to burn until perfectly red, and the ashes were applied to the soil of other fields quite as lime would be applied. The point they were upon, however, was the conversion of grass lands into tillages. With regard to the question of burning in large or small heaps, his own argument, as he had already said, was that the waste was less in large than in small ones, and thereby the carbonic acid gas was retained which would otherwise fly off. That was his argument. As to burning on light lands, he took that upon opinion. Whether it was advantageous or not, he thought was questionable: their friend, Mr. Shaw, said it was so, and he (the Chairman) took it for granted. The general opinion, however, in Essex was that it did not answer, and there it was not attempted (*Hear*). But whether when they got upon light soils of a different character the matter became a different question, was doubtful; it might be that it was so. The soil to which Mr. Shaw had made allusion rested on limestone. Chalk clearly became converted into lime, and it was just as easy to convert marl into lime as it was chalk. Then it had an affinity for carbon, and was a very beneficial vehicle in cultivation. They had met there for the purpose of investigating a certain question, and whether there was any better mode of effecting a certain object than at present existed; and therefore it was desirable to hear various opinions and the various results of experience (*Hear, hear*). Lime had an affinity for carbonic acid gas, which it took up from the atmosphere; gypsum had an affinity for ammonia, and therefore was used in mixing manures. Lime was a very material thing in agriculture; carbonic acid appeared to be the very essence of vegetable life; and by the application of lime to the soil, this gas became mixed with the soil. It was upon this principle that lime produced by its agency the beneficial effects which it did. In all those lands which contained oxide of iron, they would get the red colour by burning; but upon other lands they would not. In burning peat, for instance, they never get the redness, but merely a white ash. Therefore was it that they could not apply one general principle to the whole country, and therefore also was it that they derived so much advantage from meeting together from all the various parts of agricultural England (*Hear*). Mr. Shaw told them that on the Mendip Hills they burnt even the light soils; now if they had a practical man from that locality, he would probably tell them why they did so there and why not in Essex (*Hear*). He begged, however, to remind the meeting that it was desirable that they should come to some resolution as the result of their discussion (*Hear*).

Mr. SHAW said he had only one more remark to offer before they did so. Their worthy chairman was a much better chemist than he was, and therefore he felt that he could hardly venture to dispute a point with him which depended on chemical knowledge. But it did appear to him that burning in large heaps, and reducing the soil to a red ash, was inconsistent with retaining the carbonic acid; indeed, he held that the very act of burning to a red ash destroyed the carbon.

Mr. BROWN said he would take the opportunity of offering a few remarks on the question under discussion, although he could hardly hope to throw much light on the matter. The question before them was, "the best mode of converting grass land into tillage." He (Mr. Brown) knew but three methods of doing this. One, and the most general, was that of paring and burning: another, that of ploughing without paring and burning, and allowing the land to lie; that was to say, ploughing in November, and letting the land lie until the next March or April, and then have a crop of oats drilled in, which would give time for the turf to rot. The third mode was that of paring and throwing the turf in, which rotted and eventually came up again, and was very beneficial to succeeding crops. He had himself been a great advocate for burning in the case of inferior grass lands which were not cultivated; and since the tithe commission had been appointed, there was great encouragement for so doing (*Hear, hear*). Previously, land which paid sixpence an acre used, when brought into cultivation, to be subject to six or seven shillings an acre tithe (*Hear*). This was a great obstacle. It was quite evident that there was not sufficient land in tillage; the number of acres per able-bodied man was very deficient. In his county (Wilts) they had that immense plain—Salisbury Plain; and since the appointment of the tithe commutation commissioners, a great deal of it had been brought into cultivation. They had several farmers now farming in that district of the county, who had broken up the land, were keeping stock, and also growing a great number of acres of corn; and, moreover, were giving employment to a great number of additional hands—a part of the matter not the least worthy of consideration (*Hear, hear*). He was aware that in this question of breaking up land, very much depended upon what was going to be done with it. He had often been applied to by tenants to solicit the landlord to give them permission to break up certain lands, and had always said, "Give me some idea how you are going to manage the land after it is broken up, and then I shall be in a position to go to the landlord, and if I can assure him that his farm is not going to be injured by it, well and good; but I cannot recommend him to give you such permission if I think that it is" (*Hear, hear*). He (Mr. Brown) was of opinion that we should never have two crops of corn without green crops between. Some short time ago he paid a visit to the neighbourhood of Aberdeen, where the farming was generally considered of a first rate character. They were at the time breaking up some land, and he was surprised to observe that they were using an immensely strong plough, and tearing up the heath and all together. He should have considered that the proper way to go to work was to commence by burning this heath; and he spoke to the man who was at work with the plough, and asked him when he expected the heath to rot? His reply was, "Oh, it may be two or three years before it becomes thoroughly decomposed" (*a laugh*).

Mr. FISHER HOBBS presumed that this person was not a member of the Highland Society (*Hear, and laughter*).

Mr. BROWN: No; he certainly was not a member of the Highland Society. In the Carse of Gowrie he certainly saw some very fine farming, and some of the most magnificent turnips he ever beheld. With regard to the question of burning land there appeared to be great difference of opinion; he would not take upon himself to say which was the best mode. Perhaps the nature of the soil itself might, to a considerable extent, determine that point. In his county they decidedly preferred the small heaps. But the more the smoke could be kept in, the more they were kept in a smouldering condition, and the less they were allowed to break into a flame, the more advantageous it would be (*Hear, hear*). There might, however, be situations where large heaps were more desirable.

Mr. WOOD said he should have risen earlier in the evening if the subject had come within his knowledge of farming; but his actual experience of breaking up grass-lands and converting them into tillage was very limited; and had it not been for some remarks made by Mr. Aitchison, he should altogether have avoided exposing his ignorance (*laughter*). That gentleman stated that the land in Sussex might be made to produce much more than it did; but the reason why it was not brought to such an extent of cultivation as other counties were, was that there were great difficulties in the way, and great burthens attending it. In the first state of humanity man was wild; in the next he led a pastoral life; and in the third he became an agriculturist (*laughter*). Now, in Sussex, they had not got beyond the second state—in fact, they were only shepherds (*renewed laughter*). He was afraid that, in consequence of the burthens on land, this was the case in many other parts of England also, and that no sooner was one burthen removed than another was supplied by their Legislative enactments to stand in the way of the progress of cultivation (*Hear*). Mr. Hobbs had remarked that, if he had been allowed to break up his land, he could have afforded to pay double rent, and could have cultivated much more. But he (Mr. Wood) thought that, if he considered the burthens of tithe, and so forth, he would come to the conclusion that it would not have been altogether so profitable; and he had too good an opinion of Mr. Hobbs's judgment to think that he would do anything that would not be profitable. When the times should enable him to break up his pasture lands—and he held considerably more of that than of arable—he should certainly, from what he had heard to-night, adopt the system of paring and burning, as he understood that to be the most judicious (*Hear, hear*).

Mr. HOBBS said, as his friend Mr. Wood had alluded to him, he intended to reply. He was sorry—as that gentleman never came to this Club without “getting a wrinkle” (*a laugh*), which he had more than once admitted—that they had not been able to enlighten him on the subject of converting grass-lands into arable. He stated his opinion with regard to his (Mr. Hobbs's) grass-lands, that it would not have answered his purpose to have broken them up when he took the farm; now, he firmly believed that it would have answered his purpose to have given 10s. an acre more for it, if he could have

broken it up, than it did at the present rent, keeping it under grass management (*Hear*). He (Mr. Hobbs) did not think that the burthens on land were sufficient to prevent the tenant-farmer from converting grass-lands into arable. The growth of corn was the most profitable purpose to which they could apply lands; and he did think that, in a very few years, most of the grass-land would be converted into tillage. He last year had an old pasture, which for a number of years had been scarcely producing anything; it happened to come into his possession, and he determined upon making it do something. He sent for a person out of Cambridgeshire, who was in the habit of paring and burning, and who agreed to breast-plough, pare, and burn it for 30s. an acre. After proceeding to a considerable extent, he found that there was a great deal of sand in it, and he asked 5s. an acre more, which he (Mr. Hobbs) gave him. He thought there was little grass-land which might not be converted into tillage for from 30s. to 40s. an acre, and therefore he did not think Mr. Wood's argument bore upon the question. He did firmly believe that the increased production which must take place if the grass-lands were brought into cultivation, would have a great effect upon the feelings of the country, more especially upon the subject which had been so much agitated lately. There were numbers of bogs and pieces of wet land bordering brooks and rivers, producing nothing but rushes and coarse grass which was almost valueless; in very many farms there were large portions of such land which might be under-drained, or the water got rid of by one or two large drains properly applied. He (Mr. Hobbs) had lately drained a bog which no one in the memory of man had walked over, and from which cattle had frequently been dragged out; there was very good snipe shooting, but it was of no other use. Well, by converting it into arable land he had made that which previously had not been worth 5s. an acre worth 30s. an acre (*cheers*); and no doubt much such land might be advantageously broken up at the expense of a few pounds (*Hear, hear*).

A short but animated discussion then ensued as to the form of the resolution which should be adopted.

Mr. Shaw ultimately moved, and Mr. Hobbs seconded, the following:—

“That the arguments adduced at this discussion lead to the conclusion that many descriptions of grass land will be best brought into cultivation by the system of paring and burning, provided root crops be first taken; but that upon richer soils it is doubtful whether the object may not be effected by the ordinary method of cultivation.”

The Chairman having put the resolution, it was carried unanimously, and the meeting separated.

ON TENANT RIGHT.

A committee of the London Farmers' Club are now forming a code of laws for protecting the industry and capital of the English farmer.

My advice to the Provincial clubs is—bestir them-

selves and express their sentiments openly, through the advantages of the press, whose assistance is always available to remedy public grievances. Such important matters are not left, as formerly, to the adjudication of a few landlords; no, they are settled by a discerning public, and the more they are enlightened on the subject, the more disgusted they are with the system.

The public will not be surprised at the price of beef and mutton, and the great importation of corn required, when they understand how the tenant farmer is bound down by the laws of landlordism.

I will state a most cruel and heart-rending case that has recently come under my knowledge. A tenant has occupied a farm about forty years; he has constantly expended his surplus capital in bones, linseed, cake, &c., not only to increase the quantity of corn, but also his green crops, which are returned to the land in the shape of manure. His landlord a short time ago had the modesty (or, as Mr. Mechi denominates it, a desire to appropriate the tenant's capital to his own use) by claiming the manure: the tenant not being a man with much energy and spirit, coolly submitted to the unjust demand, not thinking that the most trifling unforeseen casualty would deprive him of his forty years' hard toil.

Lastly he dies, and what is the consequence? his wife and family are unable to manage the farm, and instead of having four or five hundred pounds to receive for manure, produced at their own cost, which would greatly assist in bringing up the family, she quits without a shilling for it; and who reaps the benefit? The modest landlord.

I am prepared to prove before Lords, Commons, or any committee, *by men of intelligence, perseverance, and capital*, that they could and would produce more beef, mutton, and corn, consequently more labour, under a proper and just system of tenure.

What say intelligent men before they expend their capital? My landlord's agreement compels me to make good all dilapidations, but it does not compel him to pay for manures and improvements carried out at my cost; that is another thing.

Are such iniquitous laws to be tolerated in the nineteenth century, because they were enacted by the landlords to suit their special purpose, to the serious injury of the tenant farmer, and a loss to the whole community?

A SUFFERER UNDER THE
LAWS OF LANDLORDISM.

PLEURO-PNEUMONIA; OR, EPIDEMIC AMONG CATTLE.

SIR,—Having had a six months' visit of this fatal disease among my cattle, and consequently got a little experienced in its first symptoms, progress, and results, I think it my duty to my brother farmers and the country generally, to add my mite to what has already been published regarding this most fatal epidemic.

Having had some young stock grazing at a distance of three or four miles from my farm last summer, I was informed by the park-keeper about the beginning of August that one of my cattle was not feeding so well as usual; and on examining it, I found its coat staring a little, and that it had a slight low cough; and as the weather had been very wet for some time, thought it had got a bad cold, and that it would be advisable to take it home, where I might have it better attended to; consequently, it was sent for and put in a dry shed by itself, and I am not aware that any of the other cattle about the place ever saw it or was near it. I then had it bled and physicked; and as it was eating a little grass, thought it would soon get better. On the next day, as the fever was very strong and the physic had operated, I took some more blood, and had still good hopes of its recovery. However, by the third day it had again got very costive, the excrement being very black and fetid, and the pulse beating 112. I began to lose hope of it, but gave another dose of physic (Epsom salts and ginger), which again operated, but without producing any abatement of fever; as I could not think of taking any more blood, and as it had not eaten anything for two days, I fed it with oatmeal gruel until the sixth day,

when it died. On opening it, I found the lungs about twice the usual size, the left being much the largest, and both gorged with blood as black as pitch, and quite in a state of corruption; the pleura also very much inflamed, and adhering to the lining at the sides in a great many places, and the chest filled with water; the heart, liver, and bowels all appeared entire; and being satisfied that it was some incurable disease, had the skin taken off, and the carcass burned: and as it was but a year old stirk, I gave myself little more concern about it; but having heard that two cattle died in the adjoining field where it was, I kept a strict watch over the rest, but never saw anything the matter with them.

Well, in four weeks after, I noticed one of my cows a little dry, and staring in the coat, and not feeding as usual; and on observing her stools, state of her pulse, and her general appearance, soon perceived she was in for the same disease; and as she was in faint condition, and being convinced of the incurable nature of the disease, had her sold to a flesher without delay; and eight days after, her neighbour in the stall exhibiting symptoms of the same malady, gave me ample proof that I had got not only a fatal but a most contagious disease, and that disease is pleuro-pneumonia.

On consulting the "Treatise on Cattle," by the Society for the Diffusion of Useful Knowledge, I found it strongly recommended as a good preventive, in cases of diseases of a contagious nature, to bleed and physic the sound animals, which I immediately did; but, notwithstanding, I have lost ten, seven of which have been

buried, not having been in condition to kill. Now, Sir, to give all the information in my power regarding a remedy for the disease, I have to state that, in five out of the ten cases, I did everything that was suggested to me from books on the subject, and from practical veterinarians; and am sorry to say that in all of them I was unsuccessful, and am of opinion that, after the disease is fairly established, it is incurable. I bled, blistered, physicked, setoned, and rowelled; and, although for a time they all had their effects, these have hitherto all failed to effect a cure, and the disease has, from four to eight days after its apparent commencement, ended in death. Bnt, notwithstanding that my feeble endeavours have failed, there is no reason for despairing of a remedy: some one may be more fortunate than I have been; and I hope whoever succeeds will make it known. If my experience can be turned to any account in the way of prevention, I may mention that the very first symptom of the disease is looseness—that, while all the beasts are on the same keep, one will be observed uncommonly loose, which will continue for two or three days, and be very black; then he will get bound very rapidly, and his hair will begin to become very dry and erect; the animal will cease licking himself, preferring to lie down, and, if in the fields, separate himself from the rest of the herd whilst grazing, but eating very little himself; in winter time, although supplied with turnips, he prefers feeding off a little straw, and will continue to chew the cud after he has entirely left off eating; his belly, which has hitherto been nearly as full and healthy-looking as usual, will now begin to collapse; his head will be somewhat extended, but his eyes, beyond assuming a more than usual brightness, have nothing very remarkable about them; about a week after the looseness has appeared, he will be troubled with a low and not very frequent cough, which, though almost inaudible, will irritate his chest, causing it to rise as if with pain, and, if you observe that cough more than once, in all probability your chest will rise in a like manner; you will next observe a grunt in his breathing, especially when lying, a catch in every expiration, which will soon become constant even while standing, and all the medicines I could administer had no effect in removing it, and the longer it continued the louder it grew, until death put a period to it; if you press your hand to the right side, behind the fore-leg, you will feel the heart beating very strongly, between 100 and 130 a minute.

Now, although I have never effected a cure where the disease was fairly begun, yet I think, by employing preventives, they have been the means of saving one or two. In going over all my stock with medicines, I observed two rather loose, but gave them the same treatment as the rest; but, while it had very little apparent effect on the greatest portion of them, farther than diminishing their appetites for half a day, these two became very ill in a few hours, and one of them was so very weak, that it was unable to stand up or to eat anything for a week, and was fed solely on linseed-tea and gruel, put over his throat, when he got stronger, and ate, for six weeks, about as much as two would require, when he relapsed, took the disease, and died. The other was not

so ill; he always kept eating a little, but got very much tucked up; but, as I nursed him with three bottles of linseed-tea a day, with sliced turnips and hay, he quite recovered, and is still doing well.

Now, it may perhaps be of importance to any person who may be visited by this unwelcome stranger to know what medicines to give for prevention; and I may mention that, after taking half-a-gallon of blood from cattle more than a year old, I gave, on the morning after, on an empty stomach, 1lb. Epsom salts, 1 oz. ginger, 1 oz. nitre, 1½ dralim tartarized antimony, and 1 oz. salt of tartar, which can all be got from any respectable druggist; after mixing well together, to be given in 1½ chopin thin gruel, with ½lb. treacle, which will be found, in almost every case, to operate in two hours. In frosty weather they require to be kept in a warm place, being plentifully supplied with lukewarm water after the medicine, and then only a little straw for the rest of the day. Young beasts, under a year old, will not stand quite half the former dose—say 5 oz. salts, 3 drachms ginger, 3 ditto nitre, ½ ditto tartarized antimony, and 2 ditto salt of tartar. I would advise every man, whose stock is afflicted with the epidemic, to lose no time in thus treating every beast of the cattle kind about his place: I can guarantee it will not hurt them, but, on the contrary, it will repay all his outlay, which is about 1s. per head, and all his trouble in the fresh growth it will put into his stock. Should the disease still linger about the place, I would recommend a strict observation, and, whenever an animal is suspected of having it, remove it from the rest as soon and as far as possible, and keeping it separate; a day or two will show whether it is the epidemic or not. One test I have never found to fail: when attacked, they will never be heard to cry, although separated from the rest, even in its early stages. As soon as it is fully proved to be the fact, have him either sold, if at all in condition, or put him under ground as soon as possible; clean the place where he was recently kept, well washing it with lime-and-water, and, after a space of three months, bleed all the stock again.

Now, sir, if these observations will not occupy too much space in your columns, I may perhaps be allowed to make a few remarks on the origin of the epidemic, and suggest a way to get rid of it.

It is a disease of recent date in this country: you will find it about as old as the introduction of foreign cattle: you will find a disease called *chronic pleuro-pneumonia* mentioned by M. Lecoq, teacher of the Veterinary School at Lyons, which was very prevalent on the continent in 1833, and originated in Franche Comté, where the cattle are worked, and then driven long journeys to market, in want both of food and water, and, being naturally subject to diseases of the chest, a great many fell victims to this fatal disease by the way; and, as the same breeds of cattle exist, and the same methods of working and driving are still customary, we can have very little doubt but the same diseases exist likewise; and as the importation of these cattle is greatly on the increase, and, under the proposed alteration, will go on at an immense rate to increase, so we may expect pleuro-pneumonia to increase in a like ratio. Besides those

which have already fallen victims to it out of my small stock, I could mention twelve or fourteen farmers and cowkeepers in this immediate neighbourhood who have suffered much heavier losses from the disease than I have; and no one is safe in buying cattle in a public market. If its ravages continue to spread as they have been doing hitherto, it will furnish a reason to Sir Robert Peel why the price of cattle is getting still higher in the face of so many importations, and may well make him pause before admitting so many more as may be expected if they are admitted duty-free.

No one at all versed in the annals of this country can forget the sad consequence of the continental murrain of 1745, when hundreds of thousands of cattle were swept away, and government found it imperative to order every diseased beast to be killed, and gave remuneration to the owners, when no fewer than 80,000 cattle were killed, besides what died of the disease. In my humble opinion, the disease now prevalent is one of an equally malignant character, and unless, under the good providence of God, we get rid of it by some means, every one concerned for the good of his country must feel alarmed to think that it may again be laid waste by its fatal ravages; and thousands have to live on the carcasses of diseased animals without knowing of it, instead of the wholesome food we have been so long accustomed to in this country.

Now, as the admission of foreign cattle duty-free is to be brought before the House some of these weeks, I would humbly suggest, as a means of putting a stop to its future introduction from the continent, that petitions be got up all over the country to bring in a clause in the bill, "That no foreign cattle be allowed to be landed in any port of Great Britain or Ireland without lying in quarantine for thirty days, and then undergoing a most minute inspection by qualified persons appointed by the government; and, in the event of any cases of pleuro-pneumonia occurring either on the passage or under quarantine, to be subjected to either 30 days, or be sent back where they came from, at the option of the owner;" as the disease, in all cases that have come under my notice, will be apparent in about 30 days after contagion; and thus, although we may have to fight against what we have got of it, we may escape the consequences of its further introduction.

Hoping that these remarks will be thought worthy a place in your widely-circulated columns, and that they may be the means of arousing my fellow-countrymen to a sense of the danger of allowing the spread of so formidable a disease to continue,

I am, sir, your obedient servant,

A PERTSHIRE FARMER.

NOTES ON THE MANAGEMENT OF SHEEP,

FOUNDED UPON REPORTS OF COMPETITORS WHO GAINED PREMIUMS AT THE WOOL
COMPETITION HELD AT EDINBURGH IN 1845.

Cheviot Sheep.—Mr. Anderson, Sandhope Selkirk.—The flock consists of about 1000 ewes, of ages varying from one to six years; and it was reared exclusively on coarse hill pasture, elevated from 1,000 to 2,000 feet above the level of the sea. The stock ewes get no artificial food, except on the occasion of a severe storm, when they are supplied with a little natural hay. To afford such aid, unless urgently required, would tend to lessen the exertion of the sheep to provide for themselves. The tups are bred from selected ewes by the best rams, and put on grass and turnips during winter and spring. The washing takes place about the end of June in a pond, into which the sheep are made to leap from a platform raised about two feet above the surface of the water, and then caused to swim twice or oftener across, as may be necessary for cleansing them. The clipping is performed about eight days after. The animals are laid on a stool, the operator proceeding length-ways in parallel lines an inch in breadth, and making the cuts as low and smooth as possible. The price obtained for the clip of Cheviot wool in 1845 was 28s. 6d. per stone of 24lbs., and for the black-faced clip, 13s. per stone. Wethers are not kept; but barren ewes, sold from the hill pasture at the end of

autumn, weigh about 13lbs. per quarter. The average weight of a Cheviot fleece is 3lbs. 7 oz., and of a black-faced, 4lbs. The black-faced flock, containing 600 breeding ewes, is similarly managed.

Mr. Gentle, Dell, Inverness.—The flock, in which there are 500 shearling ewes, is washed about the 18th June. The sheep are driven three times through an arm of a fresh-water lake, having to leap into the water from a breastwork four feet high, and to swim from thirty to forty yards. The clipping follows about the 22nd of the same month. It is done longitudinally, with an even and rather bare cut. The clipper is seated on a smearing-stool, which is covered with a tough sod, to prevent the animals being hurt. The pasture consists of common mountain grasses, much intermixed with heather, and its altitude varies from 1,000 to 2,000 feet above the sea. In winter and spring, however, the sheep, when the inclemency of the weather makes it necessary, are brought to lower ground, at an elevation not exceeding 100 feet. The clips of 1844 and 1845 were sold at 18s. per stone of 24lbs. Three-year old ewes have been sold for 25l. 10s. per score—a price considered less than their value. Such sheep, getting good turnip feeding till the end of March, would weigh, on an

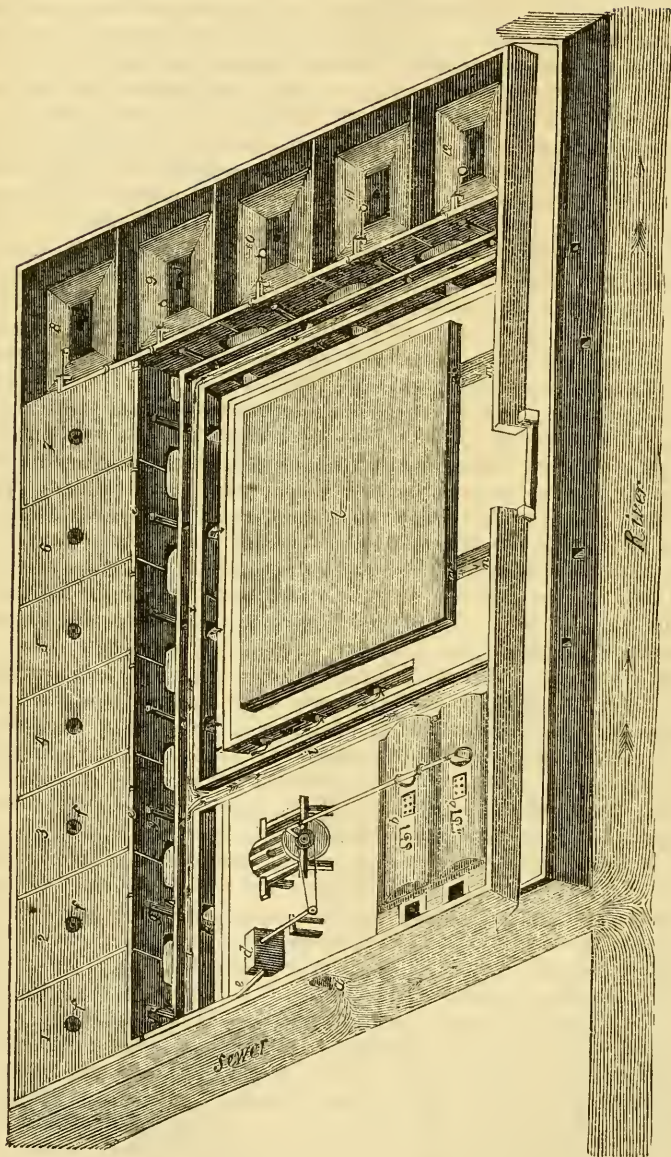
average, from 18 to 20lbs. per quarter; but individual sheep have weighed 25lbs. per quarter. The fleeces of the shearling ewes will be about 4lbs. weight each on an average; but, taking fleeces of all classes, the average per fleece will be about 5lbs. The fleeces are understood to consist of laid wool.

Mr. Tweedie, Deuchrie, Prestonkirk.—The flock contains from 300 to 400 shearlings. The sheep are washed in June by making them leap three or four times into a pool, and swim fifteen or twenty yards. They are generally clipped within a week after, the shears being used longitudinally. The pasturage is on the Lammermuirs, poor and mostly heath. In winter and spring, turnips and hill pasture are the means of support, each being afforded daily. The clip of hogg and ewe wool in 1845 sold at 29s. 6d. per stone of 24lbs. For the last five years, a bath mixture, prepared by Brown of Hadington, has been used in autumn; and, while it has kept the stock quite clean, it is easily applied. Three men to dip, and a boy to drive water, can easily bathe 600 or 800 sheep in a day. The apparatus is not very expensive, and it promotes the comfort both of men and sheep. It consists of a tub for dipping, and a large trough in which the sheep, after being dipped, stand to drip, and so constructed that the drippings run back into the tub. Since the adoption of this plan, the wool has always been considered very fine, and, indeed, the best shown at a local exhibition.

Black-faced Sheep.—Mr. Vere Irving, Newtown House, Moffat.—In the district of Moffat it is not customary to wash black-faced sheep. The shearling and barren ewes, and the rams, were, in 1845, clipped on the 2nd July, and the rest of the flock consisting of ewes rearing lambs, on the 19th of the same month. In 1844, the clipping of the latter class of stock took place some days earlier; but this is not considered advisable, as the wool last season was better risen than in the preceding year. In clipping black-faced sheep, the shears are run from head to tail, but, in the case of Cheviot sheep, they are directed over the shoulder and back. The latter method produces a neater clip; but the former is more expeditious. The farm rises from a base of 910 feet above the level of the sea, to an altitude of 1550 feet above it. The lower portion, which is divided into parks, and is well sheltered, is occupied with dairy-stock, grain, green-crop and hay; and, for the greater part of the year, the sheep are entirely confined to the upper division, or steep-ground. The pasture is short and of a bright colour, intermixed with coarse bent, which requires to be burnt in spring. Some years ago, part of the benty ground was ploughed, heavily limed, and sown with grass-seed; and thus a great improvement was effected,

the bent having been replaced by a bright green pasturage, which cannot be distinguished from those portions of the ground that are not naturally covered with bent. In winter and spring, the sheep, if their condition seems to demand it, are admitted into such of the lower parks as have been cut for hay, or pastured during the summer by the dairy-stock, which is then fed in the house. The sheep are let down from the higher ground in the morning, but are invariably put out of the parks between one and two o'clock in the afternoon. In the event of a severe snow-storm, they are fed with meadow hay, which is carried out to them. In weaning the ewe lambs intended for stock, they are put into one of the parks for a week, and then allowed to return to their mothers, whom they recognise, but no longer attempt to suck. An advantage of this plan is, that the lambs follow their dams through the winter, and, if there is snow, they are helped by them to scrape, so that they do not so often need to be fed with hay as when they are kept separate all the winter. The last clip sold fetched 12s. per stone of 24lbs., for fleeces of all denominations.

Cross between Cheviot and Leicester Sheep.—Mr. Brown, Halls, Dunbar.—In the flock there are about 600 hogs. The usual period for washing is about the end of May or beginning of June; and the plan followed is that of placing four or five men in a stream of clear water up to their middle, one above the other, and passing the sheep, one by one, from the lowest to the highest, each man, in turn, plunging the animal in the water. The shearing follows in three or four days, when the natural oiliness of the wool, extracted by the washing, is restored. The operation is performed in an open shed, laid with green sods. One or two women attend for the purpose of freeing the fleeces from particles of clotted wool, and afterwards winding them. The price obtained for the clip last sold was 31s. per stone of 24lbs. The pasture on which the Cheviot ewes are grazed, from which the half-bred lambs are reared, is situated on the northern boundary of the Lammermuirs. The lambs are weaned about the middle of August, when they are removed to the sown pastures on the farm. In November they are bathed with a mixture of tobacco liquor and spirit of tar, in the proportion of half a Scotch pint of the former to a wine-glassful of the latter for each sheep. They have then a few turnips laid on their pasture, and, when they have fully acquired a taste for them, they are folded on turnips alone during winter and spring, or until grass is ready for them, which, on the high situation to which they are transferred, is, in ordinary seasons, about the middle of April, or beginning of May.—Journal of Agriculture.



CONVERSION OF THE CONTENTS OF THE LONDON SEWERS INTO MANURE.

CONVERSION OF THE CONTENTS OF THE LONDON SEWERS INTO MANURE.

The drawing on the other side represents a plan of the works proposed to be erected by Mr. M. Joscelyn Cooke, for the conversion of the water of the London sewers into manure.

Mr. Cooke proposes to establish works as near as possible to the mouths or embouchures of all the large sewers in London, and then to allow the water out of such sewers to run into one or more main receiving tanks; afterwards to pump it from these tanks into a series of smaller ones; and then, when in them, to treat it with a very cheap chemical agent known at present only to himself, which will instantaneously precipitate all the valuable and offensive products from the water to the bottom of the tanks, leaving the top water clear and free from smell. The top water in these tanks is then allowed to run into the Thames, whilst the thick matter that remains at the bottom is conveyed away into another large tank, and from thence into lighters covered over and built into water-tight compartments, and by these it is to be carried away either up or down the river Thames, to be dried at any suitable place, or to be taken at once and laid upon the land to be manured. The whole of the works are so arranged that the sewer water is never open to the atmospheric air, and therefore all smell is prevented. A description of the drawing will perhaps give a clearer view of the plan. The sewer is shown open, but it is intended to be closed in the works. A represents an arched drain, communicating with the sewer, through which the sewer water passes to a large tank, which will contain two or three thousand gallons. This tank is supposed to be under the two boilers B B, and a steam engine C, and a pump D, and is arched over with brick work; the pump D, which is intended to be a rope-band pump, passes down into this tank, and is worked by the rotary engine C; this pump and engine are to be of greater or less power, according to the size of the sewer—forty-horse is, however, calculated as the power of the engine and pump. The sewer water when pumped up is passed by the pipe E round to the tanks numbered from 1 to 12. This pipe has branches with ball and stop-cocks in each tank, shown in tanks 8, 9, 10, 11 and 12, which tanks are shown open, and the other seven closed. These twelve tanks will hold each one thousand gallons or more if necessary; and the ball and stop-cocks are so arranged that as soon as one tank is full the cock stops the supply from the pipe E, and turns it into the next, and so on in rotation. As soon as these tanks are filled with sewer water, they

are treated with the chemical agent through the holes F; and immediately they are, all the thick matter is precipitated, and the top or supernatant water is cleared; this is then let off by the stop-cocks G into pipe H, which leads into the drains I, and so into the Thames. The thick precipitated matter is then let off by the valves J at the bottom of the tanks (see tanks 8, 9, 10, 11, and 12), and passes into the drain K, and so into the receiving tank L, capable of holding ten thousand gallons; and it thence passes on opening valves N N, by the pipes M M through flexible hose attached to the mouths thereof, into the covered lighters which are laid on the bank alongside the wharf to receive it at low water and removed at high. These lighters are then conveyed away, the thick stuff removed out of them, and dried in a suitable manner—also a secret; but we suppose either in the air, or by steam heat under sheds. Thus is the offensive matter of the sewers removed without entering the Thames, and without exposing it to the atmosphere, or occasioning any unpleasant smell to the neighbourhood where the works are. It would be supposed that a great number of lighters would be necessary to remove the thick stuff that remained from the precipitate in the tanks; such, however, is not the case, for Mr. Cooke has ascertained by experiment the quantity of thick or solid matter in the sewer water is very small in comparison with the liquid. He has sent us the result of an experiment he made on the sewer water taken from the sewer near Scotland Yard, which we give below; and he considers this is a fair average result. If this be correct—and we have every reason to believe it so—there is no question that the solid contents concentrated in the way he describes may be easily conveyed away in lighters, and that very few would be required for the purpose. We shall now give the experiment he made.

EXPERIMENT.

Sewer water taken from the sewer at the bottom of Northumberland-street, Strand, taken as running out, not scraped from the bottom, but taken as near the centre of the stream as could be in every respect, on a Tuesday in the morning, and not a water day. One wine bottle, appearance thick, rather muddy, but not black; smell very offensive, sulphuretted hydrogen predominating. Test with litmus paper, blue, slightly alkaline, measured out sixteen ounces, which were poured into a clear precipitating glass; treated it with two liquid drachms of my agent in half-drachms at a time;

first half-drachm produced sensible precipitate, but not complete; second do., more, not complete; third do., do.; fourth do., complete, and supernatant water clear. The smell of sulphuretted hydrogen had now ceased, and a peculiar one, not unlike the smell of turpentine, present. Stirred mixture up, the precipitate in flocks, dark grey, not unlike threads of over boiled beef. In ten minutes this subsided, and the supernatant water clear as before. Prepared filter weighed, and noted weight—filtered the sewer water, filtrate clear and sparkling after all had passed through—shook it up, sparkled much, evidently carbonic acid gas disengaged—poured filtrate into an evaporating basin, and evaporated to dryness, at 212—weighed, results 7 grains of brownish matter, which was deliquescent—treated this with sulphuric acid, result muriatic acid gas given off in great quantity, and slight black precipitate formed in small grains. Dried the filter used at 212 Fahr.; result, deducting weight of filter, 30 grains 25. From the quantity of muriatic acid gas given off from the dried result of filtrate, I was perfectly convinced the matter was principally muriate of soda, and I judge the other colouring matter to be a small quantity of oxide of iron. Upon these two my agent will not act. I did not carry the experiment further, as the quantity of matter remaining in the sewer water after being heated was so small—viz., 7 grains; and that giving such a quantity of muriatic acid gas when treated with the sulphuric acid, that I felt satisfied nearly the whole was muriate of soda, coloured by the oxide of iron. I should have tested for lime, but I know my agent precipitates it immediately, also potash, ammonia, alumina, and all the phosphates, and there was no smell or sign of uric acid, or any of its compounds. Samples of sewer water are very irregular in the quantity of matter they contain; no two samples I have ever experimented upon gave the same result. If taken on a rainy day, or after rain, or on a water-day, the quantity of solid matter it contains is very small, and it differs if taken in the morning and the evening. To correctly ascertain what matter it does contain, samples should be taken at every half hour of the day, and an average of the results taken. I consider the sample I have given very near an average result of the running water; if, however, you scrape the bottom of the sewer, you may obtain thicker matter, but it is principally silica. Two ounces of my agent are sufficient for a gallon of sewer water containing matter mechanically and chemically combined, to the extent of thirty grains to the pint dried at 212 Fahr.

Now this experiment, in our opinion, proves Mr. Cooke's agent does precipitate all the solid matter, excepting muriate of soda and iron. The

small quantity left behind would rather improve than deteriorate the river water, whilst they are of no great value as manure. We have seen the thick stuff when precipitated from the sewer water; it is of a dark grey colour, and in pulp like paper pulp, and not unlike what he states—"threads of over-boiled beef," and is insoluble in cold water. From experiments he has also made, he has ascertained this matter can be easily dried, and it then forms a pulverulent manure, quite equal to guano, which is now selling at from 7*l.* to 10*l.* per ton. It is, therefore, quite certain, if he can do what he represents, and can convert the sewer water in this manner, every person must admit the plan ought to be put into operation at once, he being called upon first to give some public test, showing its feasibility. The value of the contents of the London sewers have long been known, though much exaggerated, and some plan ought, ere this, to have been adopted to make the value of these contents available.

The Commissioners of Sewers are the parties that should investigate a matter of this sort: they are the representatives of the rate-payers, on whom the now enormous expense of maintaining the sewers rest—and they ought to see if the sewer water does contain this valuable material, that some mode be adopted to convert it to a useful purpose, and with the funds obtained, lessen the rate, and give the rate-payers that advantage they are entitled to. But, unfortunately, there is an unaccountable apathy about these gentlemen, which we believe nothing will rouse but an act of parliament: we shall then find them rushing from their lairs against all parties who attempt to molest their majestic repose; and when the thing is likely to be thoroughly investigated and carried, whether they will or no, they will be found, if we may so term it, *bore-ing* parties with what they intended to do, had they been left alone, which we will sum up in one word, *nothing!* It behoves every agriculturist, and every townsman, who desires prosperity to agriculture or health to towns, one and all to lend a hand to any feasible means by which the products of the sewers of towns could be collected, and prevented, as they now are, running to waste. We have seen no plan so likely to answer as Mr. Cooke's; it combines simplicity with economy, and is based on a good chemical foundation that we believe will stand any investigation.

We understand the chemical agent he employs to convert the solid matter of the sewer water into the state he describes, is to be obtained in London in any quantity, and that it is exceedingly cheap; also, that very little is required to be used to effect the purpose. The works he proposes to erect are certainly simple enough, as any party may see by the description given.

NORTON FARMERS' CLUB.

The monthly meeting of this club was held on Monday, in the society's room, at the Bagshawe arms; Mr. Wm. Littlewood, of Moor Top, in the chair.

It was intimated that in the absence of the paper which had been set down for this evening, Mr. Tillotson (who has had considerable practice in superintending improvements on the estates of extensive landed proprietors) volunteered to supply the deficiency, and would read a paper

ON THE PLANTING OF FENCES.

Mr. TILLOTSON, after a few introductory remarks, in which he stated his willingness, at all times, to promote the interests of the club, said that the subject of his paper this evening was rarely canvassed by farmers, though he considered it to be one of great importance. He should divide his remarks on the planting of fences as follows:—

1. Their probable origin and irregularity;
2. Their injury on account of number, width, timber trees, and consequently great exhaling surface exposed;
3. The remedy by planting new ones;
4. Mode of treatment when planted; and lastly, The expense of doing the work.

First, then, with regard to their origin. It is quite plain there was a time, however remote the period, when England was, if he might be allowed the term, "a howling wilderness," when gregarious flocks and herds formed the staple of the land. Hence, petty rights and privileges as to boundaries for grazing, which would, no doubt, be put up as circumstances dictated, and not with any regard to the good of society generally. With regard to irregularity and variety, they were nearly left to vague surmise, for they had but very meagre sources of information from books, though the subject was one of much interest. He came, therefore, to the following conclusion—that as population increased, every district chief felt more the importance of his situation; hence not only the fixed boundaries of his domain, but the interior divisions, as best suited the immediate circumstances of the case. Thus, the midland and eastern counties betook themselves to rude planting; the upland and more northern districts to building, or rather rearing up boundaries to different inclosures, because stone abounded. The Irish and other portions of the United Kingdom put up sod banks, and mounted them with gorse or furze. This rude state of things continued, with but little alteration, until about the sixteenth century, and they were

not wholly obliterated in the nineteenth century, but were yet shedding their baneful influence over a great portion of the land, which might be much more beneficially employed. Mr. Tillotson then alluded to the injury done to land on account of the great number of timber trees, and consequently great exhaling surface; and proceeded next to the number of unnecessary fences, respecting which farmers were generally in error, and he thought he should be able to shake the confidence of some of his hearers on this point. Suppose they enclosed an acre of land in the form of a square (for the more they departed from this form, the more they increased the length of fencing), and that they fenced a ten-acre field in the same form. They would find that the one acre took one-third the length of fence that the ten acres did. Consequently, the ten small enclosures would take 2,800 yards, while the large one would require only 880, thus giving a saving of 1,920 yards, or more than one mile in length; while the ten acres in the shape of a parallelogram of half the width of the former, would take just as much fencing on the two sides as the ten acres would (the ends being additional), and so on in proportion for various sizes, but he had quoted the one and the ten as numbers best to be remembered. With respect to timber trees in hedgerows, they were an injury to a considerable extent, which could not be denied, and pernicious to vegetation. Their shadows, speaking more especially of ash, were destructive to nearly the extinction of as much vegetation as the tree covers. The elm, by its roots running so near the surface, was another bane to the husbandman. Suppose, on an average, they cover each twenty feet square, their injury would be proportionate to the number. The width of fences was a matter of great consequence, distinct from their harbouring rank weeds, birds, snails, grubs, and many other insects obnoxious to vegetation. He found the width of many old fences to be as much as ten or twelve feet from the furrow in the one to the furrow in the other field, and this too in districts taken to be well farmed. Now suppose the average at only eight feet, bearing in mind the length of fencing quoted above, there will be a clear gain of 5,120 yards, or more than one acre in ten, by destroying the small enclosures. Again, suppose fifty millions of acres to be the cultivated land in the United Kingdom, and that only one-fifth was in small inclosures, and that instead of one-tenth, only one-twentieth was

gained, there would be an increase of 500,000 acres, which, farmed on a five-course system (reckoning the yield of corn at three quarters per acre), would yield the amazing amount of 600,000 quarters of grain, besides the other portion of the land in use—a formidable item to meet free trade with. The fields in the above calculation are considered of proper size for farms of from 100 to 150 acres. Mr. Tillotson next adverted to the injury sustained from the exhalation arising from so great a surface of foliage on a little space of ground, which he said was incalculable when we take into consideration how great an amount of vapour must emanate from so vast a surface of foliage, where every leaf is yielding as it were spontaneously. Even a leaf of the hawthorn is said to exude one grain per day, in spring, while oak and elm as much as two or three grains per day; it cannot be ground of surprise then that smut, mildew, blight, &c., should affect small enclosures labouring under such humidity, besides the deprivation of light, heat, and consequently a free current of air, which are three essential things in the production of grain, both as to quantity and quality. Mr. Tillotson then commenced the fourth part of his subject, viz., the planting of new fences with quick or hawthorn. He recommended straight borders prepared by digging, trenching, and manuring to a depth at least of sixteen or eighteen inches, the year before planting, thereby bringing the ground into a proper state, carefully avoiding all old quick borders, otherwise removing the soil as much as possible, or else bringing other soil wherein no such plant had been grown. The custom of raising banks for planting was bad, inasmuch as the plant does not derive that nourishment on an elevated ridge as it does on the flat surface, if the ground be either naturally dry or dried by thorough drainage. This being done, select as good hawthorn plants as you can, of at least two years' growth. A great deal depends on the quality of the plants selected, the care with which they are taken up, and the manner of their being put in again. The best time for planting is immediately after the plant has lost its leaf, generally in October, when it is quite at rest, and should be planted before it begins forming secretion for another year. Choose the plants as near all one size as you can, giving preference to small ones with large roots than large tops with small roots. Open the border with a perfectly straight side; spread out the roots, and let them lie as much at ease as you can; and be careful not to lop or prune them, for if the fine fibrous extremities be cut away, the plant loses so much of its vital power. Having given attention to these directions, plant them twelve in a yard—that is, six inches apart in the double rows, and the rows six inches asunder, so

that no two plants stand opposite each other. If fences be set in pasture-fields, posts and rails, or some other guard, must immediately be put up, not nearer than seven or eight feet of the quick border, so that the ground might be mown; thus, little loss of ground would be felt. If the guard fence be set nearer than four feet, after two years the fence will be subject to injury from the cattle. If farmers plant on arable ground, let them take such precaution as the case specially demands. After the first year, if the plants have not strength enough (which can rarely be the case), cut them within an inch or two of the ground; for, by this time, the roots will be so firmly fixed in the soil as to be able to render their support to the plant independently of the top, and may enable it to put forth fresh shoots, which, by expansion, will arrest and absorb the gases afloat in the atmosphere; for the nourishment from without is as essential to the growth of the plant as the nourishment from within. To cut plants at the time of planting, unless the season be very flattering, endangers them, and retards their improvement, for by this means they are deprived of both the supporters above named. At the end of the second year after planting, they may have their ends just cut off, but nothing more. The following autumn, the operation should be repeated, but not oftener than once in a year, and that when the sap has ceased to rise; for, by cutting before, the current of the sap is stopped, and an abundance of surface, that would be giving support to the plant, displaced. At the end of the next year, cut the fence for permanent form, always upwards, with a neat switch-hook made for the purpose. By this means, the whole energy of the plant is forced towards the ground, the part where the fence is most wanted—not broad over the top, as many are cut. Hence the necessity of plashing, which is not only expensive, but injurious, and never ought to be practised on well trained hedges. Thus may be cut off the greatest portion of the expense incurred annually for stakes and bindings. It now only remained for him to show the expense of doing this important work, which he would do as briefly as possible:—Taking up old fences (from 2s. 6d. to 4s. per acre, of twenty-eight yards), 1½d. a yard; digging, and preparing for planting, 1d. do.; planting quick 0½d. do.; double posts and rails, three on a side, 1s. do.; good quick, 2½d. do.; the total expense of the fencing amounting to 1s. 5½d. per lineal yard.

In the course of his paper, Mr. Tillotson exhibited several sketches or plans of fences, &c., which illustrated the subject of his remarks, and excited the attention of the members, who expressed themselves highly satisfied with the lucid and satisfactory manner in which the subject had been brought

before their notice. It was the general opinion of all, that fencing was but little understood in that neighbourhood, and that many valuable fences had been destroyed owing to the ignorance of those who had undertaken their training and management.

Ample testimony was given of this by Mr. ROBT. LINLEY, of Bole hill, who stated that many of his hedge-rows had been mutilated and destroyed by incompetent or mistaken labourers in that department.

Mr. TILLOTSON said, that if labourers could be made to understand their business, stakes and

bindings would be no longer required, and fences would be stronger and better in every respect, besides being far more pleasing to the eye.

Mr. GREEN felt grateful for the information which had been imparted by the interesting and instructive paper they had heard; and he for one should endeavour to carry out its chief recommendations; but more particularly that which referred to the doing away with small inclosures.

A general conversation then followed, which ended with a vote of thanks to Mr. Tillotson, and the business closed.

GREAT OAKLEY FARMERS' CLUB.

FIFTH REPORT, PRESENTED AT THE ANNUAL MEETING, HELD AT GREAT OAKLEY,
NOVEMBER 10, 1845.

The Committee, in reviewing the discussions of the past year, and of the five years which the club has existed, embracing as they do nearly all the practical subjects that occupy the attention of farmers, and exciting as they have done many very animated and interesting discussions, and although many members have had their views warmly opposed, and their opinions severely criticised, we can but congratulate and compliment you, that on no occasion has a difference of opinion given rise to an unkind expression, and we think we may add that nothing has occurred during the existence of the club, connected with its discussions, on which any member has occasion to look back upon with regret; on the contrary, we believe that the club has fully answered the design for which it was instituted; and as was expressed in the first report of the club, it has been the means of "illiciting truth, removing prejudices, and stimulating inquiry;" and in a social point of view, it has been the means of bringing together those who, although living in the same neighbourhood, were but little known to each other, many of whom are now bound together by ties of personal esteem and friendship, which the pleasant, and we trust beneficial meetings here have engendered.

First Meeting, 20th January, 1845.

Subject:—"On the Management of Sheep during the Lambing season."

A member stated, that when a sheep was about to lamb, it was advisable to remove her to a pen which was generally in readiness, but not to be too anxious to assist her, as there was often more injury done and more sheep destroyed by being too hasty to assist them than if they were left to themselves.

He recommended that a sheep that had twins should remain penned a day or two until the lambs were sufficiently strong to keep with and know their mother; many lambs lost their mothers by being turned out too young.

If a sheep experienced difficulty in lambing, and required assistance, it was advisable to give her a fever drink to prevent straining; this was often delayed till the fever had gained too great an ascendancy. The drink he found most beneficial was the Ewe's Relief, or Shepherd's Friend.

A second member said he had experienced much benefit from the use of the Ewe's Relief in the cases alluded to by the first member.

The secretary then read, from a work published by Mr. Clater, his views on the management of sheep during the lambing season, in which the members generally concurred, except in the use of the knife for castrating lambs; to this plan the members were opposed, as an unsafe plan compared to drawing. Some discussion took place as to the best plan to induce a sheep to take a strange lamb.

The first member stated that he had (when he wanted a sheep to take a strange lamb) watched her lambing; and as soon as she had lambed, he rubbed the strange lamb well against the young one, and then first presented the strange lamb to the sheep; on this plan he seldom failed of inducing her to take them both. When a lamb was lost, a strange lamb might be substituted by putting the skin of the dead lamb on the strange one, and rubbing it well with the liver of the dead lamb.

A third member said, when his shepherd found a lamb benumbed by cold, he always wrapt it in his coat, and put it a considerable depth in a manure hill. He had had many lambs restored from the

warmth generated in this manner, which could not have been restored in any other.

The second member said he had adopted the same plan, with sheep that had fallen into his marsh ditches, and were to all appearance dead, with great success.

Resolved, It was the opinion of the meeting, that the plan recommended by the first member would ensure success in the rearing of lambs, and that the recommendation of confining the sheep and lambs in small pens a day or two, until the lambs were strong, was beneficial to sheep and lambs; and with twin lambs it was essential to success in rearing them, as warmth and shelter at that time were as essential as food.

Second Meeting, February 17th, 1845.

Subject:—"On the Horse, and the Diseases common to him."

A member said, that he regretted his inability to give much information on this important subject, nor should he have presumed to do so but at the request of their worthy chairman, to whom they were all so deeply indebted, and to whose exertions they owed their present prosperity as a club.

He said he should now speak of horses for agricultural purposes as more suited to the objects of this club.

The Suffolk breed of the present day stood high in the estimation of this country, and he thought deservedly so; their action was more nimble, and their unrivalled courage and determination at a dead pull made them the most valuable for agricultural purposes; but he thought there was an evident improvement in the Suffolk horse, within the last few years.

He was not an advocate for a short-legged thick-set horse; he liked to see them well up in the forehead, more straight in the barrel, and not quite so heavy; he thought by this shape much was gained in activity. The Flemish horse was introduced into this country some years ago; but he did not conceive they possessed that courage so inherent in the Suffolk. Youatt said, "that our heavy draught horses, and even some of the lighter kind, had been crossed with the Flemish horse, and much improved;" but he differed from him in this opinion. There were so many varieties of horses in use in this country, he should leave that part of the subject to others, and speak of some of the diseases common to him, and which had come within his own observation.

And first, of *broken Wind*, which was occasioned, in his opinion, in most cases by overfeeding; for it was generally perceived in horses that were most greedy in their food; the stomach being over-loaded, it naturally pressed upon the lungs. It was con-

sidered by some that it was caused by furious driving, which he should think probable, if the horse was worked immediately after having filled himself. He thought there was no cure for it; but the animal might be greatly relieved by being particular as to its food, and giving it but little water at a time.

Poll Evil was caused in most cases from tight reining, or a violent blow on the poll; it was difficult to cure, though some farriers professed to do so. If it was an old horse, and not of much value, the best cure was to cut his throat.

Colds.—This disease might generally be cured by warm stabling and bran mash, and bleeding, if there was any tendency to inflammation or indisposition to feed.

Sandcrack.—He should say rasp or pare the crack out, and then pitch it; the foot ought to be filled with salt-ooze or cow-dung, and great care taken in shoeing that no nail penetrates the foot near the crack; he had tried this once, and turned the horse off for a month, then worked him on the land during summer, and he was then sound.

Eyes.—When a horse is down in the eyes, many persons were strong advocates for setons: for his own part, he should let nature take its course; he thought there was no good done by torturing the animal, if it proceeded from cold, or was constitutional.

Quitter.—He once saw quitter in a horse. This disease arose from various causes—bad shoeing, prick of the fork in the stable. He should recommend burning it out of the foot in the first instance.

Lampas.—Many persons were astonished at their colts looking so badly about the age of 2 or 3 years; but in the majority of cases it was caused by *lampas*. He should recommend lancing the gums, in preference to the old mode of burning.

Grease.—In the summer it might be kept down by feeding on green food; but in the winter, when the horse returned to dry food, it would evidently return. He recommended washing it with warm soft soap and water, and poultice; and it would materially assist nature to keep the bowels open by carrots and bran mash. After a journey, an ounce of nitre in water would be very beneficial. Many horses generated it through bad grooming, and some constitutionally.

The meeting, after thanking the member for the interesting account of the noble animal which had been the subject for discussion, took a general review of the diseases, and their causes, and the mode of treatment recommended; and after a general conversation, rather than discussion, the meeting fully agreed in his observations.

Several other diseases were then commented on. For the *quitter* and *gripes*, so common amongst

horses, many remedies were recommended; and it was generally considered safe, if not essential, to bleed for this complaint, as it had a tendency to promote inflammation.

It was said an unlimited use of clover hay was liable to create broken wind.

A question was asked by a member, if it was advisable, as he had the opportunity, without a great outlay, to make a separate inclosed box for each of his cart horses; but it was generally thought not advisable to do so.

Several members spoke upon the the ill effects of closely confining horses, which from the nature of their work must often be exposed to stand in the cold after being heated.

A member stated, it was the observation of an old and experienced farrier, when the plan was some few years since generally discontinued in this neighbourhood, of confining horses in the stable after they had been baited, "that now farmers had made up their minds to keep their horses in the yard instead of the stable, they might as well hang half the farriers, for they would not be wanted;" and it had been found on experience, that the loss of horses in this neighbourhood had been considerably reduced since they were unconfined, and their health much improved.

Third Meeting, March 17th, 1845.

Subject:—"On Stifle Burning."

A member said, he would be considered in his observations to connect the process of burning in general with the subject first named, and remarked that the object of burning and stifle burning was the preparation of earth or other raw matter by the process of fire for the purposes of a manure; he considered that the phrase stifle, as applied to burning, referred to the heat and properties embodied in a bulk or quantity, whereas merely burning referred to a process in which a greater part was exposed to the action of the air; consequently the heated properties were not suppressed as in the first-named operation.

In entering more minutely into his subject, he would refer to the soils most calculated for the purpose, and such as were not. He considered it useless and in some measure impracticable, to operate upon sandy, gravelly soils; as also upon mixed soils in which the properties were nicely incorporated for the growth of plants. And having glanced at the soils unfit, he would speak of those best adapted—viz., clays, chalky, and woodcock soils, or a mixture of clay and loam.

After describing the methods generally adopted in burning, and the quantities used, he proceeded to the effects, advantages, and disadvantages resulting from the process of burning. He could not

but think that the effects and advantages were not at present sufficiently understood, nor could he pretend scientifically to explain them, but he had witnessed their beneficial results.

He then quoted the words of an eminent agriculturist—"That it is proved by innumerable trials that the substances produced by paring and burning constitute a powerful manure, and that greater crops may be thus procured than by any other means. That much benefit results from these substances is beyond doubt, the circumstances that if they are removed, the succeeding crop suffers greatly."

The author then explained the nature of these substances. "When the earth has been thoroughly heated by fire, its particles, if separated, lose the quality of coalescing; it freely admits the delicate fibrous roots of young plants, and thus promotes their vegetation. Another property is the power of imbibing water and retaining it in the earth for the purpose of vegetation, and hence its utility in thin and chalky soils where moisture is desirable. Soils susceptible of the greatest improvement from burning contain a considerable portion of the oxide of iron, which the process tends to decompose, and the oxygen thus obtained may unite with the carbon of the ashes and produce great fertility. After it cools, the earth probably retains latent heat, which it may communicate to growing plants."

He thought that as carbon and water were the food of plants, a considerable portion of carbonaceous matter was retained in the ashes, by stifle burning.

As to the best uses, and their application to the rotation of crops. They were approved of for a wheat crop in some instances; but, he thought the ashes more appropriate to turnip or root crops. They were also used beneficially as an absorbent of valuable liquids from manure yards, being spread over the bottom of the yards instead of haulm or other materials generally used. As the grazing of cattle was not always attended with pecuniary advantage, it was desirable, in the present state of agriculture, to consider every means to acquire a crop at the least possible loss and expense; not that he wished to be considered as recommending the disuse of so interesting and sometimes profitable employment as grazing, for which he had proposed a preparation for the yards, but whether or not in many cases a manure might not be prepared by the process suggested, as an advantageous substitute.

The meeting, after listening with considerable interest to the address, fully discussed the subject.

Several members bore testimony to the benefit they had experienced on some soils, and the high esteem in which it was held; but all admitted that the trials which had been given it in this neighbour-

hood had not been attended with very beneficial results. Several instances by different members were brought before the notice of the club, in which no benefit to compensate for the expense incurred had taken place.

A second member said he had applied it to his marsh lands to a considerable extent, without any apparent benefit to the crops; but, he thought the process of ploughing and pulverizing the land was facilitated by it; he only approved of clod burning as a means of cleansing large coarse borders of fields from weeds, couch grass, &c.; but as a manure, he did not think anything of it, and he believed in no part of the country was it carried to the extent it used to be.

The meeting resolved, that however desirable and beneficial burnt soil might prove in some localities, it was evident, from the various trials that had been made, it was not calculated to benefit this locality to any extent.

Fourth Meeting, April 21st, 1845.

Subject: "On the Soiling of Cattle during Summer."

A member said, that for bullocks, cows, and calves, he preferred mowing, and feeding in stalls or sheds; and, at the early part of the season, the addition of clover or hay, cut into chaff, with the green food was highly beneficial to the cattle, and it also tended to economize the green food until it arrived at its full growth. For sheep, the best plan was to feed in the field, and not to allow them to feed too bare, as it much lessened the quantity it would otherwise produce, and not unfrequently entirely destroy the plant.

A second member said, his father's plan was to feed his cattle in the field during the day in the early part of the season, and to yard or house them at night, and give them an oil-cake each; and during the latter part of the season, to house them in the day and give them a cake, and turn them out at night to feed.

This interesting and important subject excited more inquiry than discussion, for, with the exception of one or two members, it had not been practised; but those who had practised it gave it as their opinion that it was in every point of view desirable to consume as much as possible the green food grown in summer, in yards and sheds, for all cattle but sheep.

Fifth Meeting, May 19th, 1845.

Subject: "On Cattle, and the Diseases common to them."

A member said, the subject was certainly a most important one. It was important to the public, who by this means were, and might be, well sup-

plied with a most necessary article of food; and it was equally important to breeders, farmers, and graziers, as the question of profit or loss in these pursuits must almost entirely depend upon individual knowledge of the best description of stock to rear or purchase, and the best mode of rearing, feeding, and fattening them, as well as upon the best means of preserving them in health or restoring them to it when attacked by disease.

He said it would be presumptuous in him to pretend to enter into the practical part of these subjects—viz., as to what kind of cattle would answer best in this locality for breeding, milking, or fattening; which lean beast would, when put to expensive food, fatten fast and evenly, and which, in fact, would not fatten at all; and what simple remedies should be applied to particular diseases upon these subjects. He hoped to be benefited by hearing the discussion which he hoped would follow.

After various extracts were read from Youatt's excellent work on cattle, and the diseases common to them,

A second member said, in selecting the best breed for fattening, he thought, all points considered, that we could not select a more profitable breed than the short-horn. It was contended he was a large consumer; but this partly arose from his disposition to early maturity, as compared with other cattle, growing and fattening at the same time.

Some discussion took place as to the advantage of rearing our own cattle for grazing. Some contended that they could purchase at a cheaper rate than they could rear, and that those bred from home fed faster, when put up to fatten, than those bred at home; others contending that a larger return could be made off a farm by rearing cattle for fattening.

Considerable discussion took place as to the various diseases cattle were liable to; but it was generally admitted that, when there were any size and condition, it was most advantageous to slaughter an ailing animal, and that this plan being generally adopted tended very much to retard improvements in the mode of treatment of the various diseases to which they were liable.

Sixth Meeting, June 16th, 1845.

Subject: "On the Management of Manure Hills."

A member said the plan he had been taught of preparing manure hills was very simple, and quite an old one.

1st.—To prepare a bottom with as good earth as he could get; to carry a good portion of chalk, and mix them together to the depth of about 2 spit. As to the quantity, some thought half a waggon load to the acre, mixed in the bottom, was requisite, or

at least not too much. His present plan was, however, to carry the chalk on the land clean.

2nd.—To make the straw manure as good as he could with artificial food, carry it to the bottom, and drive on or throw it up as most convenient. He was in this respect guided by the time it had to lie; if wanted in a short time, throw it up that it might be kept light and sooner prepared; but if it was to lie some time, he should say drive it on, because he thought the closer it was kept the less it would waste. He always preferred that it should lie a short time, but it was not always convenient; for instance, manure for wheat he got out of the yards in summer, when he had the most opportunity. On those lands where he had fallows of peas or beans, there was no time for getting manure out of the yards after harvest, as it was a busy time.

3rd.—He thought it a good plan to put one or two freights of London manure in the hill, according to the size—say, one waggon load to the acre; for sometimes the straw manure is very long and raw; it will help to heat it, and by that means kill the weeds, and likewise shorten it, so that it is sooner prepared; and it greatly increased our stock of manure. He found that some people recommended guano instead of London manure; but he had not tried it; he preferred the latter, but he thought the ordinary straw manure quite equal to it. Could they get the London manure without the rubbish generally found, he thought it might answer the purpose.

4th.—When the hill was thus far prepared, stir it over and mix it well. Some, the first time of stirring, place all the earth on the sides and top. He had tried it, and thought it a good plan when the hill was to lie long, as it kept it from drying in a great measure; but, when it was stirred only twice, he thought the earth was not mixed well enough if this plan was adopted. He had heard of carrying short straw from the barn doors, and covering the hill over with it the second time, stirring it; he should recommend its being carefully beaten and shaken to pieces, so that it did not go on the land in lumps. He thought they could not take too much trouble about stirring the manure hills; three times stirring was necessary now and then.

A second member said, with respect to the mixing chalk with the bottoms previous to carting it on the land, he thought it desirable, as by this means the good effects of chalk were kept in the soil, and a small portion was diffused over the whole field.

A third member thought the soil or bottom was much improved by the admixture of chalk, and would impart an immediate benefit to the crops; and he also thought the chalk and earth should be

mixed twelve months at least before the manure was carted on it.

A fourth member, on the contrary, said the quality of the chalk was much injured by being incorporated with manure in a state of fermentation. This was the opinion of other members, and it was contended that, unless a benefit could be proved, a loss of time in its application was incurred, as well as an additional expense in turning and re-carting it.

A fifth member said a plan was adopted in his neighbourhood, of mixing hills by picking them over, and that it was gaining ground; and that he considered the benefit of stirring over hills was that each square yard of land had an equal portion of the soil and manure, and not for the sake of fermentation.

Much discussion took place on these points, and some difference of opinion existed, proving that this important part of the management of the farm was still in want of more light, which a more accurate knowledge of the properties of soils and plants alone could give. It was hoped that the day was not far distant when a generally acknowledged correct principle would be established.

Seventh Meeting, July 14th, 1845.

Subject: "On Sheep, and the Diseases common to them."

A member said the principal varieties of sheep consisted of the Southdown, Leicester, half-bred Leicester and Down, Norfolk, half-bred Norfolk and Down, and the Dorset and Lincolnshire. He thought the Southdown was a sheep that was as well calculated for this part of the country as any, on account of their strength of constitution, and generally doing well; that they were not large consumers, which he thought was a consideration with the farmer; that there had been great improvements in this and other breeds of sheep within the last few years, and he need but mention the names of the Duke of Richmond, Webb, Boys, Grantham, &c., to prove what he asserted.

He considered the best way to keep a flock in a healthy state was to keep them in as near one condition as possible, not to get them too fat nor too poor; to maintain this it required great care and attention on the part of the farmer, to provide the food necessary for the different seasons of the year.

As to the diseases to which sheep were liable, he would mention *foot-rot*, which at the present day occupied the attention of most; and there were but few but had been troubled with the prevailing disease in the feet, some to a greater extent than others. It was a tiresome disease, and required great care and attention in the dressing. A person must be careful to pare all the hoof off so far as

it has let go the foot and become hollow; then a dressing of the following ingredients will be found of service: 4 ozs. of green vitriol, 2 ozs. of sugar of lead, 3 ozs. of verdigris, 2 ozs. of saltpetre, half a pint of turpentine, a pint of the best vinegar, and half a lb. of oil of vitriol, put into a bottle, and well shaken, and applied with a piece of linen rag or wool, tied on a stick and dipped into the bottle. The sheep require dressing every day till a perfect cure is effected. Sheep are sometimes affected with *dunt* or *dizziness*, which takes place from water formed on the brain; some have tried trepanning; others had bored a whole in the head, with a gimblet, and let the water out; and it was said that shaking the head violently will break the bladder, and the sheep becomes better; but he thought the best remedy was the knife.

Another disease was the *scab*. It was very prevalent in this locality some few years ago, but by attention it was not so much so now. When it was not in a very advanced state, an infusion, consisting of 1lb. of tobacco to a gallon of brine, had generally been found a good remedy.

The *fly* was also troublesome during the summer months, and required much attention and watching. The plan he generally adopted was, to shake the maggots out of the wool, and rub the part with stone sublimate; if only fly-blown, rub the part, and it will destroy all intruders; and he thought when a sheep had been once struck, it was liable to renewed attacks of the fly the following year.

He then alluded to the observations of Mr. Ellman on the causes of sheep being hoven or blown; he said the plan of keeping the sheep out of the food until it was dry, instead of preventing the disease, was the principal cause of it, and that when in that state they could not be kept too quiet.

A second member said he had some doubts if the sheep benefited by the receipt alluded to were affected by the prevailing disease, as they did not appear to have been affected in the mouth.

A third member thought the disease in the feet, alluded to by the first member, was produced by the plan of folding them too closely in the yard.

Several members stated that they had adopted the plan of folding them in the yard, without any ill effects.

Eighth Meeting, September 15th, 1845.

Subject: "On thick and thin sowing."

A member commenced by reading large extracts from Mr. Davies' system of thin sowing, and from Lord Western's system of thick sowing, and the report of the Maidstone Club, on Mr. Davies' system.

A second member said, that as a principle, he

was an advocate for sowing thinner than was generally adopted; for early sown wheat, 6 pecks, and barley, 9 to 10 pecks on his best land. He said the general opinion was, that the sample was injured by thin sowing: his experience was the reverse of this. The late-sown barley required the least seed, and the early-sown wheat.

The meeting listened with much attention to the extremes of thick and thin sowing; and although the meeting could not agree to the system recommended by Lord Western, they were still more afraid of Mr. Davies; for although the saving of seed shown by Mr. Davies, if his plan was adopted generally in the country, appeared on the first view of the subject of the first importance, still the meeting could not but feel that the danger of an entire failure only once in ten years would more than counterbalance any advantage that might arise from the apparent waste of seed: the meeting thought the middle course as laid down by the second member more desirable.

A third member thought that the improved system of management, and state of the land generally for receiving the seed, rendered it unnecessary to put quite so much in as was considered necessary some years ago.

Ninth Meeting, October 13th, 1845.

Subject: "On the History of Agriculture."

A member, in introducing this subject, said those who were fond of the country, who loved to contemplate its scenery, and shared in the universal happiness which its cultivation diffused, those who had paid attention to the process of husbandry, who viewed its daily occurrences with interest, who were at the same time alive to the minutæ of the animal and vegetable creation, would derive from the study of the art and science of agriculture a gratification the most permanent and pure. It was not his intention to detain the meeting by expatiating upon the importance of the subject, as he had reason to fear it would serve to render the weakness of the execution of his task still more apparent.

The sources from whence he had collected his materials, and the periods to which they referred were as follows:—From the earliest mention of agriculture in the Holy Scriptures; from the works of Homer and Virgil; and from the History of the Decline and Fall of the Roman Empire with such observations, inferences, and suggestions, as the shortness of time in which he had collected those particulars would allow.

And first, he would inquire, simple as the question might seem, What was agriculture?

It was the art of cultivating the earth in such a manner as to cause it to produce, in the greatest

plenty and perfection, those things which were useful to man and to the animals which he had subject to him.

It was, he thought, the very basis of all other arts; and in the colonies springing up around us was coeval with the first dawn of civilization; for where agriculture did not prevail, mankind remained in a barbarous and savage state, with no other habitation than the most ordinary shed of the most ordinary cultivator. It was indispensable to national prosperity; whilst to private individuals it brought numerous blessing in its train, such as health to the body, and energy to the mind. It was favourable to virtuous and temperate habits: it was apt to lead men's minds from the creature to the Creator, and it was thus peculiarly fitted to give us some idea of the greatness of the Power by which the universe was directed and governed; the evident tendency of all the arrangements which we could comprehend, being to support the existence and promote the well-being of countless myriads.

The first mention he could find of agriculture was in the book of Genesis, where it was said that Cain was a "tiller of the soil," that Abel "sacrificed the firstlings of his flocks," that Noah "was a husbandman, and planted a vineyard," that Abraham, Isaac, and Jacob were "husbandmen," that their wealth consisted in flocks, and that "they roamed at will over the entire country in search of pasture."

He said it might be useful to name the dates of the following important epochs.

The Creation was computed at	... 4004 years B.C.
The Deluge	..... 2348 years B.C.
The building of Rome	..... 753 years B.C.

More than 1300 years had now elapsed since Egypt first began to export corn to the amount of 260,000 quarters of wheat, and in return for it received the manufactures of Sidon. Thus society was enriched by mutual exchange in those early times; and as it was with the inhabitants of those countries at that time, so it was with us now—every individual was lodged, clothed, and maintained by the joint and several industry of a thousand hands.

But flourishing as the state of affairs appeared to be with those countries, we find them at one period suffering from a bad harvest, and from the price of bread rising in proportion to the scarcity of corn, the fair and reasonable proportions being violated by the rapacious acts of monopoly.

Who had not witnessed in some shape or other this unequal contest?

In this case we saw the produce of the land claimed by one party as his exclusive property,

used by another as a lucrative object of trade, and required by a third for the daily and necessary support of life; the consequence of this was that all the profits of the intermediate agents were accumulated on the heads of the defenceless consumers.

They wisely considered agriculture to be the very foundation of manufactures, and for the best of all reasons—because the productions of nature were materials of art.

As it was with the Romans, so it was with us—the mainspring of improvement in agriculture was a source of interest; and those refinements, which under the odious name of luxuries were often severely condemned, were, he thought there could be no doubt, essentially conducive towards this desirable end. It operated in this way—mechanics and others, who had no share in the division of the earth, received a voluntary tax from the possessors of the land, in a shape most familiar to most, that of Christmas bills; and landowners were necessarily prompted to improve those estates with whose produce they could purchase additional comforts, and thus the operation of this principle was felt in every stage of society.

Thus far all appeared to have been well with them; but mark the consequence of opening a foreign trade to supply their increased wants.

Voyages were made to distant countries, and were rewarded with great profits; but those profits came out of the pockets of Roman subjects, and a few individuals were enriched at the expense of many. The natives of the countries to which these voyages were made (Arabia and India) were contented with their own manufactures, and would receive nothing but money in exchange for their goods; and thus it was that the wealth of the mighty Empire of Rome declined and fell, being irrecoverably given away to foreign and hostile nations.

Agriculture languished, good morals were neglected and despised; but it must be remembered, notwithstanding these sad results, that the same freedom of intercourse which extends the vices, diffuses likewise the improvements of social life.

He then proceeded to give a very interesting account of many flowers, herbs, fruits, and plants, and the localities from which they originally came.

He said the Egyptians were so sensible of the blessings of agriculture, and carried their gratitude to such an absurd excess, as to worship the ox for his services as a labourer; that Hesiod, a Greek writer, wrote a poem on agriculture, entitled "Weeks and Days," which was so called because husbandry required an exact observance of times and seasons. Various manures were in use, and one writer remarked that a mixture of soils was calculated to produce the same effect as manure. Clay,

he observed, should be mixed with sand; and sand with clay.

Allusion was made by another writer to the implement known by us under the remarkable cognomen of a double-toin; he mentioned a plough with two mould-boards, with which he says, "when they ploughed after sowing the seed, they are said to ridge."

Crop and fallow was the system, and from this the Romans never deviated.

Feeding young corn when too luxuriant was practised, as appeared from Virgil, who wrote, "What praise shall I give to him who, lest his corn should lodge, feeds it while young, as soon as the blade equals the furrow?"

He said that watering was applied on a large scale, both to arable and grass lands, and that they considered good tillage as of the very greatest importance.

After many other remarks, he begged to refer to chemistry, and said, let not the practical farmer be alarmed when he was told that he must bring this science to his aid, than which nothing had more contributed to our happiness by enriching the arts of life with useful inventions.

Agriculture had now assumed an entirely different character. Many first-rate chemists had turned their attention to it, and many farmers were eager to listen to their suggestions in explaining that which before was thought a mystery.

He said they knew very well that certain manures were good for certain soils, and that certain soils produced some kinds of crops luxuriantly, whilst others would not grow upon them. But did they know the why and the wherefore?

Why was it that they could not produce certain crops at will? Why did not manure always produce the same effect, although laid apparently in the same kind of land? weather of course being favourable.

Here the scientific chemist might be of immense use in solving these questions.

But empty words were fast giving place to rational ideas; farmers were no longer prejudiced in favour of their old modes of procedure. Let but practice and theory go hand in hand, and improvement was sure to follow.

JAMES BARKER, President.

HENRY SPURLING, Secretary.

MR. GOWEN'S FARM, NEAR PHILADELPHIA.

We extract the following particulars from the "British American Cultivator," a well conducted Canadian journal. They relate to what, we presume is a rare case in America—to one which is only paralleled on land in the immediate neighbourhood of good markets:—

"The farm is located near Philadelphia, and now contains about 100 acres, exclusive of woodland. Mr. Gowen took possession of it in 1834, at which time it is represented to have been in a very worn down and poor condition, from the neglect and bad management of previous owners. Mr. Gowen took away the old fences, made a new division of the farm, and fenced with stone wall and hedges of the Osage orange, drained and filled up ravines and gullies. The land is now brought into a high state of cultivation, producing 100 bushels of corn, 400 bushels of potatoes, 30 bushels of wheat, &c., to the acre. He at first bought manure from the city but after three or four years' experience, he gave up the plan, and has since made enough on his own premises, excepting light dressing. To do this he has been obliged to increase his stock of animals. 'To maintain my stock,' he says, 'and bring my land to a high state of cultivation, by the most efficient and economical practice, has been a leading object; and to

accomplish this, required no ordinary management on such a farm. The stock in cattle has ranged for years, from 40 to 50 head, in addition to the necessary horses, with a large stock of swine for breeding and fattening; and these I have fed from the produce of the farm, except the purchasing occasionally of some straw, and supplies of mill feed for the horses and swine, and some meadow hay for the cattle, selling frequently its equivalent in Timothy. During the same period I have sold hundreds of bushels of rye, some wheat, and on an average 400 bushels of potatoes annually, with some 300 or 400 bushels of carrots, besides providing for the family. But the chief income was derived from the cattle. My expenditures during the whole period could not be otherwise than large; as I could not put up so much stone fence and picket fence as incloses my farm without incurring a heavy outlay; but I view these improvements as cheap in the end. It may be safely inferred, that there is not at this day any farm of the same extent in this part of the country, that can so easily be worked, or will require so little expense for a series of years in keeping the fences in order, especially when the hedges are taken into account. I am also of opinion, taking in view the condition of the soil, as to depth and richness,

as well as its being entirely free of stones, and other impediments, that I can make it produce as much as any farm of its size in any part of the country, for a series of years, and at as small an expense.

“The secret of keeping so large a stock on so little land, consists in my practice of partial soiling, and green crops, whereby I make some four or five acres do the work of 30 acres, in the ‘slow and easy way.’ From May to August, my cattle are confined to one or two fields, most commonly one, to which they are driven, more for exercise in the cooler parts of the day, than for pasture; they being fed in the stables early in the morning, at noon, and at night, with food cut for them from a lot adjoining the barn yard. The food is generally of lucerne, orchard grass and clover, oats and corn. The patches from which the corn and oats are cut are always sowed with turnips in August. No one can credit, unless he has had proper experience in the matter, the quantity of food that one acre of lucerne, one of rich orchard grass and clover, and one of oats and corn, afford from May till August; nor can he estimate the great saving in manure, much less the comparatively good health of the cattle, from not being exposed on the naked fields, under a fervid sun, toiling all day in search of food. This practice allows me to crop almost the whole of the land, and to make some 120 to 150 tons of hay annually. In the fall, from August to November, the cattle have the whole range of the mowed lands, as I do not cut second crop grass for hay. Then for winter feed, I have always an acre of sugar beet; half an acre of sugar parsnips; half an acre or more of carrots, for my horses; and generally from three to four acres of turnips. I report to the committee on crops this season, over 100 tons of these roots. In 1843, I gathered from one acre, 1078 bushels sugar beets; 60 lbs. to the bushel; carrots at the rate of 687 bushels; sugar parsnips 868 bushels. This year 972 bushels sugar beets; 970 bushels carrot; 700 bushels sugar parsnips; and from three and a half acres, 2,500 bushels of turnips, sowed with Timothy seed.

“The farm buildings consist of three substantial stone barns, one 70 feet by 33, another 50 by 26, and another hipped roof with cupola, 57 by 25, besides a large over-shoot stable and hay house, stable high of stone 60 feet by 30—the lower floors of all these are made of broken stone and lime, planked, being vermin proof. There are, also, a corn crib capable of holding 1200 bushels of corn, one barrack, ample hog-pens, and sheds for carts and wagons. The barn buildings have been filled this fall to their utmost limit, except the corn crib. A substantial stone wall encloses the principal manure heap; the drainings from this heap are led into a

place of deposit, in which are received also a drain, that runs under ground from the kitchen, as well as drainings from the pig-pens, and the washings from all the yards. These drainings form an important item in the supply of manure to my land; it is a saving which I cannot estimate at less than 200 dollars a year. This liquid by a simple process is applied to the patches of roots, &c.; and to this may be ascribed my great success in raising such crops. Of improved cattle, my first effort was with the celebrated ‘Dairy Maid,’ still owned by me. Her first calf, Leander, by Whitaker’s Prince of Northumberland, was reared and kept by me, for breeding. Dairy Maid’s calves alone, exclusive of Leander, have already sold for more than 500 dollars. It would be curious to trace her profit at this day, by stating an account of her first cost, her keep, and that of her son Leander; crediting her by sales of her own calves and grand-calves; deducting for the portion of the capital which was invested in the dams that produced the grand-calves. To do this would extend this paper to an unusual length—suffice it to say, that Dairy Maid has long since paid for herself, and that those who laughed at me for giving 540 dollars for one cow, may turn this statement over in their minds, and think, whether since 1838 any investment of theirs, to the same amount, in any other branch of husbandry, has paid so well. But there is a satisfaction beyond that of the pocket, and that is, that Dairy Maid’s breed will be of infinite service to the country. Her calves and grand-calves are pretty well scattered already; and I make no doubt that, wherever found, they will demonstrate the high character of the parent stock. My sales for the last two years, exclusive of Dairy Maid’s calves, amount to over 2,000 dollars. The stock now on hand is about 40 head, principally Durhams. The butter sold for the last two years exceeds 750 dollars; this is a respectable item, when the calves that were reared, and the supply for my family, are taken into view. From early fall to spring, the butter averaged 70 lbs. per week—the quality highly appreciated both abroad and at home.

“In the hog line I have been quite successful, at least in bringing the animal by judicious crossing to great perfection. I fattened off my old Lincoln and Berkshire boars, and my Hampshire and Chester county sows last month; they weighed from 400 to 450 lbs., sold for 86 dollars 24 cents. Have sold the last two years of pigs, designed for breeding, 150 dollars. Bacon, lard, &c., over 120 dollar, besides having on hand 14 fine young barrows, last fall’s pigs, now ready for slaughter, which will weigh from 250 to 300 lbs. each, value 150 dollars. The stock on hand consists of one fine boar of Lincoln, Hampshire, and Berkshire breed, one brood sow of Berkshire breed, 12 shoats, and seven pigs.”

CHEMICAL ESSAYS.

BY JAMES MAIN.

The chief features of agricultural periodicals, for the last six or seven years past, have been those recommending the science of chemistry to the attention of farmers, as a portion of knowledge which would be of the greatest service to them in the prosecution of their business. There can be no doubt but that these writings have been of much use to those who have a turn for investigating those occult phenomena of nature which are ever occurring to the studious cultivator of plants. But among the generality of farmers, chemical knowledge has not made that progress which their friends expected, owing, perhaps, to its uncouth terminology, and to its treating of powers and bodies which can neither be seen nor felt, at least not ostensibly so to common observers. To render the science of chemistry as familiar and comprehensible as possible, some of the writers have explained the terms as clearly as can be, and also explained the action of the bodies so named upon those with which they are combined or come in contact. For instance, *carbon* is said to be a simple body, black and brittle, found in various substances. *Hydrogen*—one of the principles of water: when in a state of gas, is inflammable. *Gas*—a spirit incapable of coagulation. *Oxygen*—a principle of the air, respirable, and necessary to combustion: when combined with other bodies, renders them acid.

Among other published essays, showing the application of chemistry to practical farming, there has lately appeared a lecture delivered at the Farmers' Club, Burton-upon-Trent, by Albert James Bernays, member of the Chemical Society of Derby. This intelligent young lecturer appears to be quite master of his subject, and shows no small share of sound practical knowledge of farming. In faithfully detailing the latter, he introduces his chemical ideas with much perspicuity, and which, when so closely applied to the actual processes of the business, throws much light on the subject.

In the course of his lecture, he notices all the principal processes of agriculture. Ploughing, he says, is not so much necessary for the pulverization of the soil, as it is for loosening the surface for the admission of atmospheric influences, so indispensably necessary to the roots of plants. The air supplies a chief share of vegetable food; and no plant can thrive if debarred from a necessary portion and constant change of that compound fluid.

Draining and its effects he explains very accu-

ately. He proves that no plant (except aquatics) can thrive in a soil which is saturated with water, because the interstices between the particles of earthy matter are closed by the fluid, and all access of air prevented. His advice on the execution of draining, as well as on its great usefulness to land subject to receive or to hold too much moisture, whether arising from springs, or falling from the clouds, is all practically useful and extremely correct.

It would be well, because much more useful, if all the chemical essays, which now engross so much of our agricultural literature, were written on the same plan as is the lecture of Mr. Bernays; that is, introducing their chemical remarks at the same time they are detailing the ordinary practice and processes of farming. This connection of the two subjects would lead the farmer's mind to a clearer perception of the chemist's advice, and habituate his memory to retain those principles inculcated by his scientific teacher, and thereby acquire, without much mental labour, all necessary information of which his friends believe he stands so much in need.

That the present race of farmers are on the improve, and that they may be much more enlightened by an amalgamation of chemical and mechanical lore with their own homely occupation, is a truth that cannot be gainsayed; and if they are doomed to contend with foreigners more than they have hitherto been, they will have to call in every auxiliary to assist them in maintaining a pre-eminence, as well for their own sakes as for that of their own country. British agriculture, though far superior to that of any other country in the same parallel of latitude, is still susceptible of improvement; and it behoves every one engaged in it to avail himself of every offer of assistance, come from where it may. The farmer will do well to consult the geologist; the latter will inform him how far drainage is practicable; he will explain the extent, the nature, quality, and different depths of the various strata which compose the surface of his farm—a portion of knowledge of which no farmer should be ignorant. I once cultivated a farm situate on the southern slope of the Chiltern hills, in Buckinghamshire: the arable surface was chiefly a gravelly sand, and in hot and dry summers the crops were liable to burn. Beneath the upper bed of gravel thin layers of clay occurred; and beneath was found a vast deposit of chalk. Now,

without the presence of the chalk, the district would have been a very barren possession; for a constant and long-continued custom prevailed, to raise the chalk from below, and spread it on the surface in autumn, to be disrupted by frost, and ploughed into the ground during spring. This dressing of chalk is repeated periodically, according as the effects of the former application disappears. It is quickly and conspicuously serviceable; it renders the soil more open, and easier cultivated. It has such an affinity for moisture, that when exposed to the air, it is always damp; and, of course, is particularly useful to crops on dry soils; and on clays, from its attractiveness for water, it serves to ameliorate the adhesiveness of clay under the action of frost. On grass land a thin coat of chalk does much good; adding fresh verdure and strength to the grasses, and affording a fuller bite to depasturing animals. On a survey of the general face of this district, it appears that *chalk-drawing* is a very ancient custom; as in every field there is one or more hollows, some of them so large as to be called dells; from which the chalk, in times long past, had been withdrawn. Where the chalk rock was near the surface, it was bared and carted out upon the surrounding surface; but if lying deep, a shaft was sunk to reach the rock, and the chalk was raised in buckets by machinery, by a gang of men called chalk-drawers, who were paid so much per acre for raising and barrowing it from the mouth of the pit to the surface around. This appears to have been a principal means of improving the gravelly soils of that country; and where soluble clay or marl was found, it was raised and used for the same purpose of giving solidity and consistence to the friable staple of the ploughed land; an expedient as necessary in modern practice as ever it was in earlier times.

Where strata of clay alternated with those of sand or gravel, and cropped out to the surface, a wet spot bearing rushes was the consequence; but this oozing out of water, which flowed over the impervious bed of clay, was easily got rid of by cutting a drain through the clay at some distance above the wet place to allow the water, to sink into the underlying bed of gravel or chalk. And in all cases of such stratified land, where wet and dry spots appear near together, cutting a drain from the former to the latter will lay the whole surface dry; and in this simple way, much efficient drainage may be executed at a very trifling expense. It is this knowledge of the various beds of earth which compose the cultivable surface, which empower the geologist to suggest, and the cultivator to perform, important and permanent improvements on land, which, to a person entirely ignorant of science, would appear impracticable, or even impossible!

In the same district chalk is often mixed for burning into lime, both for builders and farmers; and where fuel is plentiful, if the farmer can burn his own lime for about four-pence per imp. bushel, he cannot lay out money to better advantage. A command of lime for agricultural purposes is an invaluable benefit; and wherever chalk or limestone abounds, it is, or may be, of vast importance to the arable farmer.

Besides improving the arable staple of the land by draining, and by an intermixture of the different descriptions of earth found on the farm or in the near neighbourhood, enriching it with manure is the next most necessary expedient. Accumulating, management, and application of the common manure made on a farm is well known to most farmers; but there is a class of foreign palpable or impalpable bodies, which, as fertilizers, are highly recommended to farmers; and here the illustrations and instructions of Mr. Bernays and other chemists are invaluable. After describing farm-yard manure, which he calls the farmer's "sheet-anchor," he notices the various ingredients of which it is composed, and concludes that the dung, or ashes of the plants on which animals are fed, proves the best manure for plants of the same kinds. For example: "If we feed a cow upon hay and turnips, we obtain a manure containing all the mineral constituents of grass and turnips;" and hence the value of farm-yard manure above all other. He next gives the mineral constituents of the dung and urine of the cow and horse; and the quantities of these returned to the land when applied thereon. He gives also some good advice relative to the preparing and applying farm-yard manure. Next he notices and extols human excrements and urine as the most valuable of all others; adding, that they are the principal fertilizers used in China for corn and other crops. In fact, the Chinese use the excrements of all animals which are domesticated, particularly poultry and pigs; they having no depasturing cattle in the southern provinces, their only other kind of manure is mud drawn from the bottom of ponds and canals.

Mr. Bernays next gives the history and an analysis of Peruvian guano, and speaks of it as a useful *stimulant* when properly applied with a mixture of powdered charcoal, and thinks it well worth ten guineas per ton; African guano he considers inferior. Then follow, *seriatim*, notices and remarks on bones, soot, sulphate of ammonia, nitrates of potash, chloride of common salt, silicates of potash, carbonate of lime, quicklime, gypsum, various ashes, sawdust, charcoal, rape-dust, blood, wool, hair and horn.

To these particulars is added a tabular view of the qualities of the various substances used as ma-

nures. Farm-yard dung being the standard; qualities when dry, viz.: farm-yard dung, 100.0; oil-cake, 307.0; guano, 323.0; solid cow-dung, 117.0; mixed cow-dung, 132.0; solid horse-dung, 113.0; poudrette, 225.0; glue dregs, 288.0; coal-soot, 81.0; wood-soot, 67.0; horn-shavings, 809.0; and woollen rags, 1039.0. Most of these are more nutritious to plants while wet than when dry; particularly fresh bones, which, in comparison with 100

parts of farm-yard dung, yield 1326.0 of nutritive matter.

These calculations are curious to the inquisitive farmer; and especially if he intends to try any of these foreign fertilizers; and if not, he may rest assured that abundance of yard and fold dung will answer every purpose he may desire respecting bulk of crops.

Brompton, March, 1846.

ON INCREASING THE SUPPLY OF LABOUR.

MEETING OF THE NORTH WALSHAM FARMERS' CLUB.

Mr. GOWER: Of the amount of agricultural labour in East Norfolk I cannot speak definitely, and will merely affirm that the average is low, considering the nature of the soil, which is, generally speaking, suitable to almost any rotation. I would earnestly impress the members with the belief that capital employed in labour is a most profitable investment indirectly, as well as immediately, for by increasing the means of the labourer, it enables him to buy more of the farmer's produce. I would suggest the following alterations in farm practice—green-cropping and stall-feeding. It is an undeniable fact that double the quantity of stock may be maintained by feeding them in open yards, or what is still more preferable in covered boxes or stalls, and the extra manure thus made would amply repay the extra labour. I would beg to refer you to our report of last year for a system of cropping. I have begun in earnest to carry out that system, and shall have a piece of rye after wheat ready for soiling at the end of next month, which I intend to follow by tares, thus securing a succession through the summer, and I think I may say that by this plan I shall employ two men and two boys extra for 26 weeks. Another important improvement and source of increased employment for the labourer is the better management of our fences, which have hitherto been great obstacles to good farming, as it is very evident they injure the crops in their vicinity, and are nurseries for weeds which are continually fouling the land. When we consider the fact that in every 100 acres of land there are 10 in fences, it will be seen how desirable it is to do away with half of them. I may be told that the landlord may object to these alterations, but I believe this will rarely occur, as I am bound to say my experience has taught me the gratifying fact that the landlord will always appreciate the efforts of the tenant to provide full employment for the poor. I am aware this question opens a wide field for discussion on the restrictive clauses of leases, and I do hope the enlightened spirit of the age will tend to simplify these. I do not intend to enter into this subject, but surely it would be sufficient security for the landlord if the tenant be restricted from taking two white straw crops in succession, except when the land has laid more than one year in grass, and if he be required to consume the produce upon the farm. Increased attention to the collecting and management of manure will open up a source of very profitable labour.

Mr. CUBITT: I am aware that I am in the presence of many farmers whose example I might well follow, but I'll defy any practical man to go through the eastern part of this county—yes, even this far-famed county of Norfolk—without seeing

thousands of acres most slovenly cultivated for the want of additional labour. To improve the condition of the labourers we must endeavour to keep them fully employed at fair wages, without which all other attempts will be perfectly futile; and I cannot but think it would be to the interest of every farmer in this county to allow each of his labourers a few rods of land for the growth of vegetables. Such a system judiciously carried out would tend more than any other to improve the character and the morals of the agricultural labourers, and I think it would assist in destroying the influence of that greatest of all his enemies—the village beer-shop. But there is another point worthy of attention. It ought to be the duty of every employer to watch over the interests of his labourers, and he has various opportunities of adding to their comforts with but little pecuniary inconvenience to himself; and depend on it if a farmer expects to have good and faithful servants, he must first teach them that he feels interested in their welfare, and he will then achieve an object of no small importance to his own individual interests. And now it devolves on me to state my opinions as to the means of finding increased employment. I conscientiously believe that if all the land in this county was properly and profitably cultivated there would at the present day be a very great insufficiency of agricultural labourers. I shall commence with the road culture, and I challenge any practical farmer to ride through the more fertile districts of this county without seeing a great annual loss in the turnip crops, arising from ineffectual tillage and the want of manual labour, a loss amounting on some farms to many tons per acre, which would more than repay the proper cultivation of the whole crop (manuring excepted). A heavy crop of turnips cannot now be grown where land has been long cultivated with that plant (as in Norfolk) without great care and trouble. But I will now suppose that you have succeeded in producing from 20 to 30 tons per acre of Swedes; let them at the proper season be removed from the soil and carefully stored (except on those soils which require feeding off); it matters not what season follows, such a system in the end invariably pays a good per centage for additional labour, enables you to get your spring crops sown in one season, and what is of equal importance, preserving the rich and saccharine juices of the turnip. I now come to the method of consuming these roots. Every farmer has become aware of the advantages of box or stall-feeding, but I regret that that excellent system is not likely to become general amongst tenant farmers without the assistance of their landlords, for the majority of farm buildings in this neighbourhood are now one of the chief obstacles to good farm-

ing, being not only dilapidated, but constructed in such a manner as to tend more to the destruction than the preservation of the manure. In feeding cattle I would recommend every farmer to make himself acquainted with the valuable properties of linseed (boiled) and mixed with cut hay, straw, chaff, or other provender; it makes excellent food in addition to turnips, is generally relished by all descriptions of stock, and enables him to keep an increased quantity. But its advantages can only be fairly and justly appreciated by its being carried out in practice. Next comes the management of the manure made from the root crops, and notwithstanding all that has been said and written on that subject, the most barbarous practices are still in existence. I have lately seen drains cut across the manure in yards, to facilitate the escape of superfluous moisture arising from the want of spouts around the buildings. Previously to carting out manure, a good compost or layer of earth should be formed to receive it, to the depth of 18 or 20 inches, and where lime is used, it should be twice carefully turned before placing the manure upon it, for the good effects of lime are partially destroyed in forming composts for want of a more perfect incorporation of the materials. This done, I will suppose the manure intended for turnips to be placed upon the compost firmly pressed and well covered. Three weeks or a month before required for use, the heap should be turned, mixing with it one half of the compost, and again cover it over; about ten days after it should be again turned, every particle of manure being now separated, and thoroughly mixed with the remaining compost; it is in a great measure from want of proper attention in this respect, combined with careless hoeing, that turnip fields so frequently present such an irregularity of growth. Next, I would call your attention to the unprofitable manner in which our artificial grasses are consumed. Where artificial grass is required for fattening purposes, it might be cut up and mixed with a portion of boiled linseed; and at the early part of the season it is advisable to cut and mix dry provender with green food. This plan, more than all others (of mixing our grasses), would prove a great saving and increase the demand for labour.

T. MOTT, Esq.: Not being myself well versed in agriculture, it may seem presumptuous in my addressing this meeting; but no one can live in the country, particularly in these times, when the culture of the soil, with its liabilities and capabilities, occupy so large a portion of public discussion, without feeling interested. And I think it is the duty of every one to keep his eyes open, and report any experiments he may meet with for the benefit of his neighbours. I have been staying lately in Dorsetshire, which is not a county where one would expect to find an improved system of farming, as agriculture there has been, generally speaking, little attended to; but there is a striking exception in the farming of the Rev. Mr. Huxtable. He is a very clever experimental farmer, and has lately hired 230 acres, partly in the vale and partly on the down, on both of which he has tried many experiments, and, I believe, with great success. The down land, before it was broken up, was valued at 2s. 6d. per acre. The vale farm was in a most wretched condition for want of draining, in which he has expended more than £600. Now this may appear an extravagant sum, and you may consider Mr. Huxtable an enthusiast, but I can assure you that he is a plain, practical farmer—one, however, who has a thorough knowledge of chemistry, which is the foundation of all his experiments; and agriculturists have come from all parts of the kingdom to examine his farm, which I will now attempt to describe. He attributes his success wholly to shed-feeding his sheep and stall-feeding his cattle, which do not lie upon straw, but upon open splints. Large sheds are erected for the sheep,

holding from 50 to 120 each, the largest being divided into pens of ten each. They are roofed in, with a passage up the centre for feeding. Under the splints, the floor, which is excavated, is well puddled with clay, so as not to absorb the urine, and covered with sawdust, burnt clay, or dry mould, which receives the droppings from the animals. This manure is not removed till the spring, when it is carted away in almost a solid state, and drilled in with the turnips. The results have been most successful both in the health and well-doing of the sheep, the return having been nearly 2s. per head weekly upon each sheep. The same system is pursued in fattening his beasts, no straw being used except to litter his outhouses, the pigs laying on sawdust. By this means, an extraordinary quantity of cattle are kept. Six hundred sheep have been fattened without the use of hay, the straw being cut into chaff, with half a pint of oats or peas daily, over which ground boiling linseed is poured. The liquid manure from the beasts is removed to a large covered tank, from whence it is pumped and applied to the grass land or elsewhere. The result in the turnip crop is very satisfactory; for by this system he has succeeded in raising a crop of Swedes averaging nearly 25 tons per acre, on one of the most barren hills in Dorsetshire, the most unlikely spot having been selected for the experiment; and I have scarcely seen a finer crop this year in Norfolk. This improved system of farming must of course employ a great deal of extra labour. I understand Mr. Huxtable was paying £12 a week for labour on a farm not exceeding 230 acres, but he assured me that he was prepared to prove that the demand for labour was profitably increased. And, however incredible it may appear, I have no reason to doubt the truth of these statements. At all events, we ought all to be much indebted to Mr. Huxtable for making these experiments, for they plainly show that capital may be applied, and labour profitably employed, from an improved system of farming; and I think you will all allow that these experiments on grazing are of the greatest value just now, when, from the depreciation which may take place in the price of corn, the attention of the farmer must more than ever be directed to that which is the most important and the most profitable. Having thus endeavoured to show the benefits resulting from an improved system of farming, I must for one moment reverse the picture, and point out the evils of the opposite system; and I need not go far for an instance, as there are many to be found in that same county, Dorsetshire. In the Vale of Blackmore (a very few miles from Mr. Huxtable's) a friend of mine has some farms quite saturated with water, which he proposed to one of his tenants to drain, either finding all the labour himself and charging five per cent., or finding the tiles if he would find labour. Both propositions were declined, as the farmer was perfectly satisfied to go on as he had done for the last twenty years. Now I would ask, Is such a man fit to be a farmer? Do you think such a man, even if our worst fears are realized, can possibly be benefited by such a system? Would he not reap thirty per cent. by laying out his five per cent.? In other words, would not the demand for labour be profitably increased? Protection certainly has not benefited, and never can benefit, such a man; and I fear he is by no means a solitary instance. But mark the consequences: Here is a man, with the labourers around him calling (as Mr. Huxtable has justly observed) for labour and for bread; and he refuses to employ them, even when it might be done profitably to himself. The labourer is willing and anxious to work, but there is no one to hire him. A large supply, and no demand; and what is the consequence? The labourer is half-starved, and the land is half-cultivated. His miserable cottage and poverty-stricken appearance in many parts of the

county too plainly show that the rate of wages is generally very far below the average of the best cultivated districts. It is evident that such a state of things must continue wherever such a miserable system prevails: The land must be uncultivated, the tenant impoverished, the labourer degraded, until the agriculturist becomes persuaded, by the success of repeated experiments, that capital may be safely invested, and that alteration in his practice may be profitably made in order to increase the demand for labour.

A very animated discussion then ensued respecting those circumstances which affected the price of labour and the amount paid in the district.

Mr. THOMAS CUBITT, of Wilton, had examined his labour account, and found that during the last five years his labourers had received more than an average of 12s. weekly; and he thought the majority of farmers in this district would find their labourers exceeded that sum.

A BILL TO AMEND THE LAWS RELATING TO THE IMPORTATION OF CORN.

[Note.—The words printed in *Italics*, and the figures specifying the amounts of duty, are proposed to be inserted in the committee.]

Whereas, an act was passed in the session of Parliament held in the fifth and sixth years of the reign of her present Majesty, intituled, “An Act to amend the laws for the importation of Corn:”

And whereas it is expedient that the duties now payable upon the importation and entry for home consumption in the United Kingdom and in the Isle of Man respectively, of corn, grain, meal, and flour, should be altered, and that the act hereinbefore recited should be amended as hereinafter is expressed;

Be it therefore enacted, by the Queen's Most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, that from and after the *passing of this act* in lieu of the duties now payable upon the entry for home consumption in the United Kingdom, and upon the importation into the Isle of Man, of corn, grain, meal, and flour, there shall be levied and paid unto her Majesty, her heirs and successors, on all corn, grain, meal, and flour, already or hereafter to be imported into the United Kingdom or the Isle of Man from parts beyond the seas, and entered for home consumption after the *passing of this act*, the duties set forth in the schedule to this act annexed, until the *first day of February* which will be in the year of our Lord *one thousand eight hundred and forty-nine*, and on, from and after the said *first day of February, one thousand eight hundred and forty-nine*, the following duties; namely,

Upon all wheat, barley, bear or bigg, oats, rye, peas and beans, for every quarter *One Shilling*; and so in proportion for a less quantity.

Upon all wheat-meal and flour,
Barley-meal,
Oat-meal,
Rye-meal and flour,
Pea-meal, and
Bean-meal,

For every cwt. *Fourpence-halfpenny*; and so in proportion for a less quantity.

And be it enacted, that the several duties hereby imposed and leviable in the United Kingdom shall be levied, collected, paid, and applied in such and the same

manner in all respects as that in which the duties imposed by an act passed in the session of Parliament held in the eighth and ninth years of the reign of her present Majesty, intituled, “An Act for granting duties of customs,” are directed to be levied, collected, paid, and applied.

And be it enacted, that the several duties hereby imposed and leviable in the Isle of Man shall be levied, collected, paid, and applied in such and the same manner in all respects as that in which the duties imposed by an act passed in the session of Parliament held in the eighth and ninth years of the reign of her present Majesty, intituled, “An Act for regulating the trade with the Isle of Man,” are directed to be levied, collected, paid, and applied.

And be it enacted, that the average prices, both weekly and aggregate, of all British corn, shall continue to be made up, computed, and published, and the certificates of the aggregate average prices shall continue to be transmitted at the times and in the manner required by the said hereinbefore-recited act for amending the laws for the importation of corn; and the rate and amount of the duties set forth in the schedule to this act shall be regulated and governed, according to the scale in the said schedule contained, by the aggregate average prices so to be made up, computed, published, and transmitted, in the same manner as the rate and amount of the duties imposed by the said hereinbefore-recited act are by that act directed to be regulated and governed; and at each of the several ports in the United Kingdom and in the Isle of Man, the aggregate average prices, the certificate of which shall have been last received previously to the passing of this act by the collector or other chief officer of Customs at such port as by the said hereinbefore-recited act is directed, shall be taken to be the aggregate average price by which the duties hereby imposed shall be governed and regulated at such port, until the certificate of some other aggregate average price shall have been received by the collector or other chief officer of Customs at such port.

And be it enacted, that so much of the said act hereinbefore recited as prohibits the importation into the United Kingdom for consumption there of any corn ground, shall be repealed.

And be it enacted, that this act may be amended or repealed by any act to be passed in the present session of Parliament.

THE MALT TAX.

“ TO THE EDITOR OF THE NORWICH MERCURY.

“ DEAR SIR,—Although no friend to newspaper controversy, nor yet willing to apply to myself, personally, indirect attacks, yet I cannot allow a letter in your paper of last week to pass unnoticed; assuming that no other Norfolk farmer has been called upon to give evidence before a committee of the House of Lords, as to the burdens upon land, and, therefore, that no other person can be alluded to in Mr. Palmer's letter. In a mis-reported, or mis-represented speech of the Duke of Richmond's, his Grace is made to say, ‘ That he had been informed by a very eminent agriculturist that barley or barley meal possessed more fattening qualities than malt.’ The noble Duke is too good a judge of these matters for any one with common sense to have believed he ever made such a statement, as well as that he has in his possession documents which have been furnished him, both by my brother farmers from other counties, and also by myself, strongly advocating the use of malt for feeding in preference to barley. I now send you the speech of the Duke of Richmond from the *Mark Lane Express*, of which the following is an extract:—‘ His Grace said—He thought that within half an hour after leaving that House he could introduce to his noble friend one of the most extensive farmers from Norfolk, who had tried the experiments, and found that he could feed his cattle much better on malt than on barley.’ This purports to give a very different view of the case. I also subjoin a copy of my calculation upon feeding with malt, which I laid before the committee on Wednesday last, viz., I consider one peck of malt equal to 14lbs. of linseedcakes.

	£	s.	d.
“ A beast consuming one peck of malt per day will eat 5 qrs. in 23 weeks, which, with the duty, will cost.....	12	0	0
Without the duty	6	10	0
Difference	5	10	0
<hr/>			
14lbs. of linseedcake per day for 23 weeks, 1 ton, cost.....	9	0	0
5 qrs. of barley, at 26s.	6	10	0
5 qrs. of barley malted, at 26s.	6	10	0
<hr/>			
7 qrs. of barley, at 26s., equal to 1 ton of cake	9	2	0
5 qrs. of malt, at 26s., equal to 7 qrs. of barley.....	6	10	0
<hr/>			
In favour of malt	2	12	0
<hr/>			
1 ton of linseedcake	9	0	0
5 qrs. of malt, at 26s.	6	10	0
<hr/>			
In favour of malt	2	10	0

“ And at the same time and place I challenge to back my opinion against Dr. Playfair for 100 sovereigns, that I would fatten 50 or 100 beasts upon malt against the same number fed by the learned Professor upon barley meal, in the proportion of 5 qrs. of malt to 7 qrs. of barley meal.

“ Such are the statements which in ‘ *sober earnestness* ’ I have made, and which I hope may prove conclusive; so that Mr. Palmer will not be required to make the attempt to put ‘ *common sense* ’ into the farmers' heads, any more than his own, as I think they have manifested a much more stirring spirit than even the *one great unpaid*, who in the eleventh hour, even at the very time the division has taken place in the House of Commons, and a large majority obtained in favour of the removal of protective duties, comes forward as an advocate for the Abolition of the Malt Duty.

“ I am, sir, yours truly,

“ JOHN HUDSON.

“ *Castleacre, March 3, 1846.*”

MORETON-HAMPSTEAD FARMERS' CLUB.

TENANT' RIGHT.

The following resolutions were agreed to at the last meeting of this club:—

“ That it is the opinion of this meeting the present existing leases are not only injurious to landlord and tenant, but to the community at large; as they retard improvements of the land, and, consequently, diminish increase of production.

“ The tenure whereby tenants-at-will hold their estates is highly objectionable, having six months only to quit, ending with the year, and does require the interference of the Legislature to extend the time beyond that period, to enable the tenant to reimburse himself for the outlay of capital invested in the soil, or compel the landlord to take the interest of the tenant at a fair valuation.

“ That all permanent improvements ought to be borne by the landlord, and charge the tenant a fair interest for the capital expended; but where the tenant is at the whole expense of improvement, by the landlord's consent, he ought, at least, to be allowed fourteen years to repay him for the outlay, or be allowed in proportion to the time unexpired for compensation; and all improvements of the soil belonging to an outgoing tenant should be taken by the landlord at a fair valuation, and charged to the incoming tenant as an improved rent.

“ That a legal system of tenant-rights in accordance with the above would promote the interest of both landlord and tenant, and materially conduce to the advancement of practical agriculture, by giving confidence to the tenant to lay out his capital in improvement of the soil so as to cause a vast increase of production.”

Moved as an amendment, but lost by a majority:—

“ That this meeting is of opinion that the practice of letting land from year to year, or, as it is called, tenants-at-will, is bad in principle; and would recommend leases as long as convenient, and that remuneration be paid for all unexhausted manure at the end of lease.”

BEAN SETTING, &c.

BY JAMES MAIN.

As the whole of the month just concluded has been remarkably mild, and though generally wet, it has been, upon the whole, favourable for putting the bean and pea seeds into the ground. The month of January is always uncertain, and the ground generally heavy, and unsuitable for the operations of the plough and harrow. It is customary, therefore, to have the business of ploughing executed some time before January, in order that the soil may be mellowed by frost, and, if dry enough, be ready for broad-casting or drilling the seed. But as heavy land is best adapted for the crop, and as it frequently happens that such a soil is in a very soft and tender state at seed time, putting in the seed by dibbling is a very common and judicious practice.

This method of putting the seed into the soil is best adapted to the natural development of the bean. It requires a firm subsoil to fix its first tap-root into; and a very slight loosening of the surface suffices. Hence, the crop is always luxuriant on alluvial or clayey loams, which are well consolidated before the seed is deposited. The very action of the dibble in forming a cavity for the seed serves to compress the bottom and sides, into which the fibres of the roots readily strike and fix themselves. The seed is dibbled in rows eighteen inches asunder, across the lands by a line, and are placed three inches apart in the rows; the setters being paid by the acre, or by the quantity: in either case constant *superintendence* is necessary, lest the seed should be withheld, or too lavishly wasted. When a sowing machine is used, the drilling is performed lengthwise of the lands, leaving eighteen spaces between. Whether dibbled or drilled, a slight harrowing of the surface is desirable as soon as dry enough; and if the harrow cannot be used, covering with the hand-hoe must be had recourse to.

There are a good many varieties of this genus of pod-bearing plants, and which have been originated by accident, either in fields or in gardens. Hence, the largest podded varieties are called "garden beans," which are somewhat more tender and less prolific than the agricultural sorts, which latter are hardier and much more prolific for farm purposes. The sort which has been longest in cultivation is a native of Egypt and Barbary, and takes its name from a town or district in the latter country, namely, the Mazagan; which, being a dwarfish and early variety, is cultivated in gardens, and also in fields,

along with a few other varieties, having smaller seeds, and commonly called "horsebeans," from their nutritive qualities when split and mixed with oats or chaff for manger. These smaller sorts are the Heligoland, a Dutch variety; the tick, harrow, and the pigeon varieties, which are most commonly seen in Mark Lane and other corn markets; and are chiefly cultivated in the heavy-land districts of the kingdom. In some places, beans, wheat, and clover—the latter sown upon the wheat in the spring—is the invariable rotation; the land being kept free from weeds by the horse and hand-hoes during the growth of the beans; and in such cases it is not unusual to sow a sprinkling of tankard turnips before the last hoeing of the beans, which are pulled off before wheat seed time. In the same descriptions of clayey soils, horse-beans and hog-peas are often mixed, and sown broadcast together: the beans support the peas, and in favourable seasons this mixed crop is most abundant and remunerating. The grain is sold in market as polts; and the straw makes excellent winter fodder, whether for rack or manger, when cut into chaff.

Of peas there is also a numerous variety. The field sorts have purple flowers; and those of the garden varieties are white: some sorts of the latter are also cultivated in fields, either for podding and carried direct to vegetable markets, or harvested and sold for boilers. The field sorts are the horn-coloured or hog-pea, the maple, the blue, and the nimble. The last-named is a very early sort; for, if sown in April, the crop is ripe soon enough to be succeeded by turnips; which is a great advantage in most cases where the soil is suitable, *i. e.*, on a fine mellow loam. Early varieties of either peas or beans are particularly well adapted for admission into the rotation of cropping in agriculture; for when the first can be got off time enough for turnips, the last would not delay getting in the wheat-seed in due season. Procuring the earliest kinds of both these sorts of pulse is always, or should be always, a special object of a farmer; and such varieties, we have still to look forward with hope, may be originated by the art of cross-impregnation.

Hog-peas and Tartarian oats are sometimes mixed and sown together, and generally successfully; especially if sown on land in good heart. The heaviest crop I ever saw was a mixture of peas and Tartarian oats, and the most valuable the owner ever cultivated.

Potatoes and beans are sometimes planted in the same drills; but this is more a cottage-garden practice than a farmer's expedient, though it is a double-crop not to be despised.

The cultivation of dibbled or drilled beans consists chiefly in keeping the spaces between the rows well broken up, either by the horse or hand-hoe, throughout the spring and summer months: for keeping drilled crops free from weeds is a principal advantage of drilled crops. And if the black aphides attack the crop, employing women and children to top the plants would be of great service, not only in the destruction of the insects, but it will actually expedite the ripening of the pods. This is more a gardener's than a farmer's point of practice; but there is no reason it should be confined to the garden when a field-crop may be improved by so simple a means.

The various descriptions of pulse, or pod-bearing plants, are of the greatest service to mankind, not only as human food, but for fattening and supporting domesticated animals. Horse-beans, when crushed, are not only the most nutritious food for that useful animal, but it is said that the best London flour for the baker cannot be properly manufactured unless some portion of bean-meal, and of barley too, be intermixed with that of wheat. This is a miller's secret; and they are perfectly justified in improving their goods by admixture of any wholesome ingredient.

Beans, peas, vetches, and tares, all bear edible, and none of them poisonous seeds; are all used as dietetic vegetables in one part of the world or another. The chich-pea is a native of the south of Europe, and commonly cultivated there as an article of food: so is the ram's-head-chich; both of which are eaten either raw or boiled. French cooks prefer them to haricots, when dried for winter use.

Lentils is another pulse which has been esteemed as human food from a very high antiquity. When boiled, they readily dissolve into a pulpy mass, of a chocolate colour; and in days of yore constituted the mess of "red pottage," for which Esau sold his birth-right! In Egypt and Syria they are parched over the fire in pans, and are considered by the natives as the best food to be taken on long journeys. Three varieties of lentil are cultivated in Italy, France, and Germany; and their use is very common, especially by the Roman Catholics during Lent. Lentils are also imported to London from Hamburg, for the use of cooks, who prize them as an ingredient in sauces and soups.

The garden sorts of pea are numerous, and new varieties are brought into notice and cultivation in almost every year; some of which are well worth

the attention of farmers, to sow for boilers, and to be succeeded by turnips or winter tares. Garden peas, though every where so plentiful now, were, in Queen Elizabeth's time, annually imported from Holland for her majesty's table; as the first green peas produced in the open air are now received in Covent Garden from Lisbon.

There is another tribe of pod-bearing plants which are agricultural in warm climates, but too impatient of frost to be cultivated in this country except in gardens. This tribe contains the sweet-peas, everlasting peas, &c.; also the bitter-vetch, and the various sorts of kidney-beans. These last are the most useful as culinary vegetables: the green pods of both the runner and dwarf varieties are used at table either plain-boiled or pickled. On the continent the ripe seeds are principally used under the name of haricots; and they enter into the composition of soups and many other dishes. They are relished by all classes, and cultivated in fields; and on account of their plenty and extremely low price, they form a considerable proportion of the food of the poor throughout France during the winter. It would appear from the analysis of chemists, that the kidney-bean is the most nutritious of all pulse, though not the most inviting to domestic animals; as they are rejected even by the hog before they are dressed.

Besides the common haricot and scarlet-runner there are several other species which afford esculent seeds, and much used in India and the surrounding countries. And in Britain the scarlet-runner is certainly one of the most useful summer vegetables that can be grown in a cottager's garden.

Dolichos is another pod-bearing genus of pea-like plants. The one called sooje yields seeds, of which the favourite sauce called soy is made, and which is preferred to the kitjap of China. Both are imported into England in large quantities, and sold as soy. Several other species of dolichos yield eatable pods and seeds; but they are exotics.

Lupins are a congenerous family of pod-bearing plants. In Italy, the white and yellow lupins are grown for fattening cattle, or cut as green fodder, or grown for ploughing in, to ameliorate the land, to fit it for bearing a crop of clover.

But of all the various kinds of pulse found in different parts of the world, experience has already taught which are best adapted for British cultivation and purposes: and though the most of them are foreigners, they are now completely naturalized to our variable climate.

There is one property of the bean which may be noticed, namely, the facility and safety with which the young plants may be transplanted. This property is more available in the garden than in the field; though in the latter it may often be an useful

and profitable job for the odd man or boy to make good the blanks which, from careless dibbling or drilling, may occur in the field. For this purpose a seed-bed of a square yard or two is made in any bye-corner of the garden. On this the seed is sown thickly in January; and in April they may be transplanted to the required station. This manœuvre is particularly convenient when the ground on which the bean-crop is intended to grow is pre-occupied by a crop not yet cleared off, or not yet ready for the bean-seed. Another circumstance which constantly attends a transplanted crop of either common or kidney beans is not only the ease with which the seedlings may be protected from frost or other inclement weather, but it is invariably found that the plants so removed yield their pods both earlier and in greater numbers.

Recommending garden practices in an agricultural work may be thought a very useless piece of advice; but it is universally admitted that the

nearer the processes of farming can be profitably assimilated to those of gardening, the more successful will be the farmer's labours. And in the present uncertain state of British agriculture many new expedients must be had recourse to, especially in the culture of all sorts of culinary vegetables; for money drawn from Covent Garden will be equally acceptable as that received from either Smithfield or Mark Lane. Cultivating pure sorts of seeds for seedsmen; green tares, rye, and Italian rye-grass for highly-kept horses; mangold wurtzel for cow-keepers, &c., are all objects which meet a ready sale near towns: and though such crops have been for many years confined to the near neighbourhood of London, distance is now banished by the railroads; for produce raised at the distance of 100 miles away may be as soon in any eligible market as if produced in its immediate neighbourhood.

Old Brompton, March, 1846.

THE EPIDEMIC FROM THE COW TO THE HUMAN BEING.

BY MR. R. FOSTER, GOSBERTON

The subject to be now considered is a cow of the short-horned breed, belonging to Mr. W. Smith, spirit-merchant, of Surfleet. She was taken very ill on the 4th of September, and I was requested to see her. When I arrived, I found my patient labouring under the following symptoms:—loss of appetite, staring coat, arched back, heaviness of the eyes, sore mouth and sore teats, and with all the symptoms generally attending the prevailing epidemic.

I gave her aperient and febrifuge medicine, and applied a mild digestive to the teats, and ordered the owner to keep the affected parts clean, and to be careful in milking her, which was done with great difficulty.

20th.—I found my patient much the same as on the preceding day, and continued the medicine.

21st.—A little better. Treatment as usual.

22nd.—Continues to improve. The female that had been milking her could do so no longer, in consequence of the teats becoming so painful as to make it difficult, and almost dangerous, for a female to attempt it; therefore, one of the men-servants was obliged to take the care of the diseased udder.

About a week after the cow had recovered from her illness, the same young man asked me what he should do to his hands; "for," says he, "the old cow has given me the epidemic."

I said "No, you must be mistaken;" but he said he was not, for the female that had milked her before had had her hands affected the same as his. I then asked him whether he had been ill? He said, No, he had not been ill, only his hands and arms were very much inflamed; so much so, indeed, that he could get his coat off and on with great difficulty. He said his hand felt so heavy and full of pain, that he was obliged to have it in a sling.

After the inflammation had somewhat abated, his hand came out full of large pustules, some of them containing pus, and the others a fluid, which ultimately spread over the whole surface of the hand and fore-arm, separating the cuticular parts. He complained of the left hand being much the worst, and asked me the reason. I then asked him whether he had cut any of his fingers? to which he replied, Yes, he had cut one of them with a straw. He also said that it smarted very much when the dressing of the affected parts took place, which I said I thought was the cause of that hand and arm being the worst. Now, in my opinion, the two cases here recorded are sufficient to prove them cases of communicated epidemic, and having a greater effect by inoculation.—Veterinarian.

HARLESTON FARMERS' CLUB.

EIGHTH ANNUAL REPORT, 1845.

Your committee having revised the minutes of the past year, proceed to lay before you their report thereon. They can but express their gratification that the suggestion contained in our last year's report has been carried out so satisfactorily, viz.—“a very close attention to the nature of the questions to be in future proposed for discussion.” We then expressed our opinion, that with such a course it would not be difficult to obtain good attendance at our meetings. This opinion has been so strongly and literally fulfilled by the present year's experience, that our hopes have been raised, and our minds at length enlightened, by the convincing facts of full attendances, and new members adding themselves to our list of subscribers; that our brother farmers are beginning to understand the true principles of a Farmers' Club; and that institutions like these, together with the publication of their experience and the perusal of agricultural works, will do much to promote that general circulation of knowledge which must in every case precede the adoption of an amended system of cultivation. We are well aware that the necessarily insulated position of the farmers precludes them from such frequent intercourse and communication with each other as are enjoyed by the inhabitants of towns; but insulated as we are, if we can but bring our minds to the conviction that we are far, very far, from having arrived at perfection, we shall have gained the first step towards an amendment; for with such a conviction there will be a commensurate desire for information, which will not and cannot be satisfied by comparing our practice with our neighbour's adjoining farm, in the contracted sphere of our own parish, but by the farmers of a district, who will meet together, and who will call the attention of their neighbours to improvements which have been introduced with success in other neighbourhoods—thus adding the stimulus of a fair rivalry and honourable ambition to the dictates of interest.

The first meeting, on the 18th December, 1844, was appropriated to the appointment of the committee for the present year, the arrangements of the various subjects for discussion, with the times and places of meeting, together with the future custody and management of the library.

The second meeting, on the 15th of January, 1845, was very fully attended. Two new members were added to the list.

The chairman then called upon the member to introduce the subject for the evening's discussion, viz.—“The damage caused by hedge-row timber;” who brought forward his own experience, as the most convincing proof he was in possession of, of the incalculable injury he had received from trees growing in fences; their roots and shade being a constant source of deterioration to his crops. The previous dry summer more fully exemplified this than any year previous. He had fences where trees abounded, where the soil, on an average of eight yards in width, was rendered almost worthless; their value if cut down did not exceed sixpence a tree, and the topplings they afforded to the tenant were not worth more than sixpence each, in ten years' growth. The roots of elm trees he had particularly noticed upon mixed soils, extending as much as sixty yards upon the surface; he also noticed the constant expense incurred by the tenant in the breakage of implements by coming in contact with their roots. With all these various evils accruing to the tenant from the timber and old worthless pollards growing in the fences, he felt confident that landlords only required to be well informed of the injury which the producer of corn received from them, to do away with such nuisances.

This introduction was followed by many other members, who pointed out instances where the trees had caused the greatest injury. One member, after noticing the important nature of the subject, said he deemed it one of the most fertile for grievous injury which the tenant could bring forward. He noticed particularly two ash trees upon his own occupation, which did him a yearly damage, upon a very low calculation, of 6s. each, and both trees were not worth £5; but the landlord admired them too much to take them away. Some few years since, timber was of that value that it seemed desirable to protect it, at almost any cost; but now that timber is so cheap, and the tenants' liabilities so heavy, he thought it most desirable that the whole grievance should be plainly stated, so that the landlord might be made aware of the enormous injury occasioned to the tenant. As to the old pollards, he had no hesitation in asserting their utter worthlessness, for he had an instance under his own management, where a large quantity had been sold for firewood, which actually did not pay the man who bought them for converting. Another instance he had seen where the farmer

would never apply manure where he saw the old trees would destroy its value; and in these times, when we are so often told to "improve your soil," "grow more corn," in order to meet your expenses, in common fairness we should tell our landlords, "Do away with these drawbacks upon our industry, give us a fair open field for the growth of our crops; do not let these old trees take away the benefit which we reasonably expect to derive from our manure and our labour, and then we may be enabled to grow corn where now the soil does not actually pay for seed and tillage." He believed that some landlords calculated that growing timber in a hedge-row would pay him one shilling per acre; but even presuming this to be true, upon very poor land, properly prepared and planted, they would pay double that, and be of infinitely more value, for in hedge-row timber the pruning-hook was so often used to lop the under branches, that the timber was spoiled in quality; but in a plantation they would prune themselves by the under branches gradually dying off, without having to resort to the pruning-hook.

Another noticed the necessity which compelled the tenant to speak out upon matters which pressed most heavily upon him. He now suffered in every possible way: by many leases the covenants prevented him from lopping at all except at the permission expressed in writing by the landlord. The injury caused by the prevention of a due circulation of air to dry the corn was most trying, particularly in moist seasons. A field of five acres he occupied had the roots of elm trees from the fences actually meeting each other in the middle of it. How, he would ask, could the occupier make his industry and capital pay their fair returns with such a nuisance? He did not wish to see the country denuded of timber; but let it be fostered where the tenant did not rent the land, and then the landlord would properly understand how its growth paid him. The one fact, that the roots of trees were an almost insuperable obstacle to tile or indeed to any other drainage, would surely shew the landlord the necessity of abating an impediment to one of the greatest improvements of land in the present day. Other members corroborated the fact of the roots of elms running to the middle of small enclosures of four or five acres; and a curious but important fact was stated of a drain 6ft. deep with a bore of 6 in. having been completely filled up and rendered useless by the small fibres from the roots of trees.

The many serious evils to the tenant appeared to be the want of a due circulation of air for the growth of corn and root crops, the great quantity of dross corn occasioned by them, the breakage of implements, and more particularly in moist seasons

the utter impossibility of harvesting the grain in a marketable condition, without removing it to more open fields for that purpose, which occasions very great loss of time at an important season of the year, as well as much corn shed and wasted. After a very long and interesting discussion, the following resolution was carried unanimously—viz.:

"That in the opinion of this club the hedge-row timber and pollard trees are an incalculable injury to the tenant farmer, in the deterioration in quantity and quality of his corn and other crops, in the prevention of a proper circulation of air for the due ripening and harvesting the crop, in the breakage of implements, and by their acting so perniciously by their roots against tile draining.

The following resolution was also passed, as it appeared desirable that the resolutions arrived at at the monthly meetings should be made public as soon as possible—viz.:

"That the secretary be requested to send, immediately after every meeting of the club, a copy of the subject for discussion at that meeting, and the resolution arrived at, to the *Mark-Lane Express*, the *Gardeners' Chronicle*, the *Norwich Mercury*, and *Bury Post*."

The third meeting held on the 19th February, 1845. Two new members were added to the list of subscribers; and the secretary was requested to have the numbers of the *Farmer's Magazine* collected and bound in volumes, and to make a fresh catalogue of the books belonging to the club. The subject for the evening's discussion was then introduced by the member whose name stood on the card for that purpose—viz.:

"The expenses of cultivating a heavy land farm, one-fifth pasture, the rest arable, on an average of eight years."

For the purpose of opening the question for discussion he would confine his remarks and statistics to a farm of 125 acres, 100 acres arable and 25 acres pasture. He did not intend to enter into the detailed expenses of cultivating each crop, but to confine himself to the expenses of an establishment, of manual labour, horses, interest of capital employed, rent, tithe, tradesmen's bills, seed corn, small seeds, &c. For the capital employed, which he would take at £1,000, he allowed £8 15s. per cent.; and not to charge the occupier's superintendence amongst the expenses, but consider him to be remunerated by the extra interest allowed for the capital. This he thought would be better than attempting to calculate what the tenant could live for, which would involve such an endless variety of opinion. He would base his calculations, then, as if the farm was farmed off-hand.

The supposed capital being 1,000 <i>l.</i> , with interest at 8 <i>l.</i> 15 <i>s.</i> per cent., would give as the			
first item of expenditure	-	-	- £87 10 0
Rent at 25 <i>s.</i> per acre	-	-	- 156 5 0
Manual Labour—			
One horseman weekly, at 10 <i>s.</i>	-	-	- £0 10 0
One strong plough lad, at 6 <i>s.</i>	-	-	- 0 6 0
Two labourers, at 10 <i>s.</i> each	-	-	- 1 0 0
One boy at 3 <i>s.</i> , and one at 2 <i>s.</i>	-	-	- 0 5 0
<hr/>			
These will make the weekly labour	-	-	2 1 0
for 52 weeks	-	-	106 2 0
Extra for weeding 62 acres of corn, at 1 <i>s.</i> 2 <i>d.</i>	-	-	3 12 0
Ditto in haymaking season, 20 acres, at 3 <i>s.</i> 6 <i>d.</i>	-	-	3 10 0
Ditto in harvest-	-	-	20 0 0
Ditto for claying	-	-	3 0 0
Ditto wheat setting	-	-	4 10 0
Ditto drilling	-	-	2 10 0
Ditto chaff cutting	-	-	4 0 0
Ditto hay trussing	-	-	3 0 0
Ditto journeys	-	-	1 5 0
Pulling and storing root crop	-	-	4 0 0
Mole-catcher, rat-catcher, and thatcher-	-	-	3 10 0
<hr/>			
			25 15 0
			159 9 0
			£403 4 0

He considered that a farm of this size, of moderately heavy land, would require five good horses : their keep he thus calculated per week :—

To each horse 3 trusses of hay, at 3 <i>s.</i> per cwt.	-	-	-	0 4 6
And 4 st. of corn 4 <i>s.</i> , and 1st. pollard 8 <i>d.</i>	-	-	-	0 4 8
<hr/>				
This will be 9 <i>s.</i> 2 <i>d.</i> weekly; for 35 weeks	-	-	-	16 0 10
Tares and clover, 17 weeks, at 2 <i>s.</i> 6 <i>d.</i>	-	-	-	2 2 6
Wear and tear, 52 weeks, at 1 <i>s.</i>	-	-	-	2 12 0
<hr/>				
				20 15 4
				5
				103 16 8
Poor rates at 3 <i>s.</i> , church and road at 1 <i>s.</i> 2 <i>d.</i> ==4 <i>s.</i> 2 <i>d.</i> per acre	-	-	-	26 0 10
Tithe rent-charge at 6 <i>s.</i> per acre	-	-	-	37 10 0
Tradesmen's bills, Blacksmith	-	-	-	9 0 0
„ Wheelwright	-	-	-	4 0 0
„ Harness Maker	-	-	-	3 10 0
„ Farrier	-	-	-	2 0 0
„ Carpenter, 4 weeks	-	-	-	2 16 0
Hurdles or netting	-	-	-	1 14 0
Sundries in household and dairy	-	-	-	2 12 0
<hr/>				
				25 12 0
Seed corn for 25 acres, wheat, 12 co., at 25 <i>s.</i>	-	-	-	15 0 0
„ 25 acres, barley, 20 co., at 14 <i>s.</i>	-	-	-	14 0 0
„ 12½ acres, beans, 8 co., at 16 <i>s.</i>	-	-	-	6 8 0
Small seeds, 12½ acres, layer, at 10 <i>s.</i> per acre	-	-	-	6 5 0
„ 25 acres, beet and turnips, &c.	-	-	-	3 0 0
<hr/>				
				44 13 0
				£640 16 6
Add Insurance	-	-	-	1 0 0
<hr/>				
				Total - £641 16 6

He begged to be distinctly understood that he had based these calculations upon the *common* mode of cultivation in heavy land districts, without any reference to the extra expenses which in many cases are incurred in the purchase of artificial food or artificial manures ; and having thus submitted his

statement, he would be most willing to enter further into detail on any part which the club might point out.

A member observed that the calculations were made upon the gross average of the farm. He thought that some allowance should be made for

waste. He also objected to the rate of interest as not being sufficiently high; the labour account being 25s. 6d. per acre, and previous resolutions, passed by this club, going as high as 30s. would appear somewhat inconsistent; but he found the proposer of this statement had qualified his statistics upon the labour by stating it to be only on the common mode of cultivation.

Other members noticed the amount per acre on labour as not being sufficient; and the proposer of the question himself said that with regard to his own labour-account he found that he was expending as much as 36s. per acre; but he could not take his own as any fair criterion, as he was so much from home, and had consequently to trust so much to others, that he believed he did not reap the full benefit of the labour he employed.

One member noticed the discrepancy between the proposer's labour-account on his own occupation, and the calculation he had laid down as sufficient for the 125 acre farm. He would ask this question: Would it be possible so to reduce the 36s. labour account (*i. e.*, to 25s. 6d.), and to give then a fair state of cultivation and produce? But supposing it to be admitted that the 25s. 6d. per acre is sufficient for the commonly fair cultivation alluded to, would it not be fair to add some extra expense for getting the farm into a fair state? He fully believed that an additional 5s. per acre expended in labour would give one coomb per acre more in the produce upon the whole farm: indeed, this club had already assumed, from previous calculations and other sources, that there is quite that difference between the *well cultivated* and the *average cultivated* farms in the district. He noticed some observations which had been made by other members as to the amount per acre of the labour-account, and in reference thereto he would name the fact of a large heavy-land parish in this neighbourhood where a recent calculation had been made, and where the number of working hands were accurately known; and there, allowing 10s. weekly to every able-bodied man, including thirty working farmers, boys of all ages capable of work in the same proportion, the result did not give 20s. per acre expenditure for labour; this proof would therefore quite settle the question of labour as to the amount per acre in the calculation laid down being sufficient for commonly cultivated farms. And with regard to the tradesmen's bills, we could each and all of us refer to our own accounts, which would lead us to an accurate result; but even then he did not quite see how this question could be brought to a satisfactory conclusion without a corresponding statement as to the produce of such a farm under such *common* cultivation.

The chairman, in adverting to the labour-account, was of opinion that a much greater loss would ac-

crue to the occupier by the outlay of the 25s. than by the greater outlay of 36s. It had been observed that one coomb per acre more could be grown by the proper application of labour: he fully believed this from practical experience. Assisted by good tillage and good implements, labour judiciously applied with the manure made upon the farm, the coomb per acre might be added to the produce; and in the parish just alluded to he believed it might be fully carried out.

Many others joined in the discussion of the various points laid down; but as it appeared that it would be very desirable to compare the actual experience of the members with these statistics, it was a generally expressed wish that the subject might be adjourned to another meeting before coming to any resolution. Several members expressed a strong desire that the question might be carried fully out by shewing the produce of such a farm, so that it might be shewn to the world the true position of the tenant farmer. This would shew how the occupier of the soil stood as to his expenditure, and the value which he received for his produce. But although so many expressed this wish, yet no one could be prevailed upon to produce such a statement.

The proposer of the subject replied to the various arguments and objections he had heard. With regard to the discrepancy which had been noticed between his own outlay for labour and the amount he had laid down in the calculations, he would state that in his own opinion he had made too great an outlay, or in other words, the outlay wanted more personal management than he had been able to give to it. He could not agree to any addition being made to the labour-account for the purpose of getting the farm into a fair state, as less labour is employed when the tenant knows he is about to leave the farm, and the land is consequently again getting out of trim; and with regard to the coomb per acre more being grown by application of labour, he would only revert to the opinion of the Kentish farmers, who are most decided in their view of the case, that a coomb per acre is all the difference that can possibly be made between the fair and the best cultivation, and that this could not be done by labour alone. He still believed he could keep the farm in the common, fair cultivated state with the 25s. 6d. per acre; but he would most willingly consent to have the question adjourned for further discussion, which was accordingly done to the 12th of March.

Adjourned meeting held 12th March, 1845.—Owing to the extreme inclemency of the weather there were only twelve members present, and the proposer of the subject at the last meeting said that he was now quite prepared to go into the detail of the various items then laid down, and he hoped

that the experience of those present would enable them to come to a satisfactory conclusion. The amount of capital was allowed to stand as first proposed, at £1000. The interest upon that capital was very strongly objected to as being insufficient for the livelihood of the tenant, let him live as closely as he would. Some considerable degree of difference existed upon this point; and as it was found that such would always be the case where it was a matter of opinion only, it was suggested that it would be much better to charge only the actual amount of interest which the capital could at the most command if employed elsewhere, and leave the livelihood of the tenant entirely out of the question. The account would thus shew the precise amount of expense incurred in the cultivation.

The suggestion was very generally concurred in, and it therefore was put at £5 per cent. upon the capital=£50. The amount for manual labour appeared more particularly to have engaged the attention of those present since the last meeting; various accounts had been referred to, and the amounts were all higher by 1s. 6d. or 2s. per acre than the statement shewed. The proposer said that he had since the last meeting worked his labour-account over again, and he found various little items left out, which would raise it to £166 3s. 5d., at which amount it was allowed to stand.

Many instances of tithe rent, charge having been quoted as high as 7s. and 8s. per acre, the amount was raised to 6s. 6d. as a fair average. Some slight additions were made to the tradesmen's bills; and as no calculation had been shewn or mentioned of the wear and tear and depreciation of implements, and as market expenses and other little incidental charges had been left out, it was finally arranged that £10 should be added to the account for that purpose, and the following resolution was agreed to:—"That it is the opinion of this club that the expenses of cultivation on a heavy land farm of 125 acres—100 acres arable and 25 acres pasture—at a rental of 25s. per acre, with wheat at 25s. per coomb, would be as follows, upon an average of eight years:—

Interest on 1000 <i>l.</i> capital, at 5 per cent.	£50	0	0
Rent on 125 acres, at 25s. per acre.	156	5	0
Rates—poor, road, and church, at 4s. 2d. per acre	26	0	10
Tithe rent-charge, at 6s. 6d. per acre	40	12	6
Labour	166	3	5
Keep, and wear and tear of 5 horses	103	15	0
Tradesmen's bills	27	12	0
Seed corn and seeds	44	13	0
Wear and tear, and depreciation of im- plements, market expenses, and small incidental charges	10	0	0
Insurance	1	0	0
Total	£626	1	9

The next meeting was held on the 19th of March, 1845, when there was a good attendance of members. At this meeting it was resolved unanimously, "That the members of this club be each allowed to take one friend to the reading room at any time of its being open."

The subject for the evening's discussion was "On the most judicious plan of commuting fixed payments into corn rents, and the general advantages of the latter." The member who introduced the subject said that he should make but few observations on the value of corn rents over fixed money payments, the club having previously sanctioned the principle of the former. They were all agreed that with long leases only could the best cultivation be expected; and with the present prospect of fiscal changes, who would dare to take a long lease, calculated on existing prices? Changes of price from the variation of seasons, or in other words from a good or bad crop, might perhaps be met by a fixed money rent; but those arising from legislative interference could only be guarded against by a rent fluctuating with the prices of produce. The present price of wheat, 45s. per quarter, is 20 per cent. below the act of parliament price of 56s. per quarter; and at McCulloch's estimate of 34 millions as the rental of the kingdom, the loss to the occupiers would be £6,800,000, a large portion of which would have been saved to them by a fair corn rent. The objectors to corn rents relied chiefly on one argument, which it is necessary to meet, and in considering which, we may probably arrive at our object of this evening—viz., the best plan of carrying corn rents into effect. It is this: A high price of corn arising from a short crop would cause a high rent when it could be least afforded; and *vice versa*, a low price from an abundant crop, a low rent when a high one could be paid. If this objection cannot be obviated, it is fatal to corn rents; but it at once suggests that our rents must not be governed by the price of one kind of corn only, nor perhaps by the price of one season only; but the latter is a point admitting of some discussion. It rarely happens that the crops of wheat and barley are equally bad or equally good, and the prices of them consequently equally high or low. By commuting the rent, then, into more than one kind of grain, the difficulty alluded to is overcome, a proof of which is seen in the tithe commutation, the proposers of which ran into the opposite extreme, and the consequence is, we do not obtain the high or low tithe with the high or low prices which govern it, but are paying a high tithe with a low priced produce, and may perhaps pay a low one with corn at higher rates. His first proposition then would be, that a corn rent should be fixed on those crops to the growth of which the soil is congenial—wheat

and barley—wheat and beans—wheat and oats, &c. In this district the former. Having decided on the crops, there are two ways of commutting the rent, viz., into an equal *value* or equal *quantity* of them; he preferred the latter. But the better to explain this, he would suppose a farm to be taken of the same size as that on which the calculations for the last subject discussed by the club were based—viz., 125 acres of land, one-fifth pasture, at a rent of 25s. per acre, fixed when wheat was 25s. and barley 15s. per coomb; the sum to commute will be £156 5s. This, at equal *values* of wheat and barley, would be 62½ coombs of the former, and 104 of the latter; at equal *quantities* 78 coombs of each. He thought it fairer to both landlord and tenant to take the latter. The annual value, then, of 78 coombs of wheat and 78 coombs of barley will be the rent of the farm in question. We must now decide *what* averages shall govern the rent—viz., whether of the kingdom, of London, or of the district—and over what *period* they shall be taken. He thought, as regards the former, that the average price of the market where the produce of the farm is sold, is that which should govern the rent. Under the present very imperfect system of taking the averages, those for London are increased by a variety of expenses incurred in sending the corn to that market and selling it, forming a serious addition to the price received by the grower; and those for the kingdom are, on the other hand, deficient by a large proportion of the growth not being included in the returns, not to mention that the objection which applies to the London averages applies with still greater force to those of the kingdom, inasmuch as they contain the returns of so many large consuming markets, where sales and *re-sales*, with freights, charges, and commissions, have added considerably to the original price. These objections do not apply to the returns from the market where the produce is sold; and besides, it is most fair to govern the rent by the prices of that market at which, if the owner had farmed the land, he would have sold the produce. It unfortunately happens that at some markets there are no averages taken, and he could not but here express his regret that a better system of making these returns is not in force. Why should not *all* the corn sold be returned? Why should that purchased at Bungay and Harleston go into the averages, and that sold at Halesworth omitted? In the present returns each seller's name and quantity is distinctly entered, and to discover fraud all those *sellers* must be questioned. If the growers made the returns, there would be no more entries than at present, and it would be necessary to question the *buyers* only, comparatively few, to discover erroneous returns, whilst the opposite interests of the

parties would check collusion. We should thus possess, with little extra trouble, a statistical document of the greatest importance, viz., a correct account of the annual growth and consumption of corn. As regards the period over which the averages to govern a corn rent should be taken, he had found some difficulty in coming to a conclusion. That for seven years, by which the tithe rent-charge is regulated, is decidedly too long, as we do not feel the boon of reduction when we want it; and of this the present season is a strong case in point. Many persons think three years would be better for the tithes, and the same for the rent; but if we take two crops, he thought one year would be better than three; and if it is taken from Michaelmas to Michaelmas, some portion of the crop which pays the rent would be included in the returns. He had now an important point to suggest, viz., that our corn rent should have a limitation—that it shall not vary to the extremes of high or low prices. It is our object, and he might truly say it is one which never has been lost sight of in the discussions of this club, to consider the interests of the owner as much as those of the occupier. To a pure corn rent the former might have an objection, that he could not calculate with any degree of certainty what his income would be; but if the scale be limited, say to 5s. per coomb each way from the pivot price, no more rent would be deducted or added than may fairly be called the landlord's share. For instance, if wheat should fall to 20s., and barley to 10s. a coomb, the rent of our farm would be reduced from £156 5s. to £117, or 25 per cent.; if wheat falls to 17s., a price at which we have seen it, and barley to 10s., the rent would still be £117; and in the same way no advance in the prices of corn would add to the rent more than 25 per cent.; but how seldom would the prices of both wheat and barley rise or fall in the same season to the limit price? Take the present season as an example, and suppose the rent of our farm to have been fixed when the present corn law was passed, and we were led to expect 28s. per coomb for wheat, and 16s. for barley being the pivot price—if the average price of wheat this year should be 22s. 6d. per coomb, we should pay on 23s. the limit from 28s., and barley say at 16s.; the rent then would be £136 15s., or a reduction of £19 10s. He might be told that this is a very inadequate sum to meet our present losses. True—but is it not the landlord's share? None of us are unreasonable enough to expect him to make up all our deficiency. As a further assistance, we must endeavour to obtain a similar reduction on our other expenses. The tithe is in fact a corn rent; but as before observed, the seven years' average prevents our feeling the benefit of the plan when we want it.

Our labour, however, partakes in some measure of the principle of a corn rent—the value of a bushel of wheat, with 2s. 6d. or 3s. per week added, considered a fair standard for labour; at the present prices of wheat, this would put two-thirds of the cost of labour on a par with the price of corn—thus if the 125 acres of land costs 30s. per acre for labour, with wheat at 28s., say £187 10s., it would cost only £163 15s. with wheat at 22s. 6d. per coomb, because the 90 coombs of wheat which it took to pay two-thirds of the labour would be worth, would in fact have sold for only £101 5s., instead of £126. Tradesmen's bills, another portion of our expenses (he left horse-keep out, because the price of the portion of produce they eat is immaterial), cannot be equally reduced by a low price of corn, as their charges depend somewhat on the price of the raw materials—wood, iron, or leather; but that portion of them comprised in journeymen's wages, would probably partake somewhat of a decreased price of corn. At any rate, he was disposed to ask the landlords for their share only, to enable us to meet such unexpected changes in price as legislation (might he not say their legislation?) brings upon us. He had now laid his plan before the members, and if it was found to meet their views, he should be prepared to produce a resolution on the question.

One member said he agreed in the general view of the matter as laid down by the proposer, but thought there was some objection to the guidance of one year's average for the payment of the rent, for it might so happen that with a very short crop and a high price we should pay the highest rent when we were the least able to pay it; he thought a three years' average would obviate this.

Another agreed to the system of limitation, but did not like the working of the annual change of payment. He suggested that certain stops might be appended to the scale which would facilitate the working; for instance, making an alteration when corn fell 2s. 6d. per coomb, and then another when it fell 5s. He hired his farm on a fluctuation of 4s. but this he thought too much. He was strongly of opinion that the frequent fiscal alterations of the present day call loudly for corn rent upon some such principle as the present.

One member observed that he had imagined the terms of the notice for the discussion of this question alluded to a pure corn rent, and upon this view of it he had based his calculations. With the limitations as introduced by the proposer it is not what is called a pure corn rent. Adam Smith defines a corn rent to be "a certain quantity of corn, or the price of it, for a certain quantity of land;" and he confessed, that before he had entered at all minutely into any calculations on the subject, he

had approved of the principle of a corn rent; but after working out his calculations, he found it would not work at all well. A very old writer upon this subject, Gregory King, anticipated that the falling off of one-tenth of the crop would give a rise of three-tenths in the prices. He, however, would not go to that length, but would shew to the club, by a calculation based upon very probable circumstances, that a corn rent could only be met by the tenant when corn was very low in price; and on the contrary, when it was high in price from a short crop, the tenant would be in a worse position than he now is.

Ex. 1.—Take 100 acres of arable land, and suppose the corn rent to be at the rate of the price of one coomb of wheat per acre; and suppose, on a shift of 25 acres, the crop to be ten coombs per acre, and the price 20s. per coomb, the quantity grown would be 250 coombs, which would be equal to

The rent would be..... 100

Surplus 150

Supposing a fixed rent of 25s. per acre, or £125, the surplus would be £125; only shewing a difference in favour of corn rent of £25.

Ex. 2.—Upon the same quantity of land, and corn rent as above, 25 acres of wheat, grown at eight coombs per acre, at 28s. per coomb, the quantity grown would be 200 coombs, = £280

The rent would be 140

Surplus 140

Take the fixed rent as before, at £125, the surplus would be £155; shewing a difference in favour of fixed rent of £15.

Ex. 3.—Upon the same quantity of land, and corn rent as above, take a deficient crop, six coombs per acre, with a price of 30s. per coomb,

The quantity grown would be 150 coombs, = £225
The rent would be 150

Surplus 75

Take a fixed rent as before, £125, the surplus would be £100; shewing a difference in favour of fixed rent of £25.

Ex. 4.—Upon the same quantity of land, and corn rent as above, take a decidedly bad crop, and a produce of only four coombs per acre, with the price at 80s. per coomb, the quantity grown would be 100 coombs, = £400

The rental would be..... 400

Shewing no surplus; but under a fixed rent as before, of £125, the balance in favour of fixed rent would be £275.

Ex. 5.—Comparative summary of the foregoing calculations:—

In the first case the rent of the farm would require two-fifths of the wheat crop; in the second, one-half; in the third, two-thirds; and in the fourth, the whole. It is only in a year of large produce, therefore, that a pure corn rent would be in favour of the tenant; he fully agreed in the proposition of a new mode of taking the averages.

Many other members took part in this very interesting discussion, and it was remarked, with very general approbation, that it is one which in these times is very essential to both landlord and tenant.

The proposer replied to the various objections and observations on his plan. He still thought that the mode of taking the calculation from the two sorts of grain would obviate any objection to the price of the single year as the basis; and although the present plan might not be a *pure* corn rent, still he believed it to be carried out as far as it was possibly fair work to it, so as to satisfy both parties; and it behoved the club to work out a plan which should be consistent with the *interests* of both parties.

The following resolution was carried unanimously:—

“The club having previously recommended the principle of corn rents, considers the following to be the best plan of carrying them into effect in this district:

“Commute the rent of the farm into equal quantities of wheat and barley, at the prices on which the rent was calculated. The value of these, at the average prices for the past year, viz., from Michaelmas to Michaelmas, at the market where the corn was sold, shall be the rent for that year; but the variation shall be limited to an advance or reduction of 5s. per coomb from the original price. For instance—taking a farm of the same size and value as that on which at our last meeting the calculation of expenses of cultivating land were made, viz.—125 acres, one-fifth pasture, at a rent of 25s. per acre, fixed when wheat is worth 25s. and barley 15s. per coomb, the sum to commute would be £156 5s. say £156 or 78 coombs each of wheat and barley, the value of which at the average prices of each at Harleston market, from Michaelmas 1844 to Michaelmas 1845, would be the rent payable at the latter period. Thus, if the prices of wheat and barley were respectively 24s. and 14s., the rent would be £148 4s., and so on down to 20s. and 10s., when it would be £117; but if the prices were 26s. and 16s., the rent would be £163 16s., and so on up to 30s. and 20s., when it would be £195; but above or below these sums it would not rise or fall, however high or low the price of corn might be.

“The club regrets exceedingly the present im-

perfect system of taking the averages; it is of opinion that the returns should be made by the *growers* only, and that not in a few districts, but throughout the kingdom, and of all the corn sold, excepting for seed. The club conceives there would be no difficulty in carrying out this suggestion, and that many advantages would arise from it, not the least of which would be an exact account of the corn grown and consumed in each year, a statistical document of no slight value.”

The next meeting was held on the 16th of April, when a very full attendance shewed the interest taken in the subject about to be discussed.

Spoooner on the Diseases of Sheep, was ordered for the use of the members.

The member whose name stood for the introduction of the subject on the 21st of May next, stated that he should be prevented by other business from attending on that day, when it was agreed that the Secretary should give notice to the members, that that meeting should be held on the 14th of May, to meet the convenience of the proposer of the question.

The subject for this evening's discussion was then introduced by the Chairman—“The neglect of home-made manures;” who said that as the terms of the notice presumed that neglect did exist with regard to our home-made manures, and such being the too well known fact, it becomes as obviously our duty to rectify it; and the very rapid advance in the application of artificial manures naturally leads to the inquiry whether our own resources are sufficiently carried into effect. He entertained a very strong opinion that we are not justified in the use of artificial manures, if any apparent neglect presents itself in the management of what we already have at our command. With our variety of soil, we have great opportunities of husbanding our manure, which should be made under cover, if possible; and this we must ask our landlords to assist us in, for with our present low prices we must grow more corn, or we cannot go on; our manures as they are now applied to the soil do not raise the crops they ought. With corn-fed cattle their manure is capable of conveying much valuable assistance if properly applied and properly manufactured, if he might so term its preparation. He believed it to be a generally received opinion, that the farms in this locality cannot furnish an ample quantity of home-made manures for twice dressing in a four-course shift, or in other words, a manuring every other year, which, at present prices, is of the utmost importance, as he imagined that, unless this system is fully carried out, compensation to the tenant-farmer in the shape of produce will be looked for in vain.

At the commencement of the season for making manure after harvest, or near Michaelmas, the stock

begins to require shelter; and the first object is, if a fourth of the arable land is in root crop, such as carrots, turnips, or mangel-wurzel, that every available covering should be occupied, as tending so very materially to the advantage of the animal, economising the straw or litter, and securing the rich properties of the manure; indeed, he believed that those who had adopted the system of stall-feeding, would universally agree with him that one load so made under cover in the winter, will produce as much nourishment for production as a load and a half from the open yards. He could but here notice the advantages of stall-fed cattle, their food being entirely consumed without waste; whereas a number of beasts in an open space are frequently disturbing each other, and in leaving one feeding place for another, a piece of turnip or any other food is dropped and wasted; and again, there is a great advantage in each beast being able to fill himself and to lie down as he pleases without the fear even of disturbance. Thus rumination and digestion were kept in a natural state. When the stalls are being emptied, he had adopted the plan of first preparing a bottom, as it is called, of mould from six to nine inches in depth, then carting the manure upon it so as to completely cover it to about the same depth; then another layer of mould, ditch earth, clay, or sand, as deemed most suitable to the soil to which it is to be applied, and so continue until the heap is of sufficient size for the field it may be intended for, great care being taken to cover the top and sides well with earth, to prevent the escape of the gases.

The compost is presumed to be carted over or upon it, in consequence of which it is entirely incapable of heating; therefore the turning or mixing may be proceeded with at pleasure, and of course the crops for which it is to be applied will regulate this operation: great care should be taken in the first turning that every particle of the earthly matter and manure be completely shaken or torn in pieces, and the mixture effectually made, so that the heap may lie in the lightest possible state; a *slight* fermentation is then produced, and the process of decomposition will proceed slowly and safely; the compost is again completely covered as at first, to guard as much as possible against the escape of effluvia; after about a month, another turning becomes necessary, and particular attention should be paid to guard against the too great width of the trenches, or the mixture will not be perfect, as he had found the labourers almost universally, in turning over manure heaps, were too prone to get their trenches very wide, and not unfrequently he had known instances of their forcing or caving a large portion of the top of the loaf to the bottom of the trench without any kind of care, thereby entirely

frustrating the desired object. He deemed it also very essential that in turning, the sides of the heap be put as much as possible into the middle; by this caution any grass or weed which may have been in the earthy portion of the heap will be entirely deprived of vegetative power; but with regard to the seeds of weeds, he would not imagine *their* destruction in heating manure heaps at any time, as by attempting this an incalculable loss would be sustained in burning that which with so much labour and cost had been preparing for the production of crops. After about the same lapse of time, he generally gave a third turning, with the same care and watching as previously noticed. The heap in this last turning will retain merely a milk-warmness, and every particle (if properly managed) will present a rich dark greasy-looking compost, corresponding in appearance to that of an old cucumber bed.

It is now ready to be applied—and the first crop after Michaelmas would be on barley stubbles, as a preparation for beans; and he contended that not less than 25 or 30 loads (here called three-quarter loads) should be applied, as this should in his opinion be the manuring for the wheat crop, and the greater the luxuriance of the bean crop the greater will be the succeeding wheat crop.

If an eighth of the arable land is intended for beans, all the manure made from harvest to Christmas will be required, and would also be all the manure applied to the arable land in the winter months, with the exception of the young layers, which he would presently allude to. From Christmas all the manure up to the middle or latter part of April should be applied for the root crop, which he imagined upon a well-stocked occupation and under good management would provide an ample supply. He must here notice that he presumed all the fallows of the preceding season to have been occupied with the root crop, or the quantity of manure could not be obtained; and also that the fattening stock are well fed with corn or some other forcing food, as without powerful manures remunerating corn crops could not be grown. The summer-made manures should be obtained by stall-feeding cattle, sufficient for producing all that is required for the young layers to be applied the first opportunity after harvest, and the compost, if prepared as before stated, will produce a most convenient and effective dressing. By thus economising our own manures, we should be enabled to grow all that can fairly be expected; and when we can say with honest truth that we have not neglected any home-made manure, and still find the supply to be insufficient, then, and not till then, should we be at all justified in resorting to the expense of artificial manures.

One member also noticed what he could but consider a waste of good manure in the too general plan of spreading for the wheat crop all over the stetch alike. He could but consider the accumulation of soil by gathering the stetch sufficient for the crop, and by spreading the manure upon the top of it, so as to cover about two parts out of three; the sides when it was ploughed in reaped the full benefit of it. Several members objected to so many layers of earth in the manure heap as a useless expense, and it was very generally observed, that where the heap was well compressed by carting upon it, that was sufficient to prevent an undue degree of fermentation. And with regard to the application of raw manure directly to the soil, a scientific member who was present said, in answer to questions put to him as to the comparative merits of raw and mixed manure, "that provided there was a sufficiency of earthy matter well mixed with the manure heap, so as to prevent the escape of ammonia, he would much prefer the mixed to the raw manure. Care should, however, be especially taken not to allow the fermentation to rise previous to turning, for if in a high state of fermentation when turning over, very valuable matter will escape, do it as quick as you will, and no application of any other matter *at that time*, that he knew of, would stop the escape of such matter; but it might be possible to mix something with the manure previous to fermentation which would prevent its escape, or to speak in other words, to 'fix the ammonia.' Gypsum would effect this, and clay, he had no doubt, would answer the same purpose." It was very generally agreed that it was most desirable to get the manure heap into as manageable a state as possible by frequent turnings, but some objected to the too frequent turning as too expensive. The liquid portion of manure received a very great share of the evening's discussion, and the practice of several eminent farmers in the neighbourhood, of having tanks for its reception, was much canvassed. Their plan appeared to be, conveying it in carts for the purpose, to heaps of earth raised from the scourings of ditches, cleaning of banks, or any other available substance, and pouring it upon this heap, when, after some turnings over, it was then a good compost for pasture lands.

The chairman replied to the various objections he had heard urged, and said that with regard to the expense of such frequent turnings, he still could not think that expense given away, when he found his manure in such a good state to mix immediately with the soil; and with regard to tanks for the reception of liquid manure, that expense he thought might be entirely obviated if the plan of covering the yards and sheds with a good coating, earth or sand, sufficient to absorb it, were more

generally acted upon. After some further discussion on this important part of the subject, the following resolution was carried: "It is the opinion of this Club that all manures should be made as much as possible under cover, and should then be carted upon the heap, and well compressed; the bottom to receive it should not be less than a foot thick of earth; and the heap, when made, should be closely covered with earth or mould, to check fermentation, and to prevent the escape of ammonia; in turning over, particular care is required to ensure its being well shaken in pieces and mixed; and with regard to liquid manure, the yards or sheds should be well prepared with a coating of earth sufficient to absorb it; but where the liquid is allowed to accumulate in tanks, it should be applied to the manure heap, or to any earthy matter collected for that purpose, in preference to its being applied immediately to any crop."

The next meeting was held on the 14th of May, 1845, when there was a fair attendance of members. The subject was—"What effects will railroads have on the agriculture of this district?" The proposer of the question said that although the subject might be one of a peculiarly difficult nature to deal with, there were many points in it which he thought it was not difficult to foresee that they would not eventually be beneficial to the country to that extent which many anticipated. Facilities of communication—cheap transit of goods and produce—easy rates of postage, with quick delivery—were all in themselves most desirable objects; but the monopoly once established, would all these benefits be permanent? He very much feared not. There were many objections in connection with their many supposed benefits. Cattle, feeding in a country through which a railroad passed, were found to be so disturbed that their progress was deteriorated very considerably—very much land would be taken up by the different lines, to the detriment of the community in a producing point of view—horses, as beasts of burden, would be lowered in price—rearing would be discouraged, from prices being so lowered—the frequent flush of goods and produce into the markets would have a bad effect on prices; certainly the great facility of supplying them would not tend to raise prices. A general system of railroads would have a tendency to concentrate the population in large towns, for it is but a natural impulse in every class of society; this would have a tendency to divert the traffic from old-established roads, and by this means numerous instances had already occurred of individuals who had been entirely ruined by their best prospects being suddenly snatched away from them by railroad communication. Harleston, like all other small towns, would feel the evil by the

loss of its commercial visitors not staying in it, as the trains would enable them to fly off in other directions without expending anything in it beyond a little time. Even the capital employed in such schemes would be of no benefit to an agricultural community. The coach duties would be a loss to the revenue of the country. In many neighbourhoods we now see around us gentlemen spending their £500 per annum upon their hunting establishments; these would, by such easy facilities of communication, be enabled to leave it for the more desirable or perhaps fashionable counties, and thus a loss would accrue to this neighbourhood. To commercial men, indeed, the saving might be very considerable in time as well as expense; but to the tenant-farmer, who makes but one return in the year, he could not conceive any benefit would arise.

The great majority of the members differed very strongly from the views of the proposer of this subject; it was very appropriately remarked, that in this question there are too great classes to be considered—"producers" and "consumers:" this district is a producing one, and any cheap conveyance for our produce could but be considered as highly beneficial. An instance was noticed of a very superior lot of fat beasts sold in Smithfield Market, lately from Norfolk, and immediately packed off upon the railroad to Bristol; did not this increase the profit to the Norfolk farmer? It is a practical proof of the benefit of cheap transit; it is one of the first of proofs, that without such a speedy conveyance we shall be always too late in this district for good markets; but when we can have a railroad direct to London, and can then send the best of our produce to the best markets, whether corn or cattle, we shall then be upon a fair equality with our neighbours; we shall be brought nearer to the great consuming markets for our produce, which in this county is four times in amount more than its consumption; we shall then have the advantage of the earliest information, and can practically avail ourselves of it as well as those who now have it, and who are now enabled to beat us out of the market by affording a direct supply when prices are remunerating; and with regard to the monopoly which had been alluded to, it was very generally agreed that without very stringent legislative enactments, such would be the case, and to a very fearful extent; but it was as generally believed that the Government would look closely and jealously upon the course which might tend to make the monopoly injurious to the community at large. That part of the subject which alluded to the prices of horses was then entered upon, and the food they consumed. Horse keep is a very expensive item in this country's expenditure. Give that food to any other animal, and it

furnished food for man, which in this kingdom is the great desideratum. Railway communication must eventually be the means of equalising prices all over the country. Keep all the horses in work you please, they never could accomplish this; but with railroad communication we shall be upon about an equal footing with our neighbours; without it, we shall always be behind them. After a somewhat desultory conversation, which lasted some time, it appeared to be the general opinion that no resolution could be arrived at, as to the especial benefit which would accrue to an agricultural district in consequence of the introduction of a railroad, but as we should be entirely shut out of good markets by their introduction in almost all other parts of the kingdom, that such communication and the facilities afforded by it are indispensable here. The following resolution was then carried *nem. con.*:—"It is the opinion of this meeting that railway communication is essential to the agricultural interests of this neighbourhood, in consequence of its introduction in all other directions."

At the next meeting, held on the 8th of October, 1845, the subject was—"Agricultural Machinery, its effects upon our labourers." The member introducing it said, that he looked upon this as a question of the utmost importance, as by the proper use of machinery so much remained to be accomplished. As a general principle he had always advocated its use in agriculture, as he believed it created labour instead of diminishing it. In this county the advantageous application of machinery to manufactures had made itself apparent for very many years, and he hoped yet to see it as advantageously applied to agriculture. He hoped yet to live to see the day when this country would be producing more than we want for our own consumption, by the aid and proper use of machinery in agriculture. With it we can accomplish, in *due season*, almost every desired object; and he honestly believed that by its general use this country might be made to produce one-fourth more than at present. By the judicious use of good machinery, we are enabled to cultivate for the root crop in particular, so as to save much valuable manure; and by growing a good root crop where long fallows would otherwise be had, we are finding food for cattle, which again produce manure; so that here we see the use of machinery producing and reproducing. Again, he had always remarked, on good occupations, where there was the most machinery judiciously applied, there also he invariably found the most labour employed; but it must be here remarked, that this could only be the case where the tenant is secure in his tenure, for the enormous outlay required to purchase and keep up good machinery could

only be justified where the tenant is so secure. The trite old adage came to his mind, which said "the more I hoe the more I grow;" but this hoeing, as an instance, could only be properly accomplished, and at the proper time, by the use of the horse-hoe; and it is not the root crop or any one crop which is alone benefited, but every crop in succession during the course felt the benefit of a thorough stirring *done in proper season*. He believed and affirmed that we do not spend half money enough in stirring and cultivating the soil when the proper time is arrived for it. He had lately had the opportunity of looking around the country for many miles in various directions, and he had listened to almost every variety of information on this subject, which, in fact, all at last resolved itself into this, that where the most judicious application of machinery was found, there also as a natural consequence was sure to be found the most labour employed. He fully believed that the use of machinery in agriculture is one of the best means that can be found for emptying our union houses; for where it is fully and judiciously employed, there labour is created, and as a natural consequence more attention is paid to the cultivation of the soil. He believed also that the moral effect upon the labourer is good, for as it effects the very heavy portion of the labour for him, and he finds that he gets as constant employment with it, he very naturally approves of it; for instance, with the horse-hoe the dead soil is stirred, which lets the hand-hoe in more easily, and the labourer can draw it more lightly to himself; this makes him approve it, for he finds his toil is light and his wages the same. Again, in wet weather by the use of machinery he was very often enabled to find in-door occupation for labourers, who would otherwise be thrown out. This he found always told well with the labourer, and the moral effect still held good. It is a self-evident fact, that all we want now is quantity, and we can only get it by the judicious use of machinery; but we must have manual labour with it. As to machinery extinguishing labour, although he feared there might be instances where it is employed for such a purpose, yet as a whole he was confident it would be found to create instead of extinguish it.

The subject created a very considerable degree of interest with those present. It was remarked that if the use of machinery in agriculture tends to throw men out of work, then it is an evil, and a very serious one. There is a very general impression abroad that such is too often the case, and in some instances when the employer is short of capital it undoubtedly is so, for he naturally says that it will cost me less money to thresh my wheat with the machine than it will by the flail; it is with

him a mere matter of economy, for the labour thus saved is not applied to any other purpose; it is done to save labour, or the expense of it. Had each occupier sufficient means at his command to employ the labour thus saved upon some other work, it would act well. Some differed as to the expediency of applying machinery in order to raise root crops upon particular soils, as it appeared to be the general belief that more was lost by the after corn crops after an ungenial season for removing root crops, than could possibly be gained by them. That increased produce might be raised by the judicious application of it was not doubted, but the farmer must first have the means to purchase it, and in times like the last few years, which have been gradually reducing the farmer's capital, it was not to be expected that the tenant farmer could afford such an outlay. It was remarked with very general approbation, that on very strong lands it would be much more to the tenant's interest, without injury to the landlord, to allow a bean crop to be taken instead of a root crop or a long fallow—this to be compelled to be consumed upon the farm; but this could of course be only arrived at by a change of covenants. It was very pertinently remarked during the evening by a member, that he had heard a great deal about agricultural machinery; but he thought the best machinery would be that applied to the mind and its cultivation, for to that at last we must look for the proper use of any machinery. He was very sorry to perceive such prejudices still existing in the minds of too many against the education of the peasant as well as the mechanic; and he could but think that those who would thus foster ignorance, were much better calculated for a nation where slavery is in the ascendant, than in this free country.

The proposer replied to the many observations and objections which had been raised as to machinery extinguishing labour; as a whole he did not believe such could be the case, but he did unfortunately know instances where machinery had been borrowed of him for the very purpose, which had he known at the time, should never have gone out of his possession. He noticed the growth of a bean instead of a root crop, and he could but bear testimony to the very clean appearance of the land when in barley stubble after them. His maxim was, let the farmer do as he liked with his land during certain years of his lease, and he did not doubt of its being cultivated to his own advantage without injury to the landlord. The following resolution was then carried unanimously:—"That in the opinion of this club the employment of machinery in agriculture, where there is sufficient capital at the occupier's command, is both beneficial and effective as to the employment and moral

condition of the labourer; but where it is employed for the purpose of extinguishing labour, there it is most baneful in every point of view: the great expense of effective implements and perfect machinery can only be borne where the tenant is sufficiently secured by the terms of his tenure."

The next meeting was held at the Swan Inn on the 15th of October, 1845, when there was a full attendance of members. Subject—"The system of employment of the agricultural labourer." The member who introduced the subject referred to the effects of particular times and seasons, during the last few years, upon the employment of the poor in these districts, and the fact that whole parishes of labourers have been thrown out of work at certain seasons by the effects of the weather. He thought it would be granted that the system of employment which had such features as these, had in it something radically bad, something which required the most serious consideration of those most intimately concerned to endeavour to find a remedy for such a crying evil. He noticed the debasing effects which such a state of things must have upon the minds and condition of the poor. He alluded also to the unfair practice of employing the poor man, and taking the full advantage of his labour in fine weather, and when a wet day or two happen to intervene, to make him shift for himself. He noticed also the bad effects which resulted from the practice of having nearly all the work done by out-door labourers. The house servant is under a wholesome restraint, which the mere out-door labourer is not; and where young men are left to spend their evenings as they please, the beer-shop offers such a tempting place of resort that he but too often is its habitual customer, and thus contracts habits which are anything but what they should be. He alluded to the apathy or unwillingness of employment of labour; and he could but ascribe it to the position of the tenant-farmer, as being so generally under a yearly hire; in this position he is likely to be ejected from his farm in any year at six months' notice. Such being the case, he would get repaid what the custom of the country would give him by valuation; and this, it is well known, when the outlay has been what it ought to be, would leave the out-going tenant minus a very heavy sum in unexhausted improvements. He believed the great remedy to be long leases with liberal covenants, and that when such were granted, the landlord ought to demand a security that the poor man will be permanently employed.

Many members objected very strongly to a compulsory employment of any quantity of labour, believing that the lease would be a sufficient stimulus for its proper management. After a

long discussion, the following resolution was carried:—

"That the system of employment of the agricultural labourer, as a system, notwithstanding many exceptions, is very far from what it ought to be, and will always continue so whilst the tenant is insecure under a yearly tenancy. But let the landlord give the tenant that security which a well-regulated lease can alone give, and he will then be able well and permanently to employ the labourer."

A member gave notice, that at the next meeting he would propose "That the rule which prohibits the discussion of political subjects prevents the members of this club from investigating and discussing the question of the corn-laws, as they affect the interests of agriculture and themselves, and that the usefulness of this club is rendered nugatory thereby; and that it is therefore expedient to expunge the 11th rule, and in its place to insert the following—"That all subjects, social, moral, and political, which bear on the interests of agriculture, may be discussed at our meetings."

The annual meeting was held on the 12th of November, 1845.

There was a large attendance of members. The motion which was given notice of at the last meeting, to expunge the 11th rule, was discussed at some length, and carried.

The Chairman was then re-elected, and accepted the office.

The Secretary resigned that office, and withdrew his name as a member of the club as it now existed.

The appointment of his successor was left over to the next meeting.

W. L. B. FREUER, Secretary.

WHEAT. — By a return issued, on the motion of Mr. Childers (Malton), an account is given of the weekly average price of wheat by which the duty is regulated, from the 2d of March, 1844, to February last, as also the total quantities of wheat returned by the inspectors of corn returns from September, 1844, to January, 1845, and from September, 1845, to January, 1846. The first part of the document shows the weekly aggregate averages by which the duty on wheat is regulated by the act 5 and 6 Victoria, c. 14, from March 1844, to the 22d of February last, and also, to the same period, the weekly aggregate averages, calculated according to the provisions of the act 9th George IV, c. 60. The second part has reference to the quantities of wheat returned by the inspectors as brought to market in specified months in 1844-5, and 6. In 1844, in September, the corn returns were 450,526 quarters and six bushels; in October, 540,783 quarters; in November, 626,296 quarters and four bushels; and in December, 554,176 quarters. In 1845, the returns were—January, 518,031 quarters and two bushels; in September, 414,693 quarters; in October, 665,162 quarters and four bushels; in November, 618,167 quarters and six bushels; and in December, 475,617 quarters and two bushels. In January last the return was 503,316 quarters and six bushels.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A Weekly Council was held at the Society's House, in Hanover-square, on the 25th of February; present—Sir Charles Lemon, Bart., M.P., in the chair; Earl Spencer; Viscount Torrington; Hon. Captain Howard, M.P.; Sir John V. B. Johnstone, Bart., M.P.; J. Adams, Esq.; T. Alcock, Esq.; B. Almack, Esq.; G. Raymond Barker, Esq.; S. Bencraft, Esq.; H. Binsted, Esq.; F. Burke, Esq.; H. Burr, Esq.; Dr. Calvert; Rev. Thomas Cator; F. C. Cherry, Esq.; W. Cuthbertson, Esq.; G. Dyer, Esq.; J. Edwards, Esq.; A. E. Fuller, Esq., M.P.; H. Gibbs, Esq.; B. T. B. Gibbs, Esq.; G. Gurney, Esq.; J. H. Hulme, Esq.; J. Kinder, Esq.; A. Majendie, Esq.; W. Miles, Esq., M.P.; E. W. W. Pendarves, Esq., M.P.; Professor Sewell; S. Solly, Esq.; and T. Turner, Esq.

Potatoes.—Mr. Evelyn Denison, M.P., of Ossington, Nottinghamshire, communicated in a letter to Mr. Pusey, M.P., the following results of his experiments in the planting of single Potato-eyes:—

“Ossington, Feb. 23, 1846.

“At this moment of renewed alarm about the Potato crop, and the anticipated difficulty of providing seed for the wants of Ireland, I send you, according to your desire, an account of the experiment tried here last year, of planting single eyes of about the size of a nut, cut out of the whole Potato. Last year, about the middle of March, my gardener was planting early Potatoes, the Ash-leaved Kidney. It occurred to him, as an experiment, to cut out some of the best eyes from a certain number of Potatoes, and to plant these in rows side by side against whole Potatoes. The eyes were cut out with a common knife, and planted at once as they were cut out. The piece was cut out in the shape of a one-inch sided triangle. The sets from these single eyes brought in every case the best crops. From three roots there were one peck of Potatoes. One Potato weighed 1½ lb. The tubers were generally large, weighing towards ¾ lb. each. The plants rose with one single stem from the ground, which was strong and vigorous. They were not so early by a fortnight as those from the whole Potatoes. This may perhaps be accounted for by the circumstance, that in many cases the eyes of the whole Potatoes had made strong shoots when they were planted; but eyes which had not sprouted were chosen for cutting out, as being better suited for the operation. Another experiment of the same kind was tried with second-early Potatoes, called American Natives, with exactly the same results. I have at this moment a crop of early Potatoes under frames, grown from single eyes, which look most promising. The advantages which this plan holds out seem to be these:—1st. In a time of scarcity several eyes may be cut from a single Potato, and almost the whole Potato is still available for food. 2nd. If sets have to be sent from a dis-

tance, as from this country to Ireland, the bulk, and consequently the expense, would be materially diminished. 3rd. By a little timely attention, by inducing parties to cut the crown off each Potato now in the course of daily use, an immense supply of seed might be procured, almost without expense. For the last three months I have had the crown, about the size of a walnut, cut off every sound Potato consumed about this place. I have saved in this way a very large supply of seed for the spring. The eyes in these small pieces, cut off as long ago as three months, look quite fresh and well, and are pushing like those in the whole Potatoes. Here my experience ends: to make the case complete it would be necessary to have proof that the eyes from the crown of a Potato cut some time before planting would answer as well as those fresh cut. Of the apparently certain success which attends planting a single eye fresh cut, I have a very strong corroboration from the practice of the clergyman of a neighbouring village, Mr. Chell, of Kneessall. My gardener has been to Mr. Chell to-day, to obtain the exact particulars. He has been in the habit for 12 years of planting single eyes, making use of the remainder of the Potato for food. He has tried single eyes against whole Potatoes and cut Potatoes, and has always had the best crops from single eyes. He now plants nothing else.”

An interesting paper having been also read from Mr. Southworth, of Merebrow, Tarlton, near Ormskirk, on the same subject, containing the results of his practical experience on several points connected with the cultivation of the potato, especially in reference to the importance of raising potatoes intended for seed from poor soils, instead of rich ones, Sir Charles Lemon referred to the series of experiments carried on at the Horticultural Society's Gardens, by Mr. Knight and Dr. Lindley, to ascertain the best conditions under which the potato plant could be grown. Sir Charles Lemon and Sir John Johnston adduced their testimony respectively to the advantageous practice in Cornwall and Yorkshire of growing seed potatoes in a poorer soil than that in which they were afterwards intended to be cultivated. Mr. Fuller, M.P., Prof. Sewell, Mr. Miles, M.P., the Rev. Mr. Cator, and Dr. Calvert, also favoured the Council with the result of their experience on the subject of the decay or preservation of potatoes in their respective localities, under certain circumstances.

Growth of Plants.—Mr. Pendarves, M.P., introduced Mr. Gurney to the meeting, when that gentleman detailed to the members present the plan of his operations for ascertaining the cause of that remarkable increase of vegetable growth which results from the application of a fibrous covering, such as that of straw or brushwood. The Council requested Mr. Gurney to prepare a written statement in detail on the subject, for the purpose of enabling the members to undertake those practical ex-

periments of his plan which it was the object of his communication to suggest.

Mr. Harrison, of Devizes, transmitted to the Council a paper on the manufacture of draining tiles; Dr. Calvert, a plan of his proposed lecture and exhibition of grasses, at Newcastle-on-Tyne; the Count de Guyon, a letter on the subject of agricultural machinery; the Royal College of Chemistry, a communication connected with the application of chemical science to the requirements of practical agriculture; and the Rev. Thomas Cator, a notice on the question of the height at which wheat can be grown on the Welsh Hills, in comparison with that at which it is now grown in Scotland.

The Council then adjourned to Wednesday, the 4th of March.

A Monthly Council was held at the Society's House, in Hanover-square, on Wednesday, the 4th of March; present, The Right Hon. Lord Portman, President, in the chair; Sir Charles Lemon, Bart., M.P.; Sir John V. P. Johnstone, Bart., M.P.; Col. Austen, M.P.; S. Bennett, Esq.; W. R. Browne, Esq.; Col. Challoner; F. C. Cherry, Esq.; J. W. Childers, Esq. M.P.; H. Gibbs, Esq.; S. Grantham, Esq.; W. Fisher Hobbs, Esq.; John Kinder, Esq.; P. Pusey, Esq. M.P.; F. Pym, Esq.; Prof. Sewell; J. V. Shelley, Esq.; R. A. Slaney, Esq.; W. Cuthbertson, Esq.; A. E. Fuller, Esq., M.P.; Joseph Johnson, Esq.; James Marmont, Esq.; S. Solly, Esq.; E. Tattersall, Esq.; and T. Turner, Esq.

Finances.—Colonel Austen, M.P., Chairman of the Finance Committee, presented to the Council the monthly report of the state of the funds of the Society: from which it appeared, that stock to the amount of 1,200*l.* having been sold out of the 3¼ per cents. to meet the inconvenience occasioned by the excess of payments over receipts on account of the Shrewsbury Meeting, the invested capital was reduced accordingly to 7,000*l.* stock, with a current cash-balance in the banker's hands of 1,589*l.* The Council unanimously adopted this report, and ordered that a letter should be addressed by the Chairman of the Committee to each member of the Society in arrear of his subscription, reminding him of the circumstance, and requesting a remittance of the amount by means of a post-office order made payable to the secretary.

Prize Essays.—Mr. Pusey, M.P., Chairman of the Journal Committee, reported that 105 essays had been already received in competition for the prizes offered by the society; independently of those essays which are required to be sent in at a later period of the year; namely, those on the potato disease, by the 1st of June; those on the St. John's day rye, by the 1st of October; and those on peat charcoal, as a manure, by the 1st of December next.

Agricultural Chemistry.—Mr. Pusey, M.P., as Chairman of the Committee on the Analysis of the Ashes of Plants, then laid before the Council the following report of the committee on that subject:

Report.—“The Committee on the Analysis of the

Ashes of Plants beg to report, that Professor Graham, to whom the design had been referred, waived the undertaking in behalf of Dr. Lyon Playfair, the consulting chemist of the society, on that gentleman's appointment as chemist to the Museum of Economic Geology, to which office a laboratory in London is attached. That Dr. Lyon Playfair, however, having been placed on several commissions under the crown, has not had time at his disposal for carrying out the Society's views. That this delay has served greatly to strengthen the original grounds of the undertaking, since the hope then entertained, that after ascertaining those earthy materials of crops which are found in their ashes, we might employ the same chemical substances as artificial manures, has now been carried partially, and is likely to be carried more generally, into practice. That it is necessary, however, to obtain new analyses of these ashes, because differences are found in the results of former inquiries, which it is desirable to clear up, and to ascertain whether these differences have arisen from errors of the experimentalist, or from variations in soil, manure, or other causes affecting the produce itself, and consequently its mineral ingredients. That in order to secure the utmost attainable accuracy, Professor Liebig, who suggested this undertaking, should now be consulted as to the methods by which it should be carried into effect, and requested to communicate his views to the Council. That the Committee recommend the partition of the analyses; and that application should in the first instance be made to those institutions which have already recognised agricultural chemistry as a distinct object of their researches. They therefore recommend that as the College of Chemistry has appointed a Committee on Agricultural Chemistry, enquiry should be made on what terms a share of the analysis would be undertaken by that Society; and that a similar enquiry should be made of the Agricultural College at Cirencester. They recommend that the names of several members eminent for their chemical acquirements should be added to the Committee.”

This Report having been unanimously adopted, and agreeably with its recommendations the names of Professor Liebig, Dr. Lyon Playfair, Dr. Daubeny, Professor Solly, and the Rev. A. Huxtable, added to the list of the Committee; the following gentlemen were, on the motion of Mr. Pusey, M.P., elected Honorary Members of the Society, and also added subsequently to the Committee, namely, Professor Graham, Dr. Fownes, Dr. Wade, and Dr. Hofmann.

A letter was then read from Dr. Gardner, Secretary to the Royal College of Chemistry, communicating a suggestion from the Council of that body to the Council of the Royal Agricultural Society of England, that a Committee of the Society should be appointed to confer with a Committee of the College, for the purpose of ascertaining the mode in which the prosecution of chemical inquiries, for agricultural purposes, as an object of common interest to both institutions, can be most efficiently carried out. The Council resolved that this suggestion should be referred to the Committee of Analysis, which should be authorised to communicate

with the Committee of the Royal College of Chemistry on the subject.

The Rev. A. Huxtable communicated, through Mr. Pusey, a letter substantiating the accuracy of his estimate of the expense of growing Turnips on barren land, chiefly with chemical articles; the original pecking of the land having cost, not 6d., but 3d. only per rod.

Country Meetings.—Mr. Shelley having reported to the Council the various results of the consideration of the General Newcastle Committee in reference to the arrangements for the ensuing country meeting of the Society, at that town, in the middle of July next, the Council decided generally on the following points:—

1. That there shall be no Council Dinner this year.
2. That a lecture on some subject of practical interest shall be delivered at Newcastle-on-Tyne, at 5 o'clock on the afternoon of Wednesday the 15th of July.
3. That the award of prizes by the judges shall be read at 8 o'clock on the same evening.
4. That the lecture-room shall be open to all members of the Society, on their being furnished with free tickets to be obtained at that period of the secretary.
5. That all details on these points be left to the arrangement of the General Newcastle Committee.

The Council then took into consideration the various offers made to the Society on the subject of the lecture to be delivered before the members at their ensuing country meeting.

On the motion of Mr. Humphrey Gibbs, the following appointments for the meeting were confirmed, viz.—

Director of the Show.—Mr. Brandreth Gibbs.

Stewards of the Cattle Department.—Earl Spencer, Mr. Druce, Mr. Kinder.

Stewards of the Implement Department.—Mr. Miles, M.P.; Mr. Shelley.

The Council having ordered that it be referred to the Rotation of Districts' Committee, to take into consideration the expediency of holding the country meeting of the Society for 1847 in the South Wales district, Mr. Pusey gave notice that he should bring that question before the Council at its next monthly meeting.

FLAX.—Mr. Pusey stated that it was the intention of the Journal Committee, to take into consideration whether it would not be desirable for the Society to offer a good prize on the subject of Flax cultivation.

The following communications were then made to the Council:—

1. A statement by the President, of the uniform success which to the present time had attended his experiments in growing Potatoes, apparently sound and healthy, from the most diseased seed in which a sound eye had been left; and of his intention to submit the results of his numerous experiments on this subject to the Council as soon as plants were sufficiently advanced in growth for the purpose. The sound eye in these cases was not extracted, but the whole of the seed Potato, sound and unsound, planted together in one mass.
2. A statement from Sir Charles Lemon, of the pro-

bable latent existence of the disease in the Potato previously to the last season, and of its actual existence in given specimens, without being discoverable to the eye by means of the most powerful microscope.

3. Communications on the same subject from Mr. Fuller, M.P., and Mr. Browne.
4. A letter from Mr. Kimberley, on the cultivation of the *Convolvulus Batatas*, or "Sweet Potato," as a substitute for the ordinary Potato; and on the circumstances under which the Spanish Phosphorite could be obtained from the Continent.
5. A letter from Mr. Moyle, of Western Canada, on the subject of Gypsum as a manure.
6. Results from Mr. Rodwell, of his cultivation of the Italian Rye Grass, with specimens of the brown and pale varieties.
7. The new volume of "Coates's Herd Book" from the Editor, Mr. Strafford, of 4, Morton Villas, Camden-Town.
8. Mr. Johnson's prices of Draining Tiles; Mr. Bate on Agricultural Schools and Farms; Mr. Couch on destruction of Insects; Mr. Nichols, Papers on Flax Cultivation; and Mr. Ewing on Potato Consumption.

The Council then adjourned to Wednesday, the 11th of March.

A weekly council was held at the Society's house, in Hanover-square, on Wednesday, the 11th of March; present, Thomas Raymond Barker, Esq., in the chair; Sir R. Price, Bart., M.P.; F. Burke, Esq.; F. C. Cherry, Esq.; B. Gibbs, Esq.; Professor Sewell; W. R. C. Stansfield, Esq., M.P.; C. H. Turner, Esq.; G. Wilbraham, Esq., M.P.; H. Wilson, Esq.; B. Almack, Esq.; G. R. Barker, Esq.; T. B. Browne, Esq.; H. Burr, Esq.; Dr. Calvert; W. Cuthbertson, Esq.; A. E. Fuller, Esq., M.P.; J. A. Knipe, Esq.; A. Majendie, Esq.; A. Ogilvie, Esq.; E. Parkyns, Esq.; H. Price, Esq.; T. Turner, Esq.; T. R. Tweed, Esq.; and J. L. Wight, Esq.

The following communications were received:—

1. From Professor Sewell, on the part of extensive cattle salesmen, in the metropolis, complaining of the serious injuries to which stock were exposed in their conveyance by railway, in consequence of the improper treatment to which they were subjected, and the want of proper arrangements for their stowage and transit; and the great loss sustained on that account by their owners. The extent to which such injuries were inflicted was corroborated by Mr. Cherry and Dr. Calvert; Mr. Cherry suggesting that the animals should be placed in divided compartments, and that spring-puffers should be placed between the trucks.
2. From Mr. Owen, of Westerfield, near Ipswich, on the use of Sea-water as Manure.
3. From Mr. Elly, of New Ross, Ireland, on an experiment in progress on the Feeding of Sheep with Furze.
4. From Mr. Neile, of Belle-ville, county of Wicklow,

- a present of Potato seeds, carefully collected from healthy plants of 1845.
5. From Mr. Rogers and Mr. Brown, communications on the subject of the Potato disease.
 6. From Mr. Douglas, on the Removal of Diseases of Cattle arising from their Teething.

The Council then adjourned to Wednesday, the 18th inst.

A Weekly Council was held at the Society's house in Hanover-square, on Wednesday, the 18th of March: present, Thos. Raymond Barker, Esq., in the chair; Sir John V. B. Johnstone, Bart., M.P.; F. Burke, Esq.; F. C. Cherry, Esq.; J. W. Childers, Esq., M.P.; H. Gibbs, Esq.; W. G. Hayter, Esq., M.P.; W. Fisher Hobbs, Esq.; Geo. Kimberley Esq.; John Kinder, Esq.; Prof. Sewell; W. Shaw, Esq.; R. A. Slaney, Esq.; W. R. C. Stansfield, Esq., M.P.; J. H. Aylmer, Esq.; H. Baillièrè, Esq.; S. Bencraft, Esq.; Rev. J. Bonham; Dr. Calvert; W. Cuthbertson, Esq.; A. E. Fuller, Esq., M.P.; J. Greene, Esq.; W. Leveson Gower, Esq.; A. Majendie, Esq.; A. Ogilvie, Esq.; E. Parkyns, Esq.; H. Price, Esq.; Capt. Rushout; Rev. T. P. Slapp; S. Solly, Esq.; J. Swinburne, Esq.; T. Turner, Esq.; and T. R. Tweed, Esq.

Prize Essays.—Mr. Pusey, M.P., Chairman of the Journal Committee, communicated to the Council the mottoes of four essays, which the Judges had declared to be the winners of the Society's Prize in each of the respective classes in which they competed; and the sealed motto papers containing the authors' names being delivered to the Chairman, and opened in the presence of the Council, the adjudications were found to stand as follows:—

- I. To George Nicholls, Esq., of 17, Hyde Park-street, London: the prize of 30*l.*, or a piece of Plate of that value, for the best Essay on the improvement of the Condition of the Agricultural Labourer, so far as it may be promoted by private exertion, without legislative enactment.
- II. To W. C. Spooner, Esq., Veterinary Surgeon, of Southampton: the Prize of 10*l.*, or a piece of Plate of that value, for the best account of the use of Super-phosphate of Lime as a manure.
- III. To Thomas Cooke Burroughes, Esq., of Gazeley, near Newmarket: the Prize of 10*l.*, or a piece of Plate of that value, for the best account of the Cultivation of White Mustard.
- IV. To Thomas Rowlandson, Esq., of 59, St. Ann-street, Liverpool: the Prize of 50*l.*, or a piece of Plate of that value, for the best report on the Farming of North Wales.

Miscellaneous Communications.—1. A letter from Lord Portman, the President of the Society, informing the Council, that the potatoes raised by his lordship from diseased tubers, in dry heat, and in pots well drained, had been examined by Dr. Lindley, and pronounced to be quite sound.

2. A letter from Mr. Moyie, of Western Canada, addressed to Lord Portman, on circumstances connected

with the prevalence of the potato disease, and the presumption that the malady has had its origin in the presence of an excess of acid matter generated under peculiar conditions in the potato, especially in the coloured varieties.

3. A statement from Mr. Thomas Wilmot, of Coundon, near Coventry, on the raising of potatoes from seeds, in this country and in Australia; with specimens of the result of his cultivation, and an offer to send a supply of such potatoes for any experiments the Council might direct to be made with them.

4. A report from Mr. Cherry (veterinary surgeon to the army) of the directions given by Marshall in his "Rural Economy of Yorkshire" (vol. 2, p. 51), published in the year 1788, for raising potatoes from seeds.

5. A communication from Mr. Greene, of Greenville, Co. Kilkenny, of the directions for saving the potato-apple for seed, issued at Berlin by the Prussian Minister of the Interior.

6. A letter addressed to Mr. Fuller, M.P., by the Rev. James Williams, of Llanfairynghornwy, in Anglesey, on the result of his potato crop; on his long experience that single potato-sets, if they grow, give a far better crop than whole potatoes; and on the fact that 40 years ago, Capt. Jones introduced to his notice a scoop sent him from London with which the eyes were taken out singly, leaving the great bulk of the potato for use.

7. A statement from Mr. T. R. Tweed, of the success which had attended the trials he recommended to the occupiers of the allotments at Woolwich, of planting the peeling of the Potato in which the part near one of the eyes was cut deeper than the rest.

8. Remarks on the Potato disease, from Mr. John Hull, of Tarleton, near Ormskirk.

9. A suggestion from Mr. Williams, of Glamorgan-shire, that some economical mode should be devised for applying the decayed Potatoes, when dried, to the feeding of cattle, instead of allowing them to be thrown away entirely to waste.

10. Mr. Curtis presented a French work, on the part of M. Guérin-Méneville, the author, relating to the insects observed to the present time in diseased Potatoes, and containing engraved illustrations of their character and structure.

11. A notice from Sir John Johnstone, Bart., M.P., that he had been requested by a friend to obtain for M. Ouvrard, the distinguished French financier, at present in this country, leave to submit to the Council his statement of a new mode of managing farm-yard manure. The Council accordingly appointed such statement to be laid before them at the ensuing weekly meeting.

12. A letter on draining, from Mr. Harrison, of Devizes.

The Council then adjourned to Wednesday, the 25th inst.

NEW MEMBERS.

Atkinson, John, Newbiggin, Hexham, Northumberland
 Barber, Thomas, Hobland-hall, Great Yarmouth, Norfolk
 Bolan, Christopher, Low Trewitt, Rothbury, Northumberland

Bolan, William, Newcastle-on-Tyne
 Clayton, John, Chesters, Hexham, Northumberland
 Cookson, John, Benwell House, Newcastle-on-Tyne
 Commerell, William Augustus, Strood, Horsham, Sussex
 Cresswell, Oswyn Baker, Cresswell, Morpeth, Northumberland
 Curteis, George, Canterbury
 Dawson, William Edward, Plumstead Common, Kent
 Duncan, William George, Great Houghton House; Northamptonshire
 Edwards, William, Brook House, Ross, Herefordshire
 Fitz-Patrick, Richard Nelson, Graunstown Manor, Queen's County, Ireland
 Green, William George, Bedford Villa, Bedford, Northumberland
 Hall, Henry, Neasdon, Willesden, Middlesex
 Hamborough, Albert, Steep Hill Castle, Newport, Isle of Wight
 Hawdon, Robert, Morpeth, Northumberland
 Hereford, Viscount, Tregoyd, Hay, Herefordshire
 Hinde, John Hodgson, M.P., Acton House, Felton, Northumberland
 Jackson, William Kay, Barbot Hall, Rotherham, Yorkshire
 Lawson, Edward, Redesdale-cottage, Newcastle-on-Tyne
 Levi, William, Newport-Pagnel, Bucks
 Littlewood, William, Bramley Moor Farm, Chesterfield, Derbyshire
 Longridge, William Smith, Bedlington Iron Works, Northumberland
 Lowe, Henry Porter, Calverton, Nottingham
 Markby, John, Duxford, Cambridge
 Merrifield, Thomas Seare, Wainfleet, Lincolnshire
 Nelson, William, Olive-house, Alnwick, Northumberland
 Ogden, William Bernard, Newcastle-on-Tyne
 Ogle, Charles, Newcastle-on-Tyne
 Parkyns, Thomas, Ruddington, Nottinghamshire
 Peel, Jonathan, Accrington-house, Blackburn, Lancashire
 Redman, John, Froxfield, Marlborough, Wilts
 Roebuck, J. A., Milton, Christchurch, Hampshire
 Sankey, Richard, Nant, Holywell, Flintshire
 Searth, James, Newcastle-on-Tyne
 Smedley, Charles E. B., Edinmouth, Kelso, Roxburghshire
 Smith, John, Goswick, Berwick-on-Tweed
 Thurlow, Rev. Thomas, Baynard's-park, Guildford, Surrey
 Wheatley, Matthew, Shieldfield, Newcastle-on-Tyne
 White, John Brown, Little Bedwyn, Marlborough, Wilts
 Widdington, Captain, R.N., Newton Hall, Northumberland.

REVIEW.

COATES'S HERD BOOK; A New Edition, revised
 by H. STRAFFORD.

We could perhaps find no better example of the increasing intelligence, and thorough good understanding amongst all concerned in the pursuit of agriculture, than in the support so generally awarded to Coates's Herd Book—a support, be it understood, that in this case implies approval of a far more decided character than the mere act of purchasing a single volume, or becoming a regular subscriber. In the common acceptation of the term, this, no doubt, would be considered amply sufficient; while, on the other hand, for a work of such a

nature as the Herd Book, the communication between its proprietors and its patrons *must* be infinitely more direct and definite, to afford either encouragement to the one or satisfaction to the other. "The authority in fact of a work," as the new editor, Mr. Strafford, truly remarks in his preface, "which gathers its contents from such a variety of sources and districts, depends very greatly on those who consult it: from such should we be indebted for the correction of error and the conveyance of information." It is, indeed, we might go on to say, the very key-stone to its success; the main duty required of its compiler being a thorough knowledge of the material he receives, and a certain skill or tact in making use of it.

On these considerations we should unhesitatingly have named Mr. Strafford as able a successor to the Messrs. Coates as it would have been possible to have elected; an opinion founded on facts which few breeders or admirers of short-horn cattle will need to be more fully entered upon here. His standing as an animal painter—his consequently almost invariable attendance at the principal prize cattle shows—his long study of the subject, and his intimate acquaintance with the majority of breeders, must, we judged, have given him qualifications for the office, in no degree unworthy of ranking with those of his predecessors. And in this estimate, it need scarcely be added, we have not been disappointed; the revise of the three first volumes of the original edition here collected into one, is such as to guarantee at least a usual amount of care and ability in continuing it. Every improvement that time or other causes made the volume susceptible of, has been readily and cleverly worked up with it; while in the matter of embellishment, printing, &c., &c., a liberality and a taste has been exercised, never previously aimed at or attained. For the illustrations, Mr. Strafford himself is of course more especially answerable, as, to Mr. Rogerson, of Norfolk-street, must we allow the credit for the general "getting up." The Herd Book, in short, has in every way fallen into hands able and willing to do full justice to it and the interest it so materially tends to assist.

Two more volumes in continuation are we see announced as nearly ready, and we are glad to find from a notice in the volume before us, that these said continuations will, for the future, be issued at much shorter intervals than has hitherto been deemed advisable. This is an advance we trust breeders will not be slow to appreciate, particularly as we believe it is an alteration and an *improvement* that has altogether emanated from the most zealous of the subscribers.

PRICE OF POTATOES IN IRELAND.

By order of the House of Commons, a return has been issued "of the highest price of potatoes in the various markets in Ireland, per bushel and stone, in the week ending the 24th day of January, for the last seven years (from 1840 to 1846 inclusively), as well as they can be ascertained." From the printed copy of this return we subjoin a few random gleanings:—

Highest price, per stone, week ending Jan. 24.		Highest price per stone, week ending Jan. 21.	
1840.	1846.	1840.	1846.
d.	d.	d.	d.
ANTRIM.			
Antrim	3	5	
Ballymoney	2½	5	
Belfast	3½	6½	
Cushendall	2½	4½	
Lisburn	2¾	6	
ARMAGH.			
Crossmaglen	2	5½	
Keady	2½	6	
Tanderagee	2½	5	
CARLOW.			
Tullow	2	4	
CAVAN.			
Bailieborough	2¾	4	
Ballybaise	2½	3¾	
Cootehill	1½	4½	
Stradone	1½	4	
CLARE.			
Ballyvaughan	2	3	
Kilrush	2	3½	
Miltown Malbo	1½	3½	
Scariff	2½	3½	
Talla	2¾	3½	
CORK.			
Ballincolig	2½	5½	
Middleton	4	6	
Newmarket	3	3½	
Rathcormac	2½	4	
DONEGAL.			
Ardara	1½	3	
Creeslagh	2	3½	
Dungloe	1½	3	
Glenties	1½	3½	
Moville	2	4½	
Raphoe	2	3	
DOWN.			
Banbridge	3	5	
Donaghadee	2½	4	
Kireubbin	2½	4	
Portaferry	3	4	
Saintfield	3	5½	
DUBLIN.			
Balbriggan	4	6	
Ballylough	5	6½	
Clontarf	4½	6	
Howth	3½	6½	
Skerries	3½	6	
Tallaght	4	6	
FERRANAGH.			
Edenderry	2½	3	
Kesh	2½	3	
Maguire's-bridge	2½	4	
Newton-butler	2½	4	
GALWAY.			
Alaserah	3	4	
Ballinasloe	3½	4½	
Portumna	3	4	
Galway	3	4½	
Tuan	2½	4½	
Williamstown	2½	4½	
KERRY.			
Dingle	2	4	
Listowel	2	4	
Miltown	2	3½	
Tralee	3	4½	
KILDARE.			
Athy	3½	4½	
Kilcock	3	4½	
Naas	3	4½	
Robertstown	3½	4½	
KILKENNY.			
Callan	2½	3½	
Castlecomer	1½	4½	
Graigie	3	3½	
Kilkenny	3½	4½	

In a note appended to the official catalogue the inspector-general remarks, "It is represented, &c. that the present low prices in some instances are attributable to the anxiety of the farmers to dispose of their potatoes before they become diseased; others refer low prices to disease already commenced." In either case the ultimate as well as the present effect must be most injurious. If immediate and active measures be not employed, we dread to reflect upon the futurity in store for Ireland.—Journal of Commerce.

MALT AND MALT DUTY.

The following are the results shown by a return issued by order of the House of Lords, giving an account of Malt charged with duty from the year 1841 to 1845, and of the amount of duty received thereon in the United Kingdom:—

Years.	Bushels.	Duty.
1821	29,393,441	£5,297,389
1822	29,848,080	4,082,886
1823	28,164,137	3,619,498
1824	32,511,743	4,172,452
1825	36,205,450	4,631,324
1826	32,468,778	4,177,276
1827	29,613,501	3,809,997
1828	36,794,206	4,731,582
1829	29,153,177	3,743,613
1830	32,962,454	4,231,996
1831	39,252,269	5,036,666
1832	37,390,455	4,799,051
1833	40,075,895	5,140,757
1834	41,145,596	5,275,603
1835	42,892,054	5,499,882
1836	44,387,719	5,699,878
1837	40,551,149	5,216,966
1838	40,505,566	5,211,798
1839	39,930,941	5,139,804
1840	42,456,862	5,592,476
1841	36,164,448	4,889,251
1842	35,851,394	4,848,583
1843	35,693,890	4,827,950
1844	37,187,186	5,027,061
1845	36,545,990	4,937,958

Excise Office, London, Feb. 21, 1846.

HOPS, MALT, BREWERS.—Accounts relating to hops and malt, and of the number of persons licensed as brewers, victuallers, &c.—From this return it appears that in the year 1845, there were in the United Kingdom 48,058 1-16 acres of land devoted to the cultivation of hops, on which the duty amounted to 288,526l. 0s. 7½d. Quantity of British hops exported to foreign countries, 151,210lbs. Foreign ditto exported, 728 cwt. 0 qr. 26lbs. Imported, 726 cwt. 0 qr. 18lb. Malt made between Oct. 10th. 1844, and Oct. 10th, 1845, 3,749,124 qrs. Between the same dates there were in the United Kingdom, 2,637 brewers, of which 2,324 were resident in England, 198 in Scotland, and 115 in Ireland. There were 87,375 victuallers, of which 58,055 carried on business in England, 45,846 in Scotland, and 13,474 in Ireland. In England there were 32,553 persons licensed to sell beer to be drunk on the premises, and 3,769 to sell beer not to be drunk on the premises. The brewers consumed in the year 18,972,913 bushels of malt; the victuallers, 7,715,608; and the retailers of beer, 3,304,475.

WEST OF ENGLAND AND SOUTH WALES LAND DRAINING COMPANY.

The first general half-yearly meeting of this company was held, at the office in Bedford Circus; Sir John Kennaway, Bart., of Escott, in the chair. There were present Sir Thomas Tancred, Bart., of Stratton House, Cirencester, Thomas Porter, Esq., of Hembury Fort, Clifford Shirreff, Esq., of Colyton, Captain Trevillian, T. A. Mansford, Esq., of Bath, E. G. Roberts, Esq., Wm. Lee, Esq., G. C. Holroyd, Esq., S. T. Kekewich, Esq., of Peamore, and Messrs. T. Hussey, Wm. Wippell, T. Venn, &c., besides the consulting engineer of the company, Mr. Parkes, Mr. Thos. May, the secretary, Mr. J. G. Bidwill, the master of the works, and Mr. Geo. Pye, the auditor.

The SECRETARY read the report of the directors as follows:—

DIRECTORS' REPORT.

"In presenting their first general report to the shareholders of the West of England and South Wales Land Draining Company, the directors feel it to be their duty to give a brief review of the proceedings of the company, since its formation in October, 1844. The novelty of the undertaking, the importance attached to the objects of the company, its present position, with the result of its operations, all require this at the hands of the directors. It will be found that they had to commence this undertaking at a time when the state of the money market caused unexpected difficulties in beginning operations on the scale at first anticipated, which finally led to its commencement on a reduced plan. While, therefore, they congratulate the shareholders on the present prospects of the company, they are desirous of giving the fullest information as to the means by which they have been secured.

"The objects for which the company was formed are well known to the shareholders. Its main feature was declared in the original prospectus to be 'to afford to landowners and occupiers increased facilities for the draining of their land by executing the necessary operations with the most suitable materials in such manner as shall be deemed the most scientific, economical, and effectual, or by the advance of capital for such purpose—the cost incurred thereby, or the money advanced, to be paid by instalments.'

"The prospectus of the company was issued in October 1844, and on the sum of £10,000 being subscribed, it was considered by the provisional committee, under the discretionary power given them in this respect, and by the recommendation of their engineer, Mr. Parkes, to be a sufficient capital to enable them to commence the undertaking, and they were further induced at once to erect a tiler, sheds, &c., at Farringdon, about four miles from Exeter, on the application of several landed proprietors in that neighbourhood to drain their lands, and the promises of many others to apply hereafter to this company for scientific draining. The works now in operation, together with the orders for draining lately received by the company, have led your directors to prepare for such extended operations, by directing the erection of tileries in other localities from whence applications have been received in extent sufficient to warrant the outlay.

"That such calls for the exertions of the company will constantly increase and extend, your directors confidently

anticipate. By availing themselves of the experience and skill of the professional gentlemen and practised workmen in the service of the company, landlords are saved from the useless outlay often incurred through ignorance of the best methods of draining, or through the prevalence of local prejudices; the work is executed in the most permanent and effectual manner, whilst land agents and tenants are saved the trouble of contracting with labourers for or superintending work to which they may be unaccustomed, and the best methods of executing which may be unknown to them.

"The subjoined joint report of the secretary and manager of the works will show the successful operations of the company and its future prospects. The report of the auditor, also annexed, will shew the pecuniary results, establishing the fact that a remunerating profit will be obtained in proportion to the quantity of land which may come under the operations of the company, and also enabling your directors to recommend that out of the ascertained profits from the work done, interest at the rate of £4 per cent. per annum shall be payable for the half-year ending 24th June next, upon the capital subscribed and paid up on or before the 25th March next, the surplus profit after the payment of such interest being reserved for a future dividend.

"In conclusion, your directors beg to express their obligations to many scientific and practical men for the full and free information given by them on the subject of land draining, and to add a hope that the advantages derivable through the means of so useful a company may not only be appreciated, but largely enjoyed by the very numerous body of agriculturists who labour under the heavy disadvantages attending the cultivation of soils surcharged with water."

He then read the joint report of the Secretary and Manager of the works:—

REPORT OF THE SECRETARY AND MANAGER OF THE WORKS.

"In this the first half-yearly general report, your secretary and manager of the works beg conjointly to state the results of the operations of the company, and to direct the attention of the committee to the fact that the operations of draining lands have, from circumstances fully known to your committee, been so circumscribed as only to embrace the period since October last, and therefore not exceeding in duration four entire months.

"It is with no little feeling of pleasure that your officers are enabled to state that the erection of tileries, sheds, and buildings on your property at Farringdon has been carried to a state of working operation under the superintendance and approval of your engineer Mr. Parkes, and that the clay has proved in every respect suitable for producing pipe tiles of a quality both excellent and durable; but the manufacture has not been in quantity equal even at this early period to the requirements of the company, a circumstance to which every attention has been given with a view to a large increase of production in the ensuing year, as even a limited experience has shewn that in the event of an over-production for its own uses in draining, there would exist a profitable mode of investment of the company's capital in the sale of pipe tiles alone.

"Your officers beg to refer you to the report of the auditor for his explanation of the pecuniary position of the company,

as well as the results of its operations in carrying out practically the original intentions of the company, developed as they are at this early period; and by which it will be seen that the anticipated results have been realized in proportion commensurate with the amount of business done.

"In reporting upon the future prospects of the company your officers with pleasure refer to the annexed schedule containing applications from landowners who have expressed a desire to have their lands drained through the medium of the company; and daily experience leads them to anticipate that the applications will rapidly be increased both in number and amount, as the hitherto successful operations of the company become more generally known; and in order to show that the draining as yet done by the company has given satisfaction, your officers with pride refer the committee to the accompanying letters received from tenant farmers, on whose farms contracts for draining have been in part completed.

"Your officers beg leave respectively to state their conviction that the company are now placed in a truly safe position, and capable of being carried to an almost indefinite extent, supported, as they trust it will continue to be, by landed proprietors and occupiers, and conducted with the energy requisite to insure success."

The SECRETARY reported that applications had been received from fifteen influential landowners for the survey of their estates by the company's engineer, and that such surveys have led to orders for the company to drain estates containing upwards of one thousand acres.

It was also reported that promises had been received from upwards of thirty landowners to employ this company to drain estates containing in the aggregate many thousand acres.

Letters were also read from several farmers and land-agents testifying to the effectiveness of the system. Mr. Philip Walters, of Honiton's Clist, wrote to say that, as a practical farmer, he was convinced of the excellence of the system, which had worked on his lands astonishing improvement.

Mr. Henry Paramore, of Petherton Park, stated that he had found the system "completely and immediately effectual." In two fields, one thirty and the other twenty acres, set out to be drained, it had been thought six acres of each would be sufficient, but the remainder was found so wet that it was found necessary to drain the whole. In one part of the twenty-acre field, drains laid in three roods fifteen perches of land discharged three gallons of water per minute. Another field, if it had not been thoroughly drained, could not have been sown with wheat the last wet season; and now (7th February) the plant looks more thriving than in an adjoining field, which had not been drained, although it was of a better quality, and the wheat had been drilled in a month earlier.

Mr. R. Carter, of North Petherton, states that the company have placed drains four feet deep in his field, a heavy loam with a retentive clay sub-soil, and occasionally a stratum of gravel interposed; and the water had been flowing from them without intermission.

Mr. J. Gatcombe, of the same place, states that he has two fields adjoining one another, of a similar quality; the one being two years old grass, doubly manured, but not drained, which was drilled into wheat in the latter end of November; the other drilled by the company, and

drilled with wheat after potatoes, *more than a month later*. Both had been so wet that he had not expected to crop till late in the spring; but, on the 7th of February, the drained land was more forward, and infinitely superior to the other.

Messrs. John Drew and Son, of Peamore, say, "We are thoroughly convinced of the good effect of the deep pipe tile draining, as practised by the company." The effect on a few acres of grass land belonging to the Earl of Devon, at Alphington, in a very short time far exceeds their expectation; and the method of doing the work, and the tools are very superior to the old system.

Sir THOMAS TANCRED moved the adoption of these reports. He congratulated the company on its prospects, and hoped the next meeting would be larger. The company was yet in its infancy, both in the extent of its work and the benefits it conferred on the public, and on its own members; but he trusted it would soon grow into a perfect stature. He regarded this undertaking with interest, not merely as a pecuniary investment, but as a most important agent in the improvement of agriculture. The time was now come when the agricultural body must avail itself of those powers of combined capital, intellect, and practical skill, which had worked such vast results in manufacturing and railway enterprise. Landlords attempting individually to improve large estates could often not cope with the complicated difficulties—they were embarrassed for want of capital, or they had not knowledge of all the operations. It is as if the Great Western proprietors should make their line, each working with his own hand. The present position of agriculture is that of hand-loom weaving before Arkwright, and when combined capital and skill can be applied to cultivation, it may advance in the same degree. The separated efforts of isolated individuals are altogether powerless; but by such a company as this they may improve successfully. He took this opportunity of saying that he was connected with an institution at Cirencester, which had for its object the improvement of agriculture—the Royal Agricultural College, chartered by the Crown, and patronised by Prince Albert. On Easter Monday it would be opened for 100 pupils; a gentleman of first-rate scientific acquirements, the Rev. Mr. Hodgkisson, from Cambridge, had been engaged as principal, with professors of natural history, chemistry, and the veterinary art. So great had been the number of applications for shares and pupils, that the managers had resolved to double the establishment, and it would be ready to receive 200 pupils as soon as the building was completed.

W. PORTER, Esq., seconded the motion. On his own estate he had found benefit from the system. Where there had been an old fashioned drain thirty inches deep, small pipes at the depth of four feet six inches were placed by the assistant engineer, M. Thomson; and so rapid was their effect, that a hole of 3 feet 6 inches, about twelve feet from the drain, which yesterday morning had two feet of water in it, was in the evening quite dry—a convincing proof of the efficacy of the system.

Mr. PARKES wished to guard Mr. Porter against

thinking that in ordinary cases the effect would be so rapid as had been described. Very often there was a little inconvenient bank between the water and the drain, which would require the heat of a whole summer to crack, before the water could run off. He had made drains through what seemed to be a light gravelly soil, and yet within ten feet there would be a bank of clay under, which would not let the water go. The results then would not always be so rapid, but they would be certain.

The resolution was carried unanimously.

S. T. KEKEWICH, Esq., moved the next resolution, "that the position of the company is satisfactory and encouraging." Knowing the great want of capital both in landowners and tenants, he wished the company had funds sufficient to advance money for improvements, which could be repaid by instalments; this would induce many people, who wanted capital, to drain very largely. Sir Thomas had spoken of the advantage of this system to the landowner and tenant. He would rather consider its beneficial effect on the industrious and poor part of our population. The great problem to be solved in this day for the happiness of the country, was to find suitable and remunerating employment for the poorer part of the people. Looking at the vast extent of uncultivated land in this county, and in the whole kingdom, which would be so much improved by draining, he thought if it were properly drained it would not only give employment to a great number of agricultural labourers, but reward them with cheap food out of the very land they had been improving. He hoped the advantages of this company would soon become generally known. There was no danger in signing the deed of settlement, because the company was limited in its operations—could not move when it had no money—could never speculate.

Mr. VENN, of Uffculme, wished to state the result he had experienced from draining. He occupied an estate which he had had for 25 years. His predecessor kept 40 or 50 sheep; he now kept 300 or 400, and had never known an unsound sheep among them for the last ten or a dozen years, except when there was a general failure, and then his sheep were not more affected than others upon dry and healthy land. All this had been done by draining, and he wished the company success.

Mr. PARAMORE said he was quite satisfied with the results of the system of this company. His landlord first gave him leave to have 100 acres drained; he found it good, and obtained permission to drain 40 acres more, and he was only sorry that it was necessary to drain a great deal more than he thought of before Mr. Parkes introduced this system. The effect was immediate. The drains stopped running after four or five days' fine weather a fortnight ago; in the course of the night there was a heavy storm of rain, and the next morning, when he went to the spot, the drain was pouring down at a tremendous rate. He had doubts before this as to the immediate effect; he had thought it would require a hot season or two to break the banks of earth, and let the water pass; but now he was convinced.

Mr. PARKES wished to observe that living in London as he did, and being pretty well occupied with the continual applications made to him to drain land on his system, he could not drain small pieces of twenty or thirty acres without considerable expense; because if he did not go himself, he was obliged to send a foreman of superior skill and ability, as the difficulty of draining a small piece was sometimes as great as a larger surface. It would therefore often be impossible for the smaller farmers to avail themselves of his system, were it not for the assistance of this society—they could neither have the money, nor the tiles, nor the skill; and they must be undrained, or they must fall a prey to parties who pretend to drain, but know nothing about it. The company had also provided a tiliary in the neighbourhood—the first step, without which nothing could be done. Whenever a large proprietor applied to him (Mr. Parkes), the first thing he did was always to erect a tiliary.

The CHAIRMAN said that this very neighbourhood was indebted to Captain Buller for a tiliary, and he had known waggons come to Whimpole to fetch tiles from as far as Mamhead. What must be the inconvenience to those who could not get a tile within 40 or 50 miles? This company would supply the deficiency.

The motion was carried unanimously.—

G. C. HOLROYD, Esq., moved "that interest be paid on the paid-up capital at the rate of four per cent. per annum for the half-year ending the 24th of June next, the surplus profit being reserved till the annual meeting of September, when the amount of dividend will be considered." The auditor had carefully gone through the accounts, and found that this proposition was justified.

Mr. T. HUSSEY seconded the resolution. He had no doubt the sound of this four per cent. would bring up a good many persons who had been waiting to see if the undertaking would yield a profit.

Mr. MANSFORD asked how the subscribers would be situated who had not paid up their calls—how long a notice would be given them?

It was answered that by the deed of settlement the five per cent. deposit is imperatively due within two months, on pain of forfeiture of the shares. The 25th of March was fixed as the last day for the payment of calls by subscribers who mean to come in for the dividend at Midsummer.

A letter was then read from the Earl of Devon, one of the earliest supporters of the company, expressing his regret that he could not attend, and his assurance of continued support.

Letters were also read from Mr. Bradley, land agent, and others, expressing much interest in the undertaking.

Some conversation ensued on the Drainage Bill introduced last session by the Earl of Lincoln. Mr. Hussey had suggested the insertion of a clause giving the drainer power to form an outlet through the lower land of his neighbour, upon paying a fair compensation. The company, at the recommendation of the Earl of Devon, had memorialised Sir Robert Peel on the subject, and Mr. Parkes, who has been engaged in extensive im-

provements at Drayton Manor, had also brought the matter under his notice in conversation; and exemplified its necessity by reference to Sir Robert's own land; but the Premier, having, as Mr. Hussey said, so many other things to think of, had allowed it to slip his memory. The Chairman could assure the meeting that Lord Lincoln's attention had been called to the matter by Mr. Henry Mules, of Honiton, who had been appointed Secretary to the Inclosure Commission, of which his lordship was President.

Mr. KEKEWICH, however, moved the adoption of a petition, to be presented to the Lords by Earl Fortescue,

and to the Commons by Lord Courtenay; which was resolved.

The business of the meeting being now concluded, they relapsed into a conversation on the irrigation of fields, in which Mr. Parkes gave an interesting and instructive account of his mode of underdraining water meadows, so as to preserve the healthy moisture of the soil, and regulate the supply of water by stopping or opening the outfalls. He detailed the experiments on Drayton Manor and Strathfieldsaye with much clearness and precision; and the meeting separated, after voting thanks to their officers and chairman.

AGRICULTURAL CHEMISTRY.

Whether for good or for evil, it is now apparent that the farmer will have to rely upon his skill in the cultivation of the soil to enable him to meet foreign competition. The union of "science with practice" will alone enable him to elevate skill to a high point; and the first step in attaining a knowledge of "science" is to learn its principles. Those principles are most easily acquired, and most firmly impressed on the mind by the means of lectures delivered in a plain and familiar style; and next to hearing a lecture delivered orally, the perusal of a lecture, taken down as nearly as possible in the language in which it was delivered, will be found most effective. In order, therefore, to afford an opportunity more especially to the younger class of our readers who contemplate as an occupation the cultiva-

tion of the soil, we have made arrangements to give a report of a series of lectures about to be delivered by Mr. Nesbitt, the first of which appears below. Mr. Nesbitt has for many years devoted his time and talents to the study of the practical application of chemistry to agriculture. He is the proprietor of an extensive establishment, in which a large number of youths are instructed in every branch of education; but to those ordinarily taught is superadded instruction in those sciences which bear upon the practice of agriculture. We have said thus much in order that our readers may be acquainted with the source from which these lectures are obtained; and we offer this, the first of a series, as a sample of the bulk, being content to leave the quality of the article to recommend it.

AGRICULTURAL AND SCIENTIFIC TRAINING SCHOOL,

KENNINGTON LANE, LAMBETH, NEAR LONDON.

LECTURE ON THE APPLICATION OF CHEMISTRY TO AGRICULTURE.

LECTURE I.

BY J. C. NESBITT, ESQ., F.G.S., M.C.S.I., &c.

Nature of chemical science—Number of elementary bodies—Substances found in animal and vegetable bodies—Organic and inorganic—Nature of manures—Manures are those substances which are capable of furnishing to plants the elements necessary for their growth—Farm-yard dung, bones, &c.

Gentlemen,—In commencing a course of agricultural chemistry I shall endeavour in this, the preliminary lecture, to give you a short and condensed view of the nature of the science, and the advantages which may be derived by agriculturists from the application of the truths of chemistry to the cultivation of the soil. Many of you are aware that within the last few years the application of chemistry to agriculture has much increased; and it is satisfactory to behold, on every side, farmers paying more attention to that important aid than they used to do. I shall now, without further introduction, enter upon the subject of the lecture.

You are made aware of the facts of chemical science by studying nature; asking questions, as it were, of

her, and receiving answers. And it is by collecting these answers, and adding to them by putting other enquiries, that the whole results of chemical science are brought within view. We ask a question when we make an experiment, and the result is the answer; and by varying the interrogations, and putting them first in one shape and then in another, we have the truth fairly brought out.

By experiments repeated thousands of times, and in a vast variety of forms, chemists have discovered that the world we inhabit, and all the vegetables and animals it contains, are made up of from fifty-six to sixty elementary principles of matter which differ from one another in their properties. Of these the greater portion consists of metals, such as iron,

silver, and gold, and also such substances as sulphur and phosphorus, and many others. These substances are all elementary, differing essentially from each other; and they make up the whole of the mineral, vegetable, and animal kingdoms. But many of them are exceedingly scarce, being found only in very rare localities; some only in places where vast volcanic heat has been in operation; some in other localities where circumstances have caused them to be brought up from the extreme recesses of the earth. The great bulk of the earth is composed of from twelve to fourteen of these elements, which are found in large abundance all over the world, in the water, air, and the earth; and it is with these substances, few in number, and with properties easily learned, that the farmer particularly has to do.

We find the earth is composed chiefly of a substance called oxygen. This body constitutes nearly half the weight of all earthy matter, nearly eight-ninths the weight of water, and one-fifth the bulk of air. It is found in all vegetables and animals; and it is, therefore, evident that a knowledge of such a substance must be very useful to agriculturists; and the same remark applies to other substances which are found to exist in vegetables.

It is my intention, in the lectures which I shall have the honour of delivering before you, to proceed, one by one, to the consideration of all those bodies which are found in vegetables—to present to your notice, time after time, a variety of substances, together with their properties, which are most useful to the farmer.

The substances which are found in every soil capable of bearing crops, and which seem essential to that object, may be shortly enumerated. We find, invariably, alumina, which is the base of clay; lime, which is the oxide of calcium; magnesia, which is the oxide of magnesium; potash, which is the oxide of potassium; soda, which is the oxide of sodium; manganese, iron; silica, which is pure sand; phosphoric acid, which is the acid of bones; sulphuric acid, which is a union of brimstone and oxygen; and chlorine, which is the base of spirits of salt. These substances are to be found, in greater or less proportions, in all soils; and upon the presence, in sufficient quantities, of five or six of them depends the power of the land to produce crops. If we examine any vegetable, we find that it generally contains the whole of these substances, with the exception of alumina and manganese. There is a little dispute at present as to whether alumina is taken up by plants, because it is detected in the ashes in such minute quantities as to induce chemists to suppose that it proceeds from that portion of the soil which adheres to the plant which is examined. But manganese does certainly enter into some vegetables, but it does not seem to be essential to their growth.

If we take a vegetable substance, such as wood, and make it red hot, we see it diminish in bulk; and if flame be continued, and air admitted, it will continue to diminish in bulk until a white ash only remains, the quantity of ash varying according to the kind of wood ignited. The parts which have

burned away are called organic parts; whilst those which are left are termed inorganic.

Organic matter is that which forms part of an organ, or performs a function in the animal or vegetable kingdom; and in this view the earthy salts are organic, because they form parts of organs. But, by general consent, the term organic is now confined to those substances which burn away at a red heat, and inorganic to those which are left; we will, therefore, adopt the signification, and use the terms as thus defined.

As I told you, the ash which remains after burning is inorganic; and it must have been derived from the land which produced it, being earthy in its own nature. And when we come to examine it by analysis, we find that the ash contains exactly those substances which we have mentioned as existing in the land, viz., lime, magnesia, iron, potash, soda, silica, phosphoric acid, &c.

That these substances have very great influence over the growth of plants, and are necessary for such growth, may be proved by a few considerations arising out of the nature of vegetables in general. If we examine those bodies which can grow on what are called barren soils, we shall find that they take out a very small portion of the substances of the land; and in proportion as you come to the plants on which the greatest amount of culture is bestowed, you come to those that require an increased amount of the inorganic substances which make up the soil. You are all aware that the pine or fir will grow on a sandy plain, on a barren heath, on the top of a mountain, or in the fissure of a rock; where a scanty nourishment may be procured. But the wood of the fir will not yield more than one-half per cent. of ash; that is to say, if you burn 100lbs. weight of the wood, you will not get more than from 5 to 7 ounces of ash. Take, on the other hand, the oak; it will not grow on a sandy soil, but delights in a clay soil. Those who are acquainted with the geology of the south-east of England will remember the slip of clay land called the "gault," which lies immediately under the chalk hills of Kent and Surrey. The line of this gault clay may be observed for miles by the number of oak trees which grow on it with great luxuriance. It may be observed very well in going by the South Eastern Railway, just as we have passed through the last tunnel between London and Ryegate. In the weald clays of Kent and Sussex these trees grow in great abundance. Now, if we take the wood of the oak, the per centage of ash is much greater than in the case of the fir; out of 100lbs. of wood burned, more than 2lbs. of ash may be obtained. Taking next wheat, we find that the straw of this plant, upon which the farmer is obliged to bestow great pains, takes 7½ per cent. out of the land, and the ear 2½ per cent. If we go farther and turn to another description of crop, which some farmers are in the habit of cultivating with a great deal of pains, and expending upon it more trouble and capital than upon anything else—the hop—we find another singular thing, namely, that the proportion of inorganic matter taken from the land

is much increased. In an analysis of the Farnham hops I found they afforded as much as 10 per cent. of ash; and your fellow pupils, Messrs. Allen and Greenhill, who have just completed an analysis of some hops from Mr. Kipping, of Hadlow, Kent, find them to contain the enormous amount of 15 per cent. of ash.

I wish to point out to you the vast importance of this inorganic matter. If you look to nature in the widest view, you will see that these inorganic substances, which some persons declare to be of no use, are most serviceable, in fact invaluable; and that without their presence in sufficient quantity, certain plants cannot grow. The reason why the oak will not grow where the fir prospers, is, that there is not a sufficient number of substances in the soil, rendered soluble by the rains, to supply each year the inorganic matter to the oak, though there may be enough for the fir; and to furnish the inorganic matters for wheat, hops, and other crops, requires the aid and assistance of man. You must remember that the plant absorbs the matter in a state of solution, and not mechanically. With respect to the organic parts of the plants, they are derived from the air.

I shall now take into consideration the nature of farm-yard manures. These are substances found by experience to be beneficial to the growth of plants; and we shall see if we cannot trace the sources of these manures, and in so tracing them discover the reason why they are useful. Take that, then, which constitutes good farm-yard dung. How is it made? It is made by mixing the urine and excrements of cattle with straw and hay and other fodder, and allowing the whole mixture to undergo a chemical action, a sort of fermentation. After fermentation has proceeded, the farm-yard manure is deposited in the land, and it is invariably found that for all crops it is beneficial; there are substances in it which tend to increase the growth of plants, when placed within reach of the roots. Let us see where they come from. Has the animal any means of producing them by some means or other of manufacture? We know that such is not the case. An animal, whether a cow or a horse, in order to sustain life, eats vegetable food; well, the vegetables, after undergoing a variety of processes in the animal's body, are ejected at last, and when examined, a discovery will be made of what has been taken away in the internal process. A full-grown horse, which feeds on hay, beans, and oats, consumes none of the inorganic matter of its food. The horse has to sustain its own animal heat, and to repair the daily waste of its muscles, by the application of some substance similar in its composition to the muscles. Now, there are certain principles contained in the food which go to supply these and other wants: the gluten, for example, goes to replace the muscles; and certain combinations of carbon, such as starch and sugar, go to afford the heat—in fact they are burned and consumed to afford the animal heat. The same thing takes place in a horse as in a fire-place. When you put coals on a fire, you perceive that heat is given out, certain vapours are carried up the chimney; and if more coals be not

added, nothing will remain but earthy matter which will not burn, with the mixture of a little organic matter. The same thing takes place with the horse as with the fire: the animal requires each day a certain quantity of vegetable food; this is consumed in the body by the air taken in by the lungs, and the vitiated bad air is breathed out, in the form of carbonic acid gas. In the excrements are contained all the inorganic matter, and likewise certain organic substances partially acted upon, such, for instance, as the woody fibre. Thus the excrements of the horse and other cattle, which we find to be useful, are merely vegetable substances, but with some portion of the organic matter taken away. It has also to be remarked that the manure of young growing animals differs from that of the full-grown animal; the reason is, that, in the case of the young, certain inorganic or earthy substances have to go to form their bones, such as the phosphates of lime and magnesia. It has, therefore, become an axiom, that the dung of young stock is not so valuable as that of full-grown animals; the dung of the cow giving milk is, also, not so rich as that from full-grown stock, because a considerable portion of inorganic matter is taken away in the milk. With the exception then of what is required for the sustenance of the body of *growing* animals, the inorganic substances of the food is expelled in the form of urine and excrement.

With respect to the straw which is used to mix with the excrements, we know that it grows in the soil, and we have seen that the excrements are produced from vegetable substances; both, therefore, are derived from the same source—the soil; the animal receiving its nourishment from the vegetables, and the plants deriving nourishment from the land and the air.

We will now inquire whether the vegetable substances are all equally valuable for manure, or whether some of them are not more valuable than others. With respect to inorganic substances, remember that those plants which take a great amount out of the land will be more valuable for manure than those substances which derive most of their sustenance from the air; thus a hundred-weight of hops is more valuable for manure than the same weight of pine wood, of oak, or even of wheat straw. There are some chemists, however, who contend that the organic portion of the manure is of the most value. Boussingault, the French agricultural chemist, estimates the value of manures by the amount of nitrogen or ammonia which they contain. In this opinion I do not coincide; and I wish to direct your attention to one fact which bears out my view as to the extreme value of inorganic matter. If you allow manure to rot, it gets dissipated, as it were. The change arises in this way: when the mass is wet with the excrements of animals, fermentation takes place; the oxygen of the air forms combinations with the organic portions of the manure, which fly off in the form of gases and vapours. Great heat attends the action, and if the farmer does not understand how to temper the heat, there is danger of the manure heap taking fire. Now, what

process has been going on? Why you have been diminishing that portion of the manure which was derived from the air. And is it not singular also that, weight for weight, the remainder is more valuable than the recent dung?

Market gardeners are well acquainted with the properties of this old dung. These men carry farming to the highest pitch, and succeed in obtaining five or six crops a-year by the use of old manure. You see, therefore, that the value does not rest in the organic portion of the manure so much as in the inorganic. I will admit, and wish it to be distinctly understood, that organic matter may be useful; still I wish you to understand that it has by no means the value which is sometimes ascribed to it; but that it is possible to grow plants on soils containing no organic matter. However, all the organic matter on a farm should be carefully collected; for when you have access, it is well to use it. In organic manure, the nitrogen, the most valuable part, may always be prevented from escaping by the action of various chemical substances, such as the sulphate of lime and oil of vitriol. But I wish to show you that inorganic manure is capable of producing everything necessary for the growth of plants.

The volcanic mountain of Vesuvius pours out occasionally vast masses of melted lava in a red-hot state. Upon the lava, after it has cooled for some years and got disintegrated (it is not very solid, but a kind of scoria or dross), the inhabitants of the district are enabled to grow crops of wheat, without the application of any manure. The way they do is this:—a crop of wheat is taken first; then seeds are put in for two years, and then wheat again: thus there is a crop of wheat every third year. Another example is that of the cutters of Heidelberg, who have the privilege of cutting down the underwood of the forests every twenty years. This they burn, covering the soil with the inorganic matter. They then sow wheat, and reap it, receiving in this way a crop of wheat every twenty years, by the application of the inorganic matters collected by the brushwood from the soil in nineteen years.

Now with respect to virgin soils, what are they? Merely accumulations year after year of rich inorganic matter. Plants have lived and died on the same spot for ages; and, consequently, no inorganic matter has been by them removed from the soil. They have, in fact, been accumulating it from the depths of the soil, and bringing it to the surface. If you look to some of the marshes of the Thames, you will find that crops are raised without the application of manure of any kind. Many of these marshes are newly formed land, having been covered by rivers for thousands of years.

In the cases of the virgin soils of Virginia and other places on the American continent, we have warning examples of how the finest soils may be deteriorated by the constant removal of the inorganic ingredients, unattended with a corresponding supply in the shape of manure. These lands, once the

most fertile in the world, for nearly 180 years grew wheat and tobacco year after year without manure. The whole of these crops were either exported altogether from the country, or, at all events, none of the materials withdrawn ever found their way back to the land. The boasted fertility of these regions is now no more; and except in some favoured spots here and there, you can grow no crops without an abundant expenditure of manure.

I will give you other instances. Take the case of bones. These are derived from the vegetables on which the animal is fed; and the vegetables in turn derive the substances of which the bones are formed from the land on which they grow, because in all good soils bone-dust is to be found. Until recently the custom was to pay no attention to bones, and to allow them to be scattered as chance might direct; but it has been discovered that bone-dust by itself produces amazing effects in fertilizing the soil. How can this arise? Surely from nothing else than by merely supplying the soil with an inorganic substance. Some may tell us that the effect is produced by gelatine; but this view is exploded by the circumstance that burnt bones will produce more effect than those which possess the gelatine. It is therefore not the organic matter, but the inorganic which produces such effects; and it acts by affording a certain amount of one substance of which the soil is, in general, the most in need; for owing to the fact that phosphate of lime and magnesia (bone-dust) is only found in any soil in small proportions, and owing to the universal habit of mankind to inter the bones of their species in portions of the earth set apart for the purpose, most soils are more deficient in bone-dust than in any of the inorganic constituents of plants. The application of bone-dust is therefore only an endeavour to repay a debt of long standing. Then there are the nitrates of soda and potash, which are used largely as manures, and amazing results have in many cases been produced. This can be assigned to no other cause than that these manures supply a substance which the plants require. But those who are so void of a knowledge of chemistry as to suppose that the same beneficial results will arise from a continued application of the same manure, will be wofully deceived. Once it may prove useful; but on a second and third application it may prove of no avail. Some persons call these manures stimulants. The term is improper. Manures cannot stimulate the plant; but they can supply its wants.

Another substance which is used largely is the sulphate of ammonia, and it has been found to be of very great utility; and the circumstance is adduced by the advocates of organic manures as a conclusive argument for the employment of organic in preference to inorganic matter. But this cannot with effect be adduced as an argument. It has been proved that unless you have inorganic matter, plants will not take the organic: unless you have phosphates, the plants will not take up the nitrogen. Unless you have the potassa or soda, they will not absorb the

the properties of the different elementary bodies which are found in plants; and I hope that, after having gone through them one by one, and taken a grand view of the whole as met with in the field and in the farm-yard, we shall be able to see in how many ways the farmer may take advantage of the assistance which chemistry affords, in saving and properly applying his manures, in suiting different kinds for different crops, and in reaping all the pecuniary benefits which a proper cultivation of the soil deserves.

THE CORN MARKETS OF EUROPE.

1. Russia will be, according to all appearances, compelled to import rye, barley, and oats, through its ports on the Baltic and the Gulf of Finland. 2. East Prussia will also be compelled to import the same kinds of grain; but, on the other hand, it will be able to export wheat through its ports of Danzig, Elbing, and Königsberg. 3. Sweden and Norway will stand in need of a large quantity of rye and barley, and some wheat; and, seeing the deficiency of their harvest of oats, they will only be able to export a small quantity this year. 4. The countries adjoining the upper part of the Weser will probably require much rye and other descriptions of grain. 5. Holland and Belgium are at present well provided; but the corn and potato crop having been very indifferent in these two densely populated countries, no doubt is entertained that they will, ere long, be seen resorting to our markets to supply their wants. 6. The north of France will be perhaps still compelled to make demands abroad, but they cannot be very considerable. 7. The necessities of England seem to present the greatest interest in this question; Scotland and the north and west of England had a very deficient harvest (last year), and the complaints of the rottenness of the potatoes are general; it hence seems inevitable that England will be compelled to purchase large supplies of grain abroad. As regards the exporting countries, we believe we may state what follows:—1st, Archangel, for rye and oats, whose first supplies, however, cannot reach us before July and August; 2nd, Pomerania, Mecklenburg, Holstein, and Denmark; these countries had an abundant harvest, of which, however, the greater portion has been already exported, and the stores of rye and yellow peas are already much reduced; 3d, Switzerland, as we have said, will only export a few oats; 4th, East Prussia will only be able to supply corn; 5th, the ports of the Elbe and East Friesland will export some corn, but especially oats and beans; 6th, the supplies that will arrive from the Black Sea and the Mediterranean are stated to be very considerable; meanwhile, it is doubtful whether they can exceed those of preceding years; seeing that in the circumjacent countries, as for instance in Egypt and Southern Russia, the last harvest has been barren. The following view of the estimated exportation in the harvest of 1845, from the ports of

the Baltic and the Black Sea, in the north, will show the probable deficiency of this year, compared with the average years:

		EXPORTATION OF GRAIN FROM THE PORTS OF THE BALTIC AND BLACK SEA, AND COMPARATIVE AVERAGES.											
		Average Years.		Harvest 1845.		Average Years.		Harvest 1845.		Average Years.		Harvest 1845.	
		Corn.	Corn.	Rye.	Rye.	Barley.	Barley.	Oats.	Oats.				
		Yards.	1845.	Yards.	1845.	Yards.	1845.	Yards.	1845.				
Russia	Baltic.	45000	25000	4000	..	25000	2000	5000	..				
Prussia	..	22000	18000	8000	8000	18000	18000	2000	..				
Pomerania	..	7000	7000	5000	7030	3000	3000	2000	1000				
Mecklenburgh	..	2000	3500	..	500	2000	3000	1500	800				
Holstein	..	4000	5000	15000	15000	30000	30000	15000	..				
East Denmark	..	25000	12000	6000	8000	9000	4000	800	10000				
Hamburg	..	..	..	..	..	..	..	..	800				
Elbe, West	..	..	..	..	..	..	..	..	..
Denmark	..	..	500	..	..	1000	800	2500	3000				
East Friesland	..	..	1000	800	..	1000	2100	15000	15000				
Total..	lasts	106500	71800	78500	39000	89000	63300	45800	30600				

The exportation of the harvest of 1845 amounts altogether at present to about 30,000 lasts of corn, 22,000 of rye, 30,000 of barley, and 18,000 of oats; hence there remain to be imported from the last harvest 41,800 lasts of corn, 17,000 of rye, 33,000 of barley, and 12,600 of oats.—Giornale del Lloyd Austriaco.

TENANT-RIGHT.—The subject of tenant-right was discussed by the members of the Probus Farmers' Club at their two last monthly meetings, and they were unanimous in the following resolution:—"That it is the opinion of the Probus Farmers' Club that the very important subject of tenant-right, so ably discussed at the London Farmers' Club-House in December last, is worthy the consideration and support of all landowners and occupiers of land in the United Kingdom."

AGRICULTURAL IMPROVEMENT.

TO THE EDITOR.

SIR,—At no former period of our national history have the friends and followers of agriculture been more intensely and laudably engaged in the study of this important concern than at the present time. It is so intimately connected with the general prosperity of the realm, that it is more than ever become a national affair, particularly interesting, not only to those who depend upon the successful prosecution of the business for their livelihood, but all other classes of the community. Its improvement is, therefore, a matter of the greatest importance; more especially as some political economists assert that this country cannot grow corn enough for its own consumption. On the other hand, this assertion is confidently denied by other statistians, who have the best means of arriving at a sound and rational opinion on the subject. In fact, there can be no doubt of the validity of the latter opinion, provided that the powers of the soil were judiciously and generally called forth; and hence the present extraordinary exertions now making to bring about this desirable result. To render Britain independent of foreign countries for the chief article of the people's food is "a consummation devoutly to be wished;" and that such a happy circumstance is within the bounds of practicability, no one thoroughly acquainted with the subject can reasonably deny. It is true that there are difficulties in the way of accomplishing this momentous object, the chief of which is the want of adequate funds. Unluckily, all the contemplated improvements are, in the first place, expensive; and when both landlords and tenants are poor, it is scarcely to be expected that improvements requiring a heavy outlay of money will be carried out by such persons, whose views of ample returns are only prospective. In these cases, the legislature has been moved to lend assistance, by giving liberty to possessors of entailed estates to lay the burden of such advances upon their successors, who are most likely to benefit from permanent improvements executed by their predecessor. And the tenantry have been encouraged to farm with more spirit, either by having leases granted, or by a new law which compels the landlord to reimburse a quitting tenant for all permanent improvements made during his tenure, and which he leaves to his successor.

These improvements are chiefly thorough draining, or other means of improving the staple of the land,

by liming, marling, or by ploughing-in extraordinary dressings of purchased manure, or by keeping and feeding a numerous head of live stock; all which are expensive undertakings, and which a tenant with limited means cannot accomplish. And yet it is said, that, unless such a spirited style of farming be adopted, and universally carried out, the agriculture of the country will remain stationary. Some projectors, in addition to the above particulars, suggest some harsh inquisitorial measures, which they maintain are absolutely necessary in order to insure the result above alluded to, namely, rendering ourselves independent of foreign supplies. In the first place, they advise that no man should be allowed to rent a farm, unless he can show, for the satisfaction of the landlord, that he actually possesses a sufficient capital to begin with. Next, that any tenant who farms badly in consequence of a want of capital, should be compelled to give up a part or the whole of the farm to a more fortunate tenant. Lastly, all sluggards and unskilful tenants should be driven from their holdings without mercy, as they are only drones who occupy stations which should be filled by more able and industrious men.

If such regulations could be voluntarily introduced, although they would be a sweeping interference with the hitherto steady and moderate un-speculating proceedings of the generality of husbandmen, yet it is impossible to deny, that such an impulse given to the practitioners and the practice of farming, would certainly be productive of a vast accession of agricultural wealth. Because, if every farmer now struggling with adversity were sufficiently assisted; were every acre of his farm thoroughly drained and subsoiled, if necessary; were his old cumbrous hedge-banks levelled, and freed from useless pollard trees; were he supplied with every necessary implement, and every out-building necessary for rearing and fattening live stock, his annual returns, in most cases, would certainly be doubled; and then would be realized the flattering dream, that England might be an exporting rather than an importing country.

A national draining system is the most practicable and most rational scheme for improving agriculture that can be devised.

There are tens of thousands of acres in this country, at the present moment, which are too wet

either for the growth of corn, or healthy pasturage. Many of the richest tracts are deteriorated by the abundance of weeds, rushes, horse-tail, sow-thistle, and colt's-foot, all luxuriating in consequence of a want of drainage; a defect, though well known to the tenant, is suffered to exist, merely from a want of a little geological science. "There is no apparent outlet" is the excuse of ignorance, although a *swallow* might be found within a few yards which would lay a considerable portion of a wet field perfectly dry.

The advantages of efficient drainage are manifold; no plant, except aquatics, can thrive in soil saturated with water, air being as necessary to the roots of plants as it is to their stems and foliage; but where water abounds air cannot enter, and consequently no healthy vegetation is produced. Well drained land is also easier and more effectually cultivated. No land can be properly stirred by the plough, or other implement, unless it is free from an excess of moisture; and waiting till the ground is dry enough often occasions the loss of a season which never can be the case on efficiently drained land. Besides, not only is dry soil warmer, but the air immediately over it is warmer also; which combined circumstances accelerate the growth, as well as maturity of the plant.

The next most important and practicable expedient which the present race of British farmers can have recourse to for enriching their land, increasing their crops, and enlarging their profits, is by a constant endeavour to increase the numbers of their flocks and herds, and to adopt such a rotation of cropping as will admit of a frequent repetition of green crops for the purpose of soiling, and stall-feeding live stock. This would enable the tenant to make *at home* great quantities of the best manure, and render unnecessary the purchase of costly fertilizers, now so highly puffed up. This plan of increasing the fertility of his land, and enhancing the value of his crops, is so obvious, that no arguments are required in support of such a style of farming. Nor can any doubt be entertained but that such a style would be adopted generally, unless a want of funds and suitable buildings prevented the attempt; and, wherever such disabilities exist, the tenant is assuredly in fetters, and can neither do justice to himself nor to his country.

Relative to the condition of farmers as a distinct class of British society, much may be observed; many of them are opulent and thriving men, arising either from their command of money, or from their being luckily situate on a naturally rich farm at an easy rent, and where the local burdens are also light; or it may be from their personal skill, and indefatigable industry in business. Any of these incidents will serve to advance some individuals

above their fellows; while a want of these favouring circumstances, will depress others into that state in which a great majority of farmers find themselves placed at the present time, namely, labouring diligently, but finding difficulty to farm without suffering actual loss. There is one obvious and striking anomaly observable in comparing the condition of the farmer with that of tradesmen who are employed in the manufacture of his raw material. For, while the maltsters, the distillers, the brewers, and publicans, have all magnificent establishments, and are thriving people, and while the millers, bakers, and butchers are all carrying on lucrative businesses, as enhanced during the late war, the producers of the raw material have a struggle to make the amounts of their receipts and expenditure fairly to meet at the year's end. This, however, is easily accounted for: middlemen can take care of themselves, by entering into no doubtful or uncertain transactions, and by recharging with a profit the prime cost of their commodities. But this is not so with the farmer, who can but seldom charge what his corn or cattle cost him; the market value being affected by foreign as well as home competition. In this case one thing is evident, namely, that in our social system there is a want of a just balance in the relative value of goods and services; for why should the farmer not have a reasonable share of the profits accruing from the manufacture of his produce? The fact is, the burdens laid upon the land and its cultivators are out of all proportion to those borne by the other classes of the community; because these last, being mostly middlemen, who, as already observed, can, by countercharging, take care of themselves. The heavy duties laid on malt, hops, beer, and spirits, depress the price of barley, &c.; so that it may be reasonably averred, that no inconsiderable share of these duties are indirectly paid by the farmer: the poor, church, and county rates, as well as the highway duties, are all leviable on the tenant; and though all these, as well as tithes, are said to be considered as parts of the rent on taking or leasing a farm, still they are oppressive as being often called for before the crops on which they are payable are carried to market. In hiring a farm, therefore, it behoves an offering tenant to have his eyes open to these particulars before closing a bargain.

In the present unsettled state of British agriculture, it will require a long-sighted, calculating head to determine what conditions to stipulate for in leasing a farm. A well digested system of *corn-rents* will probably be found the most equitable and most satisfactory to the contracting parties. Certainly, as to what may be the condition of British farmers and British farming five years hence, it is impossible to foretell; for it is more than pro-

bable that our ports will, by that time, be partially or entirely open to foreign corn; and then it will be seen whether our markets will be glutted with foreign supplies. And then also it will appear how far the latter will supersede that of home growth, and what activity our open markets will give to foreign agriculture, and consequent advance in foreign prices, and extra charges of freight, &c. All the changes consequent upon any alteration of the corn laws must first be known, before any correct estimate can be made of the value of a farm in this country; and, indeed, it will not be till this disturbance of the corn and other markets settles down again into something like regularity, that any time bargains can be entered into between landlords and tenants.

Many Leaguers are of opinion that the proposed modification of the corn law will very much reduce the price of bread. The price of wheat may be reduced; but that is no reason that bread shall be reduced also: the price of wheat, which includes rent and all costs of cultivation, enters but a very *little way* into the price of bread; the expenses of the miller and baker constituting—say at the present time—nearly *seven-ninths* of the cost of a 4lb. loaf; and which, with the freight added, will apply to wheat of foreign, as well as that of home growth. In fact, there is no knowing what will be the effects of the contemplated alterations until they are fairly in operation. A two years' trial must first be experienced, before the British farmer will know what to be about.

JAMES MAIN.

LECTURES ON AGRICULTURE.

It is now no longer a question if farming shall have its "leaning-post of protection" to depend upon, or if it should be followed as a scientific pursuit—an inquiry into nature's secret ways of producing sustenance for animals.

The lukewarmness and apathetic feeling on the part of farmers to learn or listen to a display of nature's wondrous ways in the mineral and vegetable kingdoms was never more evinced than it has been by the farmers of Hants and Surrey during the past month, when the Mechanics' Institutions of Andover and Farnham engaged Mr. Lance, of Bagshot, to deliver to them two lectures on the sciences relating to agriculture, and invited the farmers of each district to attend these lectures; but such was their little desire to know, that but few would go across the road, much less pay a small contribution to an institution, for the purpose of being informed anything about farming, the remarks being, "they did not want to know anything beneath the depth of the plough"—"if anything more could be found out about farming, it would have been found out long enough before this time"—"I know enough about farming already"—"don't know how to get rid of my barley"—"got too many turnips as it is—what use is it to know how to get more?" &c., &c.

The manufacturer or the artist in any trade, who has to compete with the world, seeks for information of how he can increase production, save labour, and learn causes—the why, and the wherefore.

In the commercial, mining, and manufacturing districts, farmers are not so generally satisfied with their own capacities; for, in the north, Professor Johnston, of Durham, who is a geologist and a chemist, is constantly employed amongst the Scotch

farmers giving information on these subjects; and in Cornwall and South Wales, where mines abound, a superior race of farmers exists, for there are to be found many farmers' clubs, and a spirit of inquiry is abroad; lecturers are appreciated, attended, and warmly entertained.

These remarks are made in consequence of the little attention paid by farmers in general to any book learning or theoretical information, although science is the interpreter of successful as well as unsuccessful practice.

The lectures that have been offered to the farmers could do no other than give them information, certainly could not take from them anything that they already knew.

On the subject of geology, the lecturer described the surface of England, and its division into hill and vale, the soils on these being in accordance with the stratification beneath; that one district of country was famed for one sort of production, and another range of soil or strata yielded a different product. The varied nature of soils was pointed out, and what constituted the difference between a fertile and a sterile one: the structure of the rich alluvial soils on the banks of rivers was explained and shown by analysis, and that it was the business of farmers to imitate these rich soils by adding the simple inorganic matters of which their soils might be deficient. This lecture was elucidated by Knipe's new geological map of England, with also sections and drawings of the order of strata in different parts. Specimens of agricultural soils were shown, arranged from the tertiary beds near London to the primitive ranges of rocks at the Land's End, Cornwall; these soils went to show that in general the surface was in accordance with the rocks beneath.

The lecture on the chemistry of agriculture pointed out the minute parts of soils, and their identification with the component parts of vegetables, the analysis of each being in agreement; for unless phosphate and magnesian lime exists in a soil, wheat cannot be grown with success, and that wheats will vary in their character and quality from the mineral and chemical nature of the soil. The components of air and water was pointed out, and their uses in the structure of vegetables, and as a *media* for the conveyance of extraneous manures to the mouths of vegetables. The varied qualities of manures were pointed out, and that one kind was used by vegetable life for the formation of stem and straw, and that another food went to build up blossom, corn, and fruit. The structure of bread-corn was dwelt on by the lecturer as being a subject of vital importance at the present time, in consequence of a question arising as to the propriety and necessity of foreign corn being imported into this country. The qualities of wheat were shown to arise from various causes, viz., the mineral structure and components of soil, the chemical nature of the manures, and the degrees of latitude or climate. The division of wheat-flour into gluten and starch was pointed out, the former being the macaroni of the Italians, and the latter the stiffener of the laundress. The quality of wheat and of flour varied in value from the proportions of these ingredients. The price of foreign corn is often higher than the best English because of its quality, the demand being for the miller to mix it with the weak starchy wheat grown in this country. It has been said that the same excuse does not hold good with respect to wheat as it does for wool, viz., that the fine wools of Gerinany are wanted to work off and occasion a demand for English coarse wool in the markets of the world; that foreign wheat is not wanted here. But this is not the fact; a late and wet harvest in England occasions the more necessity for a foreign admixture. The Russian (Odessa), Sicilian, Italian, and the south of France wheats have a larger proportion of gluten in their structure; this is the "proof," and the absorbing quality so desired by the baker; some of this wheat contains 31 per cent. of gluten, whereas some of the winter grown English corn will contain only 19 per cent. according to the analysis of Davy. It may, therefore, be concluded that soil, food, and climate, are all naturally combined in the south of Europe to make the strong wheats, such as a miller had said to the lecturer was sufficient to push up the top of the oven. An increase of animal manures incorporated with the soil, and a hot summer, are the most likely to make the stronger wheats, and destroy the necessity of foreign admixture. Manures that contain much ammonia (nitrogen and hydrogen), as

human faeces and guano, have produced wheats that have contained the maximum of "proof," being 35 per cent. of gluten: such is the effect of a proper supply of food to vegetables. It is the *grano-duro* of S. Europe that is so much sought for to yield the gluten; it is a small, hard, and heavy wheat. Hot summers in this country, and not a rich, but light, soil, with proper manure as food, will produce a wheat equally good for the purpose of the miller and baker, but not so good for the purpose of making macaroni. It has also been found that the nitrate of soda will, by means of its nitrogen, force a wheat which will contain a larger than usual proportion of gluten, although the appearance of the grain may not be in its favour in recommending it to the miller, its qualities only being known to the chemist, and to the experience of the baker. The occasional introduction of old beans amongst new weak wheats, and ground together into meal, is often desirable, and has its excuse only from the necessity of the practice when foreign hard wheat cannot be obtained; this admixture makes a lively sack of flour, one that will show "proof" in the oven. Chemists have repeatedly shown that bean meal contains nearly twice as much per cent. of gluten as that of ordinary wheat-flour. This gluten is the fleshing principle, as starch is the carbonaceous matter, which acts by giving warmth, respiration, and fat, to animals. It is by a record of facts, experiments, and observations, that we are likely to add to the science of agriculture; by these details and by trifling experiments we may hope so far to improve the farming profession, as to enable those who now despise science to compete with foreign nations in the production of corn; and nothing is so likely to tend to this end, as that of a knowledge of causes; it is the first step to all curative processes; hence the farmer should know of what his soil is deficient, to enable him to produce corn with success.

Mr. Lance pointed out the necessity of farmers embracing the offers made by the increasing intelligence of the age, remarking that unless they proceed onward in the march of improvement that is going on around them, they must necessarily appear to be retrograding.

The lecturer spoke on several other subjects which ought to interest the farmer, particularly on the diseases to which corn crops are subject; but enough has been said to show how proper it is that the farming interest should be more alive to their present position of having to compete with the world, therefore ought to have a greater store of worldly knowledge.

The lecturer is well known as the author of several works on the theory and practice of farming, and as a lecturer in Hants and Surey on geology and its application to the arts.

SOUTH PETHERWIN PLOUGHING MATCH.

This match took place on the 18th November, 1845, in a field belonging to J. K. Lethbridge, Esq., tenanted by Mr. Medland. The weather was favourable, and the field was well attended by the yeomanry and others of the neighbourhood. Sixteen horse-teams without drivers, and one ox-team with a driver, composed the number of competitors that were to try their skill in the art of ploughing that day. To see the seventeen ploughs start at the given signal, with the really beautiful cattle, the neat harness, and the robust, well-clad, jolly ploughmen, was such a pleasing sight as had only to be seen to be admired. The brave fellows did try their skill to the utmost for the mastery, and performed their work admirably; indeed, it was universally acknowledged that the ploughing was equal to any seen, for the season, in the two western counties.

After the business of the field was ended, a respectable party returned to the Brameath Arms, South Petherwin village, where an excellent dinner was served up in Harvey's usual good style.

Mr. WILLS, of South Petherwin, being called to the chair, he remarked, that he regretted much the absence of Mr. Arundell, who so kindly and ably presided over them last year; all had anticipated the same favour again to-day, but his engagements respecting railroads, he presumed, was the cause of his absence, as he knew his generous and noble heart was with them.

On the removal of the cloth, the chairman proposed successively the usual loyal toasts, which were drunk with feelings characteristic of the yeomanry of England.

On the "Health of W. A. H. Arundell, Esq., the Patron of this Association," being proposed,

The CHAIRMAN said Mr. Arundell deserved the greatest possible respect; for, let the result of the South Petherwin ploughing match be what it may—and no doubt could exist but it would tend to a better cultivation of the land in that district—they must look back to him as the founder of it. As it increased in importance, which he was sure it would, so would their debt of gratitude accumulate to him and his noble house.

The toast was drunk enthusiastically, with three times three, and one cheer more.

The CHAIRMAN rose, and said he had to propose the health of a gentleman; and he was sure they would rejoice in having an opportunity to express the high estimation in which he was held by them.

He knew he had only to name Edward Archer, Esq., and it would at once awaken the best feelings that swelled in their manly breasts. Mr. Archer was well known as a landlord amongst them; his enlightened mind brought him not only to see, but to remove the most obnoxious shackles that fettered his enterprising tenantry, and gave them leases highly creditable to himself and advantageous to all parties, setting an example that all good men would speedily follow. He was now, also, a large occupier of land. "I think he would not be ashamed if he should hear me—I wish he did—call him an extensive farmer. The vast improvement he has made, and is still making, on his home farm, and especially by bringing the waste called the Lenannick Down into cultivation, a piece of land so extensive, and which for many years past grew only heath to starve a few sheep, will, by his judicious management, very shortly become useful and highly valuable—producing food to a great extent for our enormously increasing population. Gentlemen, you all know, and many of you better than I do, the immense sums of money this gentleman weekly pays for manual labour—a circumstance that should never be forgotten by us, and that the labourer should remember to his last hour with gratitude. Not that I would attempt to deny that 'the labourer is worthy of his hire;' but my object is to show you that whoever gives labour to the man whom an all-wise Providence has thought fit to earn his livelihood by the sweat of his brow, gives him an opportunity of providing for himself and family; and whoever deprives him of labour takes away his sole means of support and independence. You are fully aware Mr. Archer is removing a great number of his hedges. Various opinions are expressed on this subject; and now I would ask you, gentlemen, did you ever remember any improvement set on foot that prejudice did not damage by making a deadly stand against it? Most of us must remember the time when small enclosures, hedge-row timber, and bushwood, were thought admirable things; when land was successively cropped with corn until exhausted, and then let to remain dormant and useless for a number of years, to rest, as it was termed; when cattle were to derive shelter from hedges, and hedges alone. Then and in those bygone days, never to return, I grant you it was of little importance whether our fields had the benefit of the sun and a free circulation of air or not. But things are now vastly

changed; our arable land is on the modern principle of alternate cropping. From this circumstance, I feel confident you will agree with me that the removal of useless fences, hedge-row timber, and such like, is highly beneficial to the occupier, by enabling him to cultivate his land better and with less expense, and to use crops of superior quality and increased quantity. I feel I must not detain you longer. I therefore beg to remind you of the interest this gentleman takes in agriculture in general, and give you the 'Health of Edward Archer, Esq., and success to his farming operations.'

It was drunk with great zeal and unanimity.

The "Health of F. Rodd, Esq., High Sheriff of the County" was proposed by R. Pennarden, Esq. The health of this gentleman was drunk with cheers.

After some delay, the CHAIRMAN rose, and said: I have been anxiously expecting to hear some gentleman on behalf of the High Sheriff acknowledge the last toast; but as no one appears to put his hand to the plough, and recollecting as I do when he resided amongst us in this very parish, also the many kind acts of his and his amiable lady to the poor, and in truth to all, I cannot refrain from bearing testimony to his worth. Anything coming from me I feel cannot rise him in your estimation, because I know you all bear the highest respect and esteem for him; I therefore take it upon me to say that on his behalf I thank you for the compliment paid him. As the Trebartha family is before us, I have to claim your indulgence for a few moments. You must all remember the late F. Hearle Rodd, Esq., the uncle of the present owner of Trebartha Hall, and you must also remember the splendid show of cattle he annually offered for sale—his introduction of the turnip husbandry, and his general mode of farming. These matters are so well known to you that it would only waste your time for me to name them; but there is a circumstance or two connected with the benefits which that departed gentleman conferred on agriculture that I am perhaps better acquainted with than some of you. I allude to the time when he lived at Higher Croun, in Egloshayle. There it was that his knowledge of farming so brightly shined. There he introduced the growth of turnips on the correct system, and to the greatest perfection, and conferred a lasting benefit on that neighbourhood. It would be in vain for me to attempt to enumerate his deeds of friendship, kindness, goodness, and charity, during his residence in that neighbourhood. I will, therefore, leave the pleasing task for one that can do it more ample justice, and bring your minds to bear on his usefulness when he afterwards resided at Trebartha Hall. Call to mind, gentlemen, the North Devon cattle, and ask yourselves, Who brought the "pure ones" into this county? Who

gave you the opportunity of improving your stock? And who taught you the way to raise food for your cattle, and, by raising food for cattle, food for man? When I recollect these things, which I have thousands and thousands of times, and hear of this and that being done to perpetuate the memory of some distinguished man, I confess I feel shame for my county, because I believe in no county in England beside would the memory of so great and good a man be allowed to dwindle, forgotten, and to die with those who had the advantage and happiness of knowing his worth.

The CHAIRMAN said he was now about to propose a toast which must be congenial to their feelings, and would come home to the business of the day. He meant "Success to the South Petherwin Ploughing Match." He had before told them that great improvement had taken place in this useful art since last year. He was sure it would be the means of making better ploughmen, and cause the soil to be more productive. This matter alone was sufficient to claim public support, and it afforded him no small degree of delight to see so many highly respectable tradesmen from our neighbouring town of Launceston taking such lively interest in the matter, and favouring us with their company at the table as well as in the field.

Drunk with great zeal.

The ploughmen were all provided with a substantial dinner at the expense of the society, and were now called in to hear the decision of the judges and receive the prizes.

The health of the Judges was proposed and drunk with cheers, and the toast suitably acknowledged by Mr. Palmer, of Lifton, who took the opportunity of making to the ploughman many valuable remarks. They were also addressed by the Chairman in a speech of great length and ability, who clearly showed them the necessity of a good character, perseverance, and industry, strongly impressing on them to carry most fully out the best mode of improving their minds as well as their fields.

The list of prizes awarded was read by the secretary as follows, and gave satisfaction:—

- 1st prize, £1 10s., to Daniel Batten, ploughman to Mr. Jackman, Lawhitton.
- 2nd prize, £1, to William Hicks, ploughman to Mr. Wills, South Petherwin.
- 3rd prize, 15s., to James Downing, ploughman to Mr. Taylor, Trewen.
- 4th prize, 10s., to Samuel Masters, ploughman to Mr. Wills, South Petherwin.
- 5th prize, 7s, to Richard Stacy, ploughman to Mr. Essery, South Petherwin.
- 6th prize, 5s., to John Hooper, ploughman to Mr. Thompson, Launceston.

To young men under 18 years of age.
 1st prize, £1 10s., to William Horn.
 2nd prize, £1, to Charles Pethick.
 3rd prize, 15s., to W. Pearse.
 4th prize, 10s., to Thomas Short.

The health of the Chairman was proposed and acknowledged. Many useful sentiments were exchanged, and the company separated in peace, highly delighted with the proceedings of the day.

METEOROLOGICAL DIARY.

BAROMETER.			THERMOMETER.			WIND AND STATE.		ATMOSPHERE.		
Day.	8 a.m.	10p.m.	Min.	Max.	10p.m.	Direction.	Force.	8 a.m.	2 p. m.	10 p. m.
Feb. 21	in. cts. 30.09	in. cts. 30.09	42	54	47	S. West	lively	cloudy	sun	cloudy
22	29.98	29.88	42	51	51	S. West	brisk	cloudy	cloudy	cloudy
23	29.85	29.76	48	54	31	S. West	brisk	cloudy	cloudy	cloudy
24	29.64	29.45	49	55	52	S. West	brisk	cloudy	cloudy	cloudy
25	29.45	29.76	46	54	47	S. West	lively	cloudy	cloudy	fine
26	29.79	29.70	42	55	52	South	lively	fine	sun	cloudy
27	29.70	29.64	43	56	46	South	variable	cloudy	cloudy	cloudy
28	29.70	29.94	44	58	48	S. West	gentle	fine	cloudy	fine
March 1	30.05	29.95	45	54	46	S. by West	lively	cloudy	cloudy	cloudy
2	29.95	29.95	44	53	43	S. West	brisk	cloudy	cloudy	fine
3	29.90	29.67	41	53	49	S. West	brisk	cloudy	cloudy	cloudy
4	29.38	29.47	43	52	42	S. West	brisk	cloudy	cloudy	fine
5	29.47	29.59	40	51	39	West	gentle	fine	sun	cloudy
6	29.57	29.70	38	52	42	West	brisk	fine	sun	fine
7	29.70	29.78	41	50	40	N. West	gentle	cloudy	sun	fine
8	29.94	30.00	35	53	40	W.W. by N.	lively	fine	sun	cloudy
9	30.08	30.28	34	48	44	E. to N.W.	variable	fine	sun	cloudy
10	30.33	30.38	34	50	41	S. West	gentle	fine	sun	fine
11	30.38	30.50	36	50	38	N. West	gentle	cloudy	sun	fine
12	30.56	30.55	36	46	38	N.E. to S.	gentle	cloudy	cloudy	fine
13	30.45	30.35	31	49	44	Westerly	gentle	cloudy	cloudy	cloudy
14	30.20	30.07	40	52	49	Westerly	brisk	cloudy	cloudy	cloudy
15	30.00	29.90	45	54	47	Westerly	brisk	cloudy	cloudy	cloudy
16	29.63	29.30	42	52	40	Westerly	strong	cloudy	cloudy	cloudy
17	29.40	29.46	34	44	36	N.W. to N.E.	gentle	fine	sun	fine
18	29.57	29.57	28	42	32	N.E., N.W.	gentle	fine	sun	fine
19	29.58	29.57	26	41	34	S. East	calm	fine	cloudy	fine
20	29.57	29.65	31	40	30	North	calm	fine	sun	fine
21	29.65	29.37	24	44	42	S.E., S.W.	strong	cloudy	cloudy	cloudy

ESTIMATED AVERAGES OF MARCH.

Barometer.		Thermometer.		
High.	Low.	High.	Low.	Mean.
30.770	28.870	66	24	43.9
Real Average Temperature of the above period.				
Low.		High.		Mean.
41.58		50.24		45.91

North and N. East Winds... 6½ days.
 South East..... 2
 South and South West..... 11½
 West and to North 10¾

WEATHER AND PHENOMENA. — February 21 — Threatening change. 22 — Rain, occasionally a good deal, in the night. 23 — Cloudy, with drizzling rain. 24 — Rainy part of night, and in the morning. 25 — Wet day. 26 — Starchy cirro-stratus clouds in evening, after a very beautiful day. 27 — Changeable, shower, red sunset. 28 — Warmest day, evening fine and starlight. March 1 — Changeable, fine, cloudy. 2 — Generally overcast. 3 — Cloudy, very windy. 4 — Fine wind and rain. 5 — Profuse rain early. 6 — Sunny and drying. 7 — A hail-shower. 8 — Very beautiful.

9—Rime, warm sun. 10—Fine, but changeable. 11—Fine. 12—Cloudy till sunset; highest elevation of the barometer, but it declined. 13—Chilly and threatening. 14—Cirro-stratus cloudy. 15—Very variable. 16—Very heavy showers; wind chops to north, and the cold commenced. 17—Very keen, but improved. 18—Severe early, day mild. 19—Very cold, but calm and bright. 20—Cold, far more so than at any previous period; *equinox* near midnight, bright but threatening. 21—Great rime, followed by gloom; cold, strong wind from S.W., and rain commenced.

LUNATIONS.—Feb. 25, New moon, 7 h. 32 m. afternoon. March 4; First quarter, 10 h. 32 m.

afternoon—full moon, 13th day, 2h. 42m. morning—last quarter, 20th day, 1 h. 58 m. afternoon.

REMARKS REFERRING TO AGRICULTURE.—The continuous mild weather and capital state of the ground favoured every operation and the growth of crops. The severe and sudden access of cold might check growth, but by no means retard work. A change, however, occurred exactly at the equinox, and rain, as it did in 1845, came on the following day, with a true south-west equinoctial wind. The weather had deteriorated exceedingly since the 12th.

J. TOWERS.

Maidenhead Thicket, March 21.

CALENDAR OF HORTICULTURE.—APRIL.

Retrospect.—In consequence of the very mild character of the weather, every sort of produce has been, throughout the present year, both fine, early, and abundant. We must, in some degree, except the potato; for there, if disease has affected any tuber, it continued to produce its consequences, but—so far as individual experience may speak—not to *extend* them. Thus certain tubers suffered, became mouldy and worthless; but, among four varieties of early kinds, others in close contact with the ones infected remain to this day sound as they were stored. It is the same with late stock, and therefore we cannot coincide with those who take a sombre view of future prospects. Prices do not rise, and no one complains of any difficulty to obtain ample supply. It may elsewhere be otherwise.

Our article commences on the eve of the vernal equinox (*i. e.*, the 19th), and registers the coldest night of the year; for, although two thermometers mark the lowest depression in the early morning to have been 26.5 (*i. e.*, 5½° of frost), yet other instruments not three miles distant tell of 11 degrees—and certainly the cold *felt* was very considerable—and, as three or four rimy mornings followed in succession (March 17, 18, and 19), the critical period does not approach propitiously.

The bloom of wall-fruit at this period was full, and equally distributed; that of pears in many places expanding, and the buds of apples swelling, and of great promise. If nothing fatal occur, plums will abound, and with them vast swarms of wasps. We name this concomitant by anticipation, for it will be remembered that scarcely a wasp was seen last summer. If, then, the broods should be numerous, where are now the parents?

Operations.

VEGETABLE GARDEN.

The frosts of March may have changed the aspect, but otherwise circumstances will be most favourable, because the previous supply of rain has been far greater than that of 1845, and the temperament of the land peculiarly excellent. *The first week* should be devoted to sowing successional crops of peas and beans; of the former, the scimitars, blue imperial dwarf, Knight's green marrow, and the Spanish dwarf, are not to be surpassed; and of broad beans, the Windsor, white and green seeded, are the best in flavour: the long-pod is a prolific bearer, but has little taste; therefore a hybrid progeny between it and the Windsor would be very acceptable. Some years ago, evidence was afforded of success by the result of some rows planted by beans of each sort alternately; for the beans produced in the pods were larger and more plump than those of the long-pod, and more numerous than the Windsor, but partaking the character of both. The stock saved was destroyed by mice, and thus two years were lost. The experiment is again on foot, and a trial is suggested to others. While on the subject of beans, it may be as well to state that Speechly was perfectly correct when he recommended cottagers and others to plant beans among potatoes *in* the rows; both do well, and in no degree interfere. Little as we know of organic chemistry, we have at least seen ample cause to reconcile the fact with the chemical analysis of both, for the inorganic constituents found in their ashes differ so essentially, that they plainly cannot impoverish one another, potatoes liking *nitrous* salt of potassa, while beans coat *calcareous* combinations.

Sow *cabbage*. The true London "York," Vanack,

and Atkin's *early* York, are excellent hearters : Savoys, borecole, red cabbage, Brussell's sprouts.

Beetroot, horn and Surrey carrot, parsnips ; it is fully late, but not too much so. Carrots prefer maiden sandy loam, no matter how light, provided it be fresh, without manure or stones.

Celery and celeriac, sow, in small beds of light, rich earth, to come in for late supply, succeeding to the plants raised by heat ; those seedlings planted on beds of leaves, after removal from the first seed-boxes, should stand a few inches apart, in order to render them stocky and of strong growth.

Leeks and cardoons are sown in drills, to come on for final transplantation—*silver onions*, for pickling, thickly, in the poorest ground.

Spinach, early, and again at the close of the month, sow : this vegetable has been proved here to thrive most luxuriantly by watering with a weak solution of nitrate of soda ; it added strength and verdure to the leaves, and most likely prevented the liability to run to seed.

Sea-kale, in rows two feet apart, the ground deeply trenched and enriched.

Second week.—Sow *kidney beans*, if the ground be in free working condition, and there be sun to warm the drills when first opened, because a dry, warm bed is of great consequence ; but the greater security is derived from sowing three beans in a pot of sandy loam very early in this month, if not done in March, raising them with little water, in very gentle heat, and waiting for a favourable opportunity to transplant when the true leaves have become full and strong ; a dusting of lime will then ward off slugs and snails.

Potatoes : These form the "vexed question" of the present year. Our fears have been awakened to a pitch of restless anxiety by the predictions of an assured extension of the disease to *all* the crops. As remedial and preventive, we venture almost as positively to assert (with some sensible writers) that lime, air-slaked, applied to all the cut surfaces of sets, and dusted liberally along the planted furrows, will succeed. Every potato left in the ground and now raised we have observed to be *sound*, and most excellent at the table. Other stock, kept in boxes, wherever the eyes are full and breaking healthily, are found good, unspotted, and full of juice. We have planted such in confidence, combining a fourth or fifth part of coal-soot with the lime, and are not afraid to bid our readers do the same. This may be presumptuous ; but, as we have also discerned no *mark whatever* of disease in very early tubers planted in a vinery, with nothing but moist sawdust and a small proportion of coal-ashes, our hope is not thereby weakened.

In the last week finish potato-planting. Sow *again*, or plant, for a later supply of dwarf and

runner *kidney* beans, and sow broccoli of all kinds.

Plant slips and rooted portions of the sweet pot herbs.

Remove *asparagus* plants from two-year-old beds, and suckers of globe *artichoke*, to produce new beds ; showery weather particularly suits the latter.

Earth or mould up and stick peas, beans, cabbages, and all growing crops. Kill weeds and frequently dredge the surface, where slugs prevail, with fresh air-slaked lime. *Lime in abundance* is the antidote for superabundant vegetable matter : it fixes redundant *humic acid*, and produces fertility by combining in an almost insoluble condition with what would otherwise be a poisonous ingredient, and barrenness is converted into fertility.

FRUIT DEPARTMENT.

The pine-stove produces ripe fruit in succession. And here it becomes requisite to observe the suckers ; for if there be one or two particularly robust, great advantage is derived from retaining it or them on the mother stock after cutting the fruit. By transferring such plants to deep pots of turfy loam, well drained with charcoal and bone-chips (in lieu of the usual broken crocks), a stock of fine and early bearers is obtained. The *succession* house or pits will receive them, and this department is always to be kept in growing condition by warm, close atmosphere, with full heat. The *fruiting house*, on the contrary, demands plenty of air and great solar power.

Vineries.—The early vinery is ripening its fruit ; therefore water should be withheld, and air—at least, from eight A.M. to three P.M.—given freely in fine weather. Size of berry and figure are obtained by rigid thinning out, by moist heat, and rapid growth, prior to and during the process of seeding ; but flavour is of very great moment ; therefore moisture is abated, and syringing abandoned, while the berries colour and swell.

The second vinery will now demand the nicest eye and steady hand so to thin out the clusters as to leave perfect freedom with excess of space for the utmost enlargement of berries regularly distributed thereon.

Melons, whether in brick-flued pit, upon trellices over a chambered bed, or upon common hotbeds, are to be trained, stopped, and the fruit duly impregnated, care being taken to give abundance of air in bright days, with ample bottom and atmospheric heat. More seeds are to be sown ; but cuttings at a joint of fruitful laterals come quickly forward, and soon produce a melon or two each.

Cucumbers must be managed with similar views as to heat and air ; but in *stopping*, M. Phael's rule (always to nip back the leader *at* the fruitful joints,

and not at the joint beyond it) conduces to pretty and regular fertility.

FLOWER GARDEN.

Sow annuals, biennials, and perennials early; but still trust much to the plants of more tender sorts raised under glass.

Propagate, by division of roots, polyanthuses, campanula, and, indeed, all herbaceous plants that have bloomed or are beginning to grow.

Transplant from the nursery stores every kind of plant that will support the usual weather of April, but avoid any temptation to plant or bed out geraniums and such valuable stock as past experience has taught us are unable to resist a May frost.

Destroy insects, and particularly those of the rose-tree; these gum themselves firmly in the leaves, involving them, and hundreds of fine buds with bloom, in common destruction. The aphid is also most destructive, but can be kept under by tobacco-fumigations, and by dusting with Scotch snuff.

Attend to all the routine required by the shrub-

bery, lawn, cleanness of flower-beds, rolling of gravel-walks, &c., &c.

Evergreens can be successfully removed, fresh ones planted, or stock raised by layering.

The azaleas, and all bog plants usually purchased very cheaply in some of the Surrey nurseries near Bagshot or Sunning, generally are raised up, and sent with compact balls: they are almost sure to succeed, if heath soil, sand, and nice leaf-mould be placed in the holes destined to receive the plants, provided that plenty of soft water be given from time to time, and cakes of moss be laid round each stem to the extent of the hole. The moss keeps in the moisture, and may be retained in its place over the roots by two or three flint stones.

All our true *evergreens*—as the holly-leaved barberry, *Garrya elliptica*, evergreen oak, bay, acuba, arbutus, Portugal laurel, &c., &c., are now removable, and grow well in loam; but they require much attention during parching weather. At present we have promise of a cold, changeable spring.

March 21.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR MARCH.

Notwithstanding the weather of this month has been extremely variable, it has proved unusually mild and vegetative, the time of year considered. Throughout the whole of our great agricultural districts, the supply of natural herbage has been extremely abundant; so much so, indeed, that it has been found impossible to consume even a moiety of it; yet it is very gratifying to be enabled to assert that the young wheat plants are suffering but little, if anything, from premature exuberance, although at one period great fears were entertained lest the mildness of the past winter should have had a prejudicial effect upon them. The slight falls of snow, and the few seasonable frosts experienced since the date of our last report, have unquestionably had a beneficial effect upon them, as well as vegetation in general. In most parts of the kingdom the plough has been in active operation, and a larger portion of the spring crops has been sown, with the land in excellent order for the reception of the seed; while, judging from present prospects, it is fair to presume the remainder of the seed will be deposited this year somewhat earlier than usual.

The accounts which have lately reached us from our flock districts state that a very large number of lambs had been lost from the effects of the epidemic; in other respects, however, they are tolerably satis-

factory, as regards fat stock. The difficulties to which we have before alluded—viz., those of procuring adequate numbers of beasts and sheep to consume the immense supplies of turnips and other pabulum, the produce of the last and present seasons—still continue; hence it has been found necessary to plough in many thousand acres of turnips, in order to allow the land to be prepared for spring corn. This we regard—looking at the severe losses which most of our graziers experienced, during 1844 and 1845, from low prices and deficient supplies of food for their depastured stock—as a most unfavourable circumstance, as it has completely prevented them from obtaining those profits to which they are justly entitled. As might be expected, both beasts and sheep have for some time past greatly improved in weight; but the number of the latter on most farms is far less than has been known at the corresponding period in many preceding years.

The position which affairs having a direct influence upon the interests of the agricultural body have now assumed induces us, on the present occasion, to offer a few remarks to the notice of our readers, who will, we feel confident, agree with us that we have arrived at a period when it behoves every man to “look about him.” In the first place, if we take Sir Robert Peel’s scheme for the gradual

extinction of protection to the producers of wheat in this country, we are struck with surprise that any Minister—whatever may be his pretensions, whatever his ulterior views—should have been bold enough to propose a measure, like that now under legislative consideration, so opposed to the interests of agriculture. We are gravely told that it has been forced upon him by the exigencies of the times—in other words, by the partial failure in the wheat crop last year, and the effects of the rot in potatoes. It is not our intention wholly to oppose the fact that the growth of wheat in 1845 was considerably less than that in 1844; or that a portion of the potato crop in the United Kingdom—Ireland, perhaps, in particular—has not suffered from disease. But, at the same time, it must not be forgotten that at the close of last year's harvest, there was a very large quantity of old wheat on hand; and further, that the actual quantity of potatoes produced was large beyond recollected precedent. We look, therefore, upon the numerous reports which have been so industriously circulated, of a very great deficiency in the supply of those necessary articles of consumption, to have resulted from interested motives. The great question, however, for us to consider is—what is really our present position? Although consumption has steadily increased, from the labouring classes being mostly well employed and in the receipt of good wages, we have every reason to believe, from the most extensive inquiries, that a fair quantity of wheat, perhaps sufficient to meet our wants until after the harvest is gathered, is still in the hands of the farmers. Then we have next to consider—what are the prospects of future quotations? It will not, we presume, be denied that supply and demand regulate prices; hence upon this simple basis we shall ground our observations. Some months since, we were assured by the free-traders that no supplies of wheat, owing to the scarcity in the Ottoman empire, could possibly be received hither from the Mediterranean and Black seas during the greater portion of the present year. But what is the fact? Why, that many thousand quarters have already come in, with every prospect of a large increase as the season advances. The free-trade journals are continually harping upon deficient supplies of English wheat, leaving out of the question altogether the immense quantities of flour which are almost daily pouring in upon us from Canada and the United States—which, of course, have a great influence upon the value of the unmanufactured material—and the returns to our millers, who, for some time past, have been selling flour at a considerable sacrifice. Last year, not less than 950,195 cwts. of flour were received from abroad and our colonies,

630,255 cwts. of which went into consumption; and yet we have now 841,709 cwts. in warehouse! Surely this does not look much like deficiency; and if we refer to the article of wheat, our item will become one of greater magnitude. For instance, the actual quantity in bond on the 5th of March was 1,138,950 quarters; since that time, about 50,000 quarters have come to hand, thereby making the present supply nearly 1,200,000 quarters.

The supplies of wheat brought forward at Mark Lane, and the principal markets in our provinces, have been again moderate. The finest samples of both red and white have moved off steadily, at, in some instances, enhanced rates; but the middling and inferior kinds have met a slow inquiry, at about stationary prices. The sales of free foreign wheat—the quantity of which on offer has been small—have been trifling; yet the quotations have been firmly supported. Bonded grain has commanded rather more inquiry. The finest parcels of malting barley have sold briskly, at full currencies. In other kinds exceedingly little has been doing. The oat trade has been tolerably steady, and prices have undergone very little alteration. Beans, peas, and flour have moved off slowly, at late rates.

At the various cattle markets and fairs the numbers of fat stock have been somewhat on the increase, and of very superior quality: hence the sales have progressed slowly, at, in some instances, slightly reduced figures. As foreign stock will, no doubt, shortly be admitted free of duty, the imports during the past month have been small.

Both hay and straw have sold heavily at low prices, arising from the large quantities on offer. To show the decline in the quotations, we annex the following comparison of those during March 1845, and the present year.

	Per Load.		Per Load.	
	1845.		1846.	
	s.	s.	s.	s.
Meadow hay	70	to 110	63	to 88
Clover do.	90	to 120	88	to 120
Straw	38	to 42	32	to 36

From Scotland, we learn that the young wheats are looking very promising. As is the case with us, the supply of green food is very large, and the stock is fattening under the most favourable auspices. Store animals have ruled high; hence the transactions in them have been comparatively trifling. The corn markets have been but moderately supplied, yet the trade has been in an inactive state, at late currencies.

The shipments of wheat, oats, and flour from the various Irish ports have been on the increase; yet the supplies brought forward in the different markets have been far from extensive. Fine wheat, oats, and flour have been in good request, at full prices. In other articles only a moderate business has been transacted.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Since the date of our last review, the importations of live stock from abroad into London and at the outports have been, compared with those of some preceding months, small, but quite equal to those at the corresponding period in 1845, both as respects number and quality. This falling off in the supplies is to be solely attributed to the Dutch graziers waiting for the passing of the new tariff, by which foreign stock will, in future, be admitted free of duty. This is another of those schemes which will inevitably inflict a lasting injury upon the interests of our graziers; and this we say in direct opposition to the views of those who have stupidly contended that we have nothing to fear from unrestricted competition. Having before explained our views in detail upon this important question, it would be unnecessary to enlarge upon them here; still we may intimate that, immediately upon the tariff receiving the sanction of the Upper House, immense numbers of both beasts and sheep—which are, in point of fact, already waiting shipment at most of the principal ports in Holland—will find their way hither, and which must have a depressing influence upon our quotations. It has been asserted that no national increase has taken place in the arrivals of foreign stock into this country since the passing of the existing laws—at all events such a one as ought to excite alarm for the future. That these assertions are directly at variance with facts, we insert the following imports during the last four years.

	Head.
1842 - - - -	5,350
1843 - - - -	2,100
1844 - - - -	8,007
1845 - - - -	34,426
Grand total -	49,883

Well, then, if the imports have progressed at the above rate, under the influence of a duty, what may be expected when the impost shall have been repealed? It is sheer folly to talk about the inability of the foreigner to supply us with large supplies of fat stock, when it is shown—and we have other indisputable evidence to prove—that the English markets will continue to be heavily supplied by them. Notwithstanding the failures in the attempt to fatten store foreign stock in this country, we feel convinced that ere long very extensive importations will take place for that purpose, when the description of food becomes generally known upon which the beasts and sheep are fattened in the various

distilleries in Holland. Many parties who have purchased lean stock, imported from Rotterdam and elsewhere, have been surprised at the rapid decline in their value from a deficiency in condition, although they have been well fed. It must be understood, however, that the Dutch brew an inferior beer from *unfermented* barley, and which is the principal beverage of the lower classes. As this barley, after being taken from the vats, retains a large portion of its saccharine matter, and is given to the stall-fed beasts in that state, it is possible to presume this may have produced the results to which we have just alluded, which we have done for the special information of our readers. From the commencement to the close of the month, the annexed supplies have arrived in London and at the outports, viz., 749 oxen and cows, and 925 sheep. In March, 1845, there were received into London 257 beasts and 166 sheep; hence it will be seen the importations are still increasing.

On the whole, fair average supplies of beasts have been on sale in Smithfield market during the month, the quality of which has been seldom equalled at this period of the year. The primest Scots, Devons, &c., have been in steady demand at about previous quotations; but the middling and inferior qualities have met a slow inquiry at reduced figures. The numbers of sheep on offer have been small, yet the mutton trade has ruled inactive, and the quotations have declined 2d. per lbs. Lambs have sold steadily at from 5s. 6d. to 7s. per lbs. In the month's early part, veal considerably advanced; but it experienced a decline of 8d. per lbs. on the 27th. The annexed statement shows the numbers exhibited in March last year and the present:—

	1845.	1846.
Beasts	13,400 ..	12,579
Cows	600 ..	521
Sheep and lambs .	122,400 ..	77,010
Calves	396 ..	731
Pigs	2,041 ..	2,081

The comparison of prices is as under:—

	Per lbs. to sink the offal.			
	March 1845.		March 1846.	
	s. d.	s. d.	s. d.	s. d.
Beef	2 4	4 0	2 6	4 4
Mutton ..	2 8	4 6	3 6	5 6
Lamb	5 0	6 0	5 8	7 0
Veal	3 10	5 0	4 8	5 8
Pork	3 0	4 4	3 10	5 2

The bullock supplies from our own grazing dis-

tricts have been thus derived during the past month:—

Norfolk, Suffolk, &c	5,100 head.
Northern counties	1,050
Western do.	2,200
Other parts of England	1,250
Scotland	780

Newgate and Leadenhall Markets have been moderately well supplied with both town and country-killed meat, while the general demand has been in a sluggish state, and prices have not been supported. Beef has sold at from 2s. 6d. to 3s. 6d.; mutton, 3s. 4d. to 4s. 8d.; veal, 4s. 8d. to 5s. 8d.; and pork, 3s. 8d. to 5s. 2d. per 8lbs. by the carcase.

ARRIVAL OF CARCASSES DURING THE MONTH.

	Beasts.	Sheep.	Calves.	Pigs.
Scotland	124	1680	—	1600
Yorkshire	145	2120	—	1910
Lincolnshire	148	640	—	480
Norfolk	91	370	—	360
Suffolk	80	270	—	240
Cambridgeshire	121	550	—	560
Essex	80	500	230	650
Surrey	168	790	260	950
Devonshire	—	—	—	290
Wiltshire	200	380	250	435
Other parts	290	1150	370	1100
Total	1447	8450	1110	8575

—March 28.

REVIEW OF THE CORN TRADE DURING THE MONTH OF MARCH.

With the support of the Whigs, the Whig-Radicals, and the mis-called Conservatives, Sir Robert Peel has got his Corn-importation Bill read a second time in the Commons; the majorities in favour of the measure being—for going into committee, 97; and for the second reading, 88. What now remains to be done in the Commons will be soon got over; and, though considerable opposition may be expected in the Upper House, it is too sure that the days of protection to native industry are numbered, and that henceforth the British farmer must make up his mind to enter into competition with the comparatively untaxed foreign corn-grower. All that now remains to be done by those interested in the cultivation of the soil is to bestir themselves to obtain that redress they are so fully entitled to. The notion of pecuniary compensation cannot, we think, be reasonably entertained; but there are other means of relieving the agriculturists, such as repealing the malt-tax, and removing similar imposts bearing heavily on the land. To expect, however, that anything is to be obtained by passive endurance is the height of absurdity; active exertion can alone help the farmer in his present unfortunate position. We hate the name of agitation, but the pressure from without seems the only plan to succeed with those in power; meetings should therefore be held in all parts of the country, and when it shall have been determined what course is best to be pursued, not a day should be lost in pressing on the Legislature the justice and necessity of granting such measures as farmers shall deem the most likely to put them on something like a fair footing with the rest of the community. Union and co-operation may achieve much; but without meetings, petitions to Parliament, and

other steps to enforce their just claims, the landed interest must expect to be wholly sacrificed by Ministers, to silence the clamour of the manufacturers.

To suppose for a moment that wheat can be profitably grown in this country, with all other matters connected with the land remaining as they are, and the duty on that of foreign growth reduced to a nominal point, is preposterous. In average seasons wheat may be imported from many parts of the Continent, with a good profit to the producer, at 35s. to 40s. per qr., all costs of transit included; and when time shall have been allowed for bringing under culture the boundless surface of the western parts of North America, wheat will probably be laid down here at still lower rates. Under such circumstances, inevitable ruin must be the fate of the tenant-farmers of Great Britain, if means be not taken to lessen the cost of production in this country; and the Government is bound, after having withdrawn all protection, to remove all possible burdens bearing heavily on the land.

The injurious effects of the repeal of the corn-laws will not be fully felt this year; indeed we may say not till such time as a full average crop shall have been gathered; but whenever this takes place, prices must inevitably be beaten down to a very low level. At present we see no reason to apprehend that the value of agricultural produce will be further depreciated, simply from this reason, that the last crop has proved deficient all over Europe, and that the stocks of old corn were generally reduced to a low ebb at the principal continental ports in autumn. It is true we have a large quantity of wheat under lock in the United Kingdom, comparatively little of what was accumulated during the past year having

been entered for home consumption; but, on the other hand, there is scarcely any free foreign wheat in the country, and the millers are completely out of stock; in fact all parties have, for months past, confined their purchases to as narrow limits as their pressing wants have admitted, the expectation of so great a reduction in the duty as that proposed by Sir Robert Peel having deterred them from holding. It is, consequently, very possible that when the liberation of the bonded wheat does take place, a very active demand may be experienced; and, though in the first instance a small decline may take place, we are disposed to think the reduction will be neither important nor permanent.

We are now approaching a period of the year when the aspect of the growing crop must be expected to have material influence on the value of all sorts of corn. So long as appearances continue favourable no great change is likely to occur in prices of wheat; for though we are still of opinion that the last crop was deficient, it is evident that the potato disease was considerably over-rated; and unless there should, hereafter, be reason to fear that the next harvest might prove indifferent, the reduced duties must act as a powerful check to any advance. Up to the present time the autumn-sown wheat is, on the whole, well spoken of. About the middle of the month there were reports that the plant was going off yellow, and in partial instances this was, we believe, the case; practical men do not, however, apprehend any danger, the discolouration of the blade being a matter of little importance provided the root be sound; and we have, certainly, experienced no weather at all calculated to injure the latter. On the whole, we are inclined to think that the check given to vegetation by the night frosts, in the early part of the month, will, hereafter, prove to have benefited rather than injured the wheat-crop; and the prospects are certainly, as far as a judgment can be formed at so early a period, promising.

Towards the close of February, and in the beginning of March, the weather was highly propitious for preparing the land for the Lent crops; and before the middle of the latter month great progress was made with the sowing of barley and oats, and the planting of beans and peas. Latterly these occupations have been interrupted, the recent heavy fall of snow, rain, and hail having rendered the soil somewhat too wet to admit of its being worked with advantage. All field labours are, nevertheless, fully as forward as is usually the case at this time of the year; and where sowing has been completed, the seed has been got in in excellent order. There is, nevertheless, a good deal of out-door work still to be done, and for some weeks to come we must reckon on short supplies from the

growers; a circumstance which will assist in keeping prices at about their present level, even if the new law should come into early operation. For some time past the deliveries from the growers have been very short, and though there has been a general want of confidence, and nothing like speculation, prices of most kinds of grain have gradually crept up, as well at the principal consuming towns, as at the markets in the agricultural districts. On wheat the rise, in most parts of the country, has amounted to 1s. to 2s. per qr. Barley, of superior quality, has advanced to nearly the same extent; and the improvement in the value of oats, since the close of February, cannot be estimated at less than 1s. per qr. That prices should have advanced at all, with the prospect of so great an alteration in the laws as that proposed by Ministers, must be viewed as a proof that the trade is in a very healthy state, and shows how little it would require to cause a material enhancement to take place.

The mere suspicion of damage, however slight, to the growing crop of wheat, would unquestionably give rise to speculation; and a speculative demand superadded to the consumptive requirements must inevitably, in the present position of affairs, occasion a rise. Spring corn is not likely, in the first instance, to be so much influenced by the weather; but from present appearances, we are certainly more inclined to predict an advance than a fall in prices of barley and oats, the supplies of both articles having of late barely kept pace with the inquiry, and stocks in the hands of merchants and dealers being unusually small in all parts of the country.

From the fact of so very large a proportion of the bonded wheat being held in the port of London, business has been kept in a more subdued state at Mark-lane than elsewhere; still quotations have, on the whole, crept up in the metropolitan market since our last notice. The arrivals of English wheat have been only to a moderate extent, and a comparatively small portion of the supply has been from the neighbouring counties; by far the greater part having been from Lincolnshire, Cambridgeshire, and Norfolk. Most of what has been received from these last-named counties has been of coarse, inferior quality, which has rendered the sale difficult; but prime parcels, particularly the best runs of Essex and Kent white wheat, have been in lively request at gradually improving prices. The total rise on the latter has amounted to 2s. to 3s. per qr., and 70s. per qr. has latterly been obtained for really fine samples. Red wheat has not advanced more than 1s. to 2s. per qr. at Mark-lane during the month, and this enhancement has only been paid for the very best dry, well-conditioned parcels. Since the 23rd instant the

inquiry has become less active than it had previously been, and the extreme rates of that day seem to have barely been supported.

Owing to the reduced state of the stocks of free foreign wheat in granary, and to the inferiority of the quality of the little remaining on hand, the transactions have necessarily been on a restricted scale, though good parcels have been much wanted. So greatly have the millers been distressed to obtain the required quantity of old wheat for mixing, that they have been compelled, from time to time, to buy small lots of bonded, and liberate the same. To effect this without paying the 18s. duty, recourse has been had to the facilities afforded by the Grinding in Bond Bill. Rather large quantities of Canadian and other Flour have been put into bond to obtain the certificates thereupon granted, enabling the parties to release a proportionate number of quarters of wheat from under lock. These documents, which are transferable, have been freely selling at such prices as have enabled the buyers to release their wheat out of bond at the rate of 12s. 6d. to 13s. per qr. The payment of even these rates, with the prospect of the duty being shortly reduced to 4s. per qr., shows plainly how very much old wheat must be wanted, and bears out what we have said in the commencement of this article, viz., that though the quantity under the Queen's locks is large, a very extensive vent is likely to be found so soon as the corn-law question shall have been settled; and we have therefore come to the conclusion that less effect will be produced by the liberation than might at first sight be supposed.

The only circumstance which might tend to alter our views of this matter would be large arrivals from the Continent. Should these take place, an anxiety to press sales from on board, to save the landing expenses, would perhaps occasion some depreciation. Latterly the supplies have certainly been more liberal than we had been led to expect, upwards of 60,000 qrs. having come to hand during the four weeks terminating on the 28th March. The bulk of this supply has been from the south-eastern parts of Europe, and is of an inferior quality to that usually received from the Baltic.

Notwithstanding the firm tone by which the trade in wheat has been characterized, and the upward movement in prices of that article, the millers have experienced considerable difficulty in effecting sales of flour, at previous rates. The nominal quotation of the best town-made has remained stationary, at 53s. per sack; but this has afforded no criterion for judging of the actual selling price, an active competition among the millers having led to great irregularity in quotations. In many instances

the article has been sold at less than the cost of manufacture—a state of things which cannot long continue, and we therefore expect that present rates will be at least supported, should our opinion respecting the probable range of the value of wheat prove correct. In bonded flour the transactions have not been important, and little or no change has occurred in prices, good brands of United States having been uniformly held at 28s. per brl.

The arrivals of home-grown barley have been quite moderate, and of foreign the quantity received has been trivial. During the first three weeks in March a gradual and progressive rise took place in the value of the finer sorts; and superior malting qualities, which were scarcely worth more than 35s. per qr. at the close of February, could not, on the 23rd instant, be secured below 37s. to 38s. per qr. This seems likely to be the highest point, and since that has been attained, the inquiry has slackened. The rise in the value of the ordinary qualities of barley has not been so great as realized on the finer sorts; but even the common runs have been sold at prices not previously obtainable. Productive as the last crop of this grain unquestionably was, the stocks in the hands of farmers are now running short, and as we shall have to depend mainly on our own producers for supplies throughout the summer and autumn, our continental neighbours having none to spare, there is a probability of somewhat higher terms being obtained later in the year, particularly for feeding sorts. At present there are only about 83,000 qrs. under lock in the United Kingdom, a good many cargoes having at different times been exported to Holland and Belgium. Of the quantity in bond, 18,000 qrs. are held in London.

The demand for malt has at no period of the month been lively; still the greater part of what has been received coastwise has been disposed of, and generally at full terms. Really fine qualities have, all through the season, been comparatively scarce, and have consequently commanded relatively higher rates than the common runs.

The arrivals of English oats have been quite as large as usual, and about the usual quantity has also been received from Scotland; but from Ireland the supplies have been rather short. On the whole, the receipts have not been quite adequate to the consumptive demand of the metropolis, and the stocks in the hands of the principal dealers have consequently been diminished. There is at present certainly a smaller stock in London than at any previous period for some months past; and if the future shipments from Ireland should (as is presumed may be the case, owing to the increased consumption of oatmeal in that country to make up the deficiency in potatoes) fall off, prices would un-

doubtedly rise here. Already quotations have crept fully 1s. per qr. on fine heavy corn, and good Irish feed oats have been currently selling at Mark Lane of late at 26s. per qr.; whilst prime Scotch potato have realized 30s. per qr., and even more.

Within the last week or two a good many cargoes of foreign oats have been reported; but from the tenor of our continental advices, it does not seem likely that these supplies will be followed up. The stock in bond in the kingdom consisted on the 5th March of 96,983 qrs., of which there were 61,192 qrs. in the port of London. The present duty on this article is 6s. per qr., which will, if the Ministerial scheme be carried, be reduced to 1s. 6d.; it is consequently probable that importers will wait the result before entering for consumption; and most of the cargoes which have lately come to hand have been taken to warehouse with this view.

The operations in beans have been quite unimportant since our last monthly notice; indeed so little has taken place in the article, that it is unnecessary to occupy much space in comment. Up to the 23rd inst. prices were pretty steadily supported; but on that day a decline of 1s. per qr. took place, which has not since been recovered. In foreign beans, there has been still less doing than in English, and the few lots that have come to hand from abroad have been landed in bond for want of purchasers. There were altogether under lock, on the 5th March 13,415 qrs., nearly one-half of which, viz., 6,144 qrs., were held in London.

The finest qualities of peas have met with some attention for seed, and the best parcels have consequently commanded full prices. Secondary descriptions, though not in much request, have also supported their former value; indeed, quotations are a shade higher than they were at the corresponding period of last month.

By our foreign advices it appears that the progress of Peel's Corn Importation Bill through Parliament has been almost as anxiously watched by merchants abroad, as by those engaged in the produce of the article at home. The only difference being that the foreigner expects to reap a great benefit, whilst the British farmer dreads the evil consequences of the measure. The expectation of obtaining a ready vent for all their surplus grain, by shipment to England, and its admission here at a mere nominal duty, has prevented that reaction occurring in prices abroad, which would under other circumstances most likely have been caused by the fall of 8s. to 10s. per qr. which has taken place in the value of wheat in the British markets since November last, and quotations are nearly as high abroad as ever. Thus it will always be: when assistance may be really required, our continental neighbours will not fail to make us pay; but in years

when we grow enough for our own consumption, we shall be inundated with supplies till prices are reduced to a ruinous point. The winter appears to have been of a very mild character all over Europe, and the navigation of the Baltic can scarcely be said to have been stopped. By the latest accounts we learn that all the principal rivers and harbours were so far free from ice as to admit of shipments being made, still comparatively little activity prevailed, all parties being anxious to learn the result of the pending discussion in the English Parliament on the corn-laws, ere entering into important transactions.

At Danzig prices appear to have remained very nearly stationary, and the amount of business done there seems to have been trifling. Of really fine high mixed (old) wheat, the stocks had, we are informed, become very small, and for superior samples the high rate of 58s. per qr. free on board had been asked, whilst fair high mixed had been held at 52s. to 53s., and common mixed (new) at 47s. to 48s. per qr. free on board. Owing to the political state of Poland, it was deemed probable that the supplies from that country would be unusually small, which consideration had imparted additional firmness to holders.

The Vistula was on the 17th March free from ice, but no supplies had yet come down. The weather was then unusually mild, and vegetation much more forward than in ordinary years.

At some of the Lower Baltic ports prices of wheat have slightly receded, similar qualities to those held at the close of February at 48s. to 50s. (viz., superior red of 61 to 62lbs. weight) having lately been sold so as not to stand in more than 46s. to 46s. 6d. per qr. free on board. The freight from Rostock, Stettin, and neighbouring ports, to England, averages 3s. to 3s. 6d. per qr. this spring, which, with insurance and Sound dues, will make the total cost here 51s. to 52s., less duty; whilst similar descriptions may be bought at present in bond, in London, at 49s. to 50s. per qr. There is, consequently, not much encouragement to send out orders to the other side; and it is pretty certain that foreign merchants will not con-sign on their own account with so little prospect of a profit.

Quotations of spring corn are relatively higher than those of wheat all over the Continent; and in the first instance no supplies of importance, of either barley or oats, need be calculated on.

In Holland and Belgium prices of wheat are a trifle higher than in this country; but the difference is not sufficiently great to admit of shipments being made from Great Britain to the Netherlands with advantage. It is likely, however, that some of the wheat which would in ordinary seasons

have been shipped to England will find its way into the Dutch and Flemish markets, which may indirectly assist to support quotations here.

From the southern and eastern countries of Europe we have nothing new to communicate. At Leghorn, Trieste, &c., wheat was, according to the most recent accounts, held too high to lead us to believe that any shipments will be made from those places to Great Britain. At Marseilles, however, a few purchases appear to have been made on English account, principally Polish Odessa, which will stand in, here, 46s. to 47s. per qr.

The latest accounts from America inform us that, owing to the expected reduction in the duties here, flour had been in good request, realizing 5½ dollars at the principal shipping ports in the United States, and at 28s. to 30s. per brl. in the Canadian markets.

CURRENCY PER IMPERIAL MEASURE.

MARCH 23.			
WHEAT, Essex and Kent, new, red	52	58	White .. 54 66
Old, red.....	56	62	Do. 60 64
RYE, old	34	38	New..... 38 40
BARLEY, Grinding, 22 31 Malting	31	34	Chevalier 36 —
Irish	27	28	Bere .. 26 27
MALT, Suffolk and Norfolk.....	58	63	Brown.. 56 60
Kingston and Ware.....	60	—	Chevalier 65 —
OATS, Yorksh. & Lincolnshire, feed	22	24	Potato.. 26 —
Yorkhall and Cork, black.....	22	23	Cork, white 23 —
Dublin	13	24	Westport 24 25
Waterford, white	21	23	Black .. 23 24
BEANS, Tick, new	34	38	Old, small 48 50
PEAS, Grey	56	—	Maple .. 36 —
White	46	48	Boilers.. 50 —
FLOUR, Town-made 46 51 Suffolk 42	— per sk. of 280lbs.		
Stockton and Norfolk 40 41	Irish 44 46		
FOREIGN GRAIN AND FLOUR IN BOND.			
WHEAT, Danzic	52	56	fine — 60
Hamburg.....	50	52	
Roslock.....	52	54	
BARLEY.....	20	23	26
OATS, Brew	22	24	Feed .. 19 20
BEANS	44	—	
PEAS	50	—	
FLOUR, American, per brl.....	28	30	Baltic .. — —

COMPARATIVE PRICES OF GRAIN.

WEEKLY AVERAGES by the Imp. Quarter, from the Gazette, of Friday last, March 20th, 1846.	s. d.		AVERAGES from the corresponding Gazette in the last year, Friday, March 21st, 1845.	s. d.	
WHEAT.....	54	3	WHEAT	45	1
BARLEY	29	4	BARLEY	32	2
OATS	21	9	OATS	21	4
RYE	34	2	RYE	31	1
BEANS	35	2	BEANS	34	7
PEAS	34	9	PEAS	35	8

IMPERIAL AVERAGES.

Week ending	Wheat.	Barley.	Oats.	Rye.	Beans.	Peas.
Feb. 7th	54 3	30 10	21 7	34 2	35 9	35 6
14th	54 9	30 6	21 9	32 7	34 9	35 7
21st	55 0	29 11	21 6	32 10	34 9	34 3
28th	54 6	29 7	21 5	33 4	34 2	35 2
March 7th	54 16	29 3	21 10	33 6	34 11	33 8
14th	51 3	29 4	21 9	34 2	35 2	34 9
Aggregate average of the six weeks which regulates the duty.	54 7	29 11	21 8	33 5	34 11	34 10
Duties payable in London till Wednesday next inclusive, and at the Outports till the arrival of the mail of that day from London ..	18 0	9 0	6 0	0 6	8 6	8 6
Do. on grain from British possessions out of Europe ..	5 0	1 6	2 0	1 0	0 6	0 6

PRICES OF SEEDS.

MARCH 23.

SEED, Rape.....	24l.	26l.	Irish .. —l. —l. per last.
Do, new	25l.	—l.	per last.
Linseed, Baltic..49 41	Odessa 45 47		
LINSEED, Baltic and Russia,	38 10, finer sorts, 43 45 per qr		
Mustard, white 10 12	brown — per bush.		
Linseed Cakes, English..—10l.	10s. to 11l. 0s. per 1000		
Linseed, English, sowing 54 60	crushing 45 47 per qr		
Carraway	44	46	new .. 48 50 per cwt.
Coriander	10	13	per cwt.
Mustard, brown, new....	10	12	white.. 9 11 p. bush
Hempseed	35	38	per qr.
Trefoil	17	24	old.. — new 28
Mediter. & Odessa 44 45			
Canary, 48 49 per qr.	fine 51 52s.		
Tares, Winter	Cs. 0.1. to 0s. 0d.		
Tares, old	— new — per qr.		
Rye Grass, English.....	— — — Scotch — — nominal.		

PRICES OF HOPS.

BOROUGH, MONDAY, March 23.

The demand for Hops has rather improved, but previous rates are current. New Kent pockets, 5l. 5s. to 6l. 10s.; choice do., 7l. to 9l.; Sussex pockets, 5l. 5s. to 6l.; choice, 6l. 15s.

POTATO MARKET.

SOUTHWARK, WATERSIDE, March 23.

The weather during the past week has been very cold, which is favourable to the consumption of Potatoes, and has increased the demand. The wind continuing favourable, brought up the loaded ships from the northern districts, therefore the supply has been equal to the demand; but there was considerable business done at the following quotations:—York Reds, 120s. to 140s.; do. Regents, 70s. to 100s.; Shaws, for plants, 70s. to 80s.; Scotch Reds, 80s. to 90s.

CATTLE INSURANCE.—The importance of insurance is nowhere more evident than in the examples which the *Farmers' and Graziers' Mutual Cattle Insurance Association* have adduced in a very interesting essay on *Pleuro Pneumonia*, which they have just presented gratis to the public with their last prospectus. From it we may make the following analysis of the number of losses which have been paid to different persons whose stocks have suffered from the epidemic:—"In an immense number of instances parties have been paid losses by pleuro pneumonia from 1 to 3 head each.

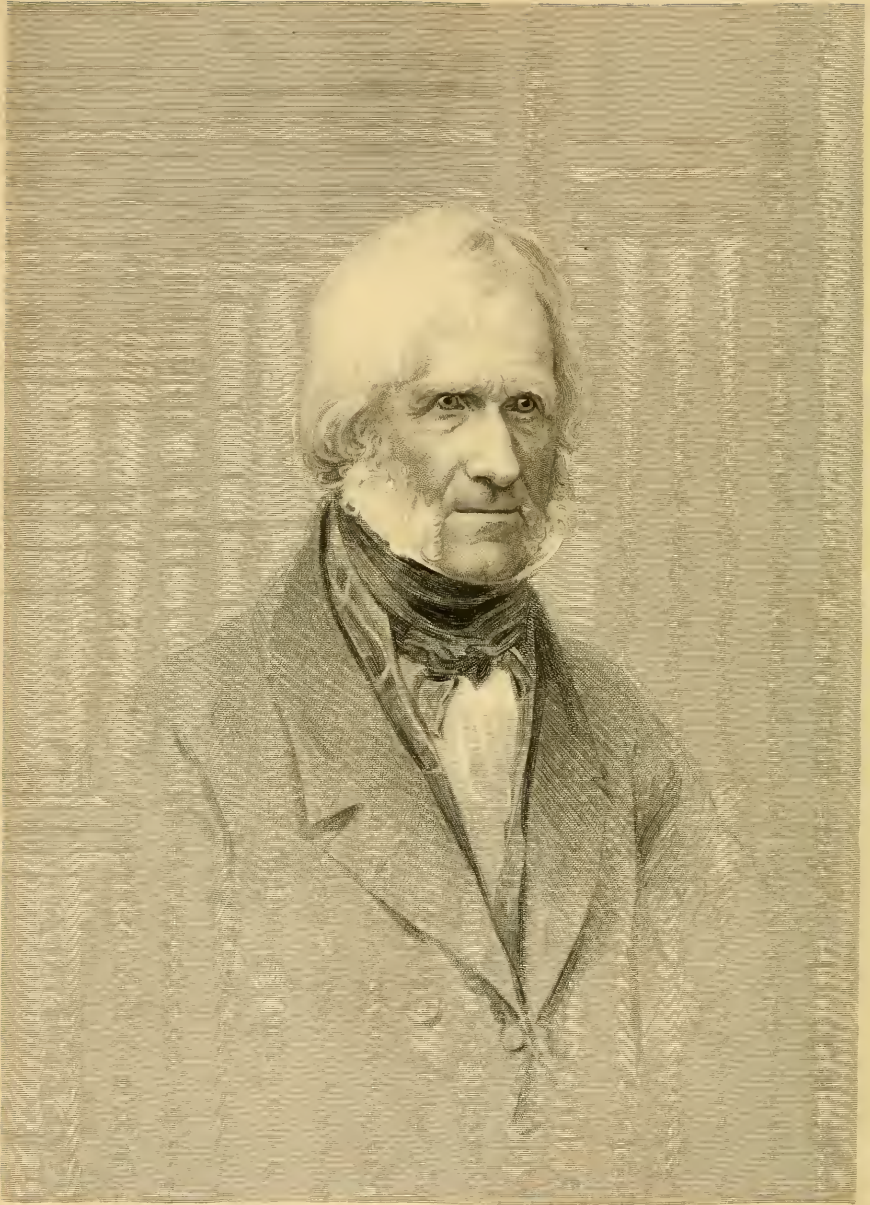
7 persons have been paid for	- -	4 horses
7 " " " " " "		5 " "
6 " " " " " "		6 " "
7 " " " " " "		7 " "
6 " " " " " "		8 " "
5 " " " " " "		9 " "
1 " " " " " "		10 " "
3 " " " " " "		11 " "
2 " " " " " "		12 " "
4 " " " " " "		13 " "
3 " " " " " "		14 " "
1 " " " " " "		15 " "
2 " " " " " "		16 " "
1 " " " " " "		21 " "

This speaks volumes upon the wide spread benefits which this society have afforded to the farmer and stockholder.

PRICES OF SHARES.

Shares.	Div. last half year	RAILWAYS.	Price per Share.		Leeds & Carlisle.....2 1/2 l 1 d 1/2
		Aberdeen.....10 l pd	6		Leicester and Birmingham 20 l 2 2 1/2 pd
		Aunher, Nottingham, Boston, & Erewash Junc.....2 1/2 l pd	0 3/4 a 1/2		Leicester and Redford.....20 l sh 2 2 1/2 pd
21,000	2 l p sh	Armagh, Coleraine, Portrush, 25 l sh 1 1/2 pd	5,100	4 1/2 per ct	Leic., Tam., Cov., & Trnt. Vall. Junc.....20 l sh 4 2 1/2 pd
		Bideford and Tavistock.....1 1/2 l pd	7,968	4 1/2 per ct	Limerick and Waterford 50 l sh 7 1/2 pd
9,500	10s	Birmingham and Gloucester 100 l sh pd	11,475	4 1/2 per ct	Liverpool & Manchester.....160 l sh pd
10,000		Do. New, iss. 7 1/2 dis.....25 l sh 17 1/2 pd			Liverpool Half Shares.....50 l sh pd
30,000		Birmingham and Oxford Junction, 20 l sh 2 1/2 pd			Ditto Quarter Shares.....25 l sh pd
		Boston, Stamford, and Birmingham. 22 1/2 pd	4125000	5 l per ct	Liverpool & Leeds Direct 50 l sh 2 1/2 pd
9,500		Brighton, Lewes, & Hastings, 50 l sh 20 pd			Lpool., Manch., and Newcastle Junction.....2 1/2 l pd
15,000	1 l 8s p sh	Bristol and Exeter.....100 l sh 70 l pd	83		London & Birmingham.....Stock
		Ditto New.....33 1/2 sh 5 l pd			Ditto Thirds.....32 l sh 16 l pd
6,640	12s p sh	Bristol and Gloucester.....50 l sh 30 l pd			Ditto Quarter Shares.....25 l sh 2 l pd
		Bristol and Liverpool Junction 2 1/2 pd			Ditto Fifths.....20 l sh 2 l pd
36,000		Caledonian.....50 l sh 10 l pd	10 1/2 a 1/2		London and Birmingham Extension 25 l sh 1 1/2 pd
51,000		Ditto 1/2 Shares.....25 l sh 2 1/2 pd	2 1/2 a 1/2		London & Blackwall.. Av. 16 l 13s 4d
		Do. Extension.....25 l sh 2 1/2 pd	1 1/2 a 1/2		Ditto New.....2 1/2 l pd
		Cheltenham and Oxford.....2 l pd			Ditto Extension.....5 l pd
42,000		Chelmsford and Bury.....1 1/2 l pd	20 a 19 1/2		London and Brighton.....50 l sh pd
		Chester and Holyhead.....50 l sh 20 l pd			Ditto Consolidated Eighth's 50 l sh 40 pd
		Chester and Manchester.....42s pd			Ditto Fifths.....50 l sh 20 l pd
		Clydesdale Junction.....5 l pd			London & Croydon.. Av. 15 l 15s 9d
		Cork, Blackrock, & Passages 22 1/2 pd			Do. Guaranteed 5 per Ct.. 9 l sh 9 l pd
40,000		Cork and Killarney.....50 l sh 2 1/2 pd	49,077	10s	London and Oxford.....25 l sh 1 1/2 pd
		Cork and Waterford.....25 l sh 1 1/2 pd	11,136		London & Greenwich.. Av. 12 l 15s 4d
		Cornwall.....50 l sh 5 l pd			Preference or Privilege.. Av. 18 l 17s 2d
		Derby, Uttoxeter, and Stafford 20 l sh	46,200	2 l 0s 1/2 pd	London, Hounslow, & Western.....2 l pd
		Direct Manchester (Remington's) 2 1/2 pd			London & South West.. Av. 4 l 6s 10 l
		Do. Do. (Rastrick's).....5 1/2 pd	0 3/4 a 1		Ditto Consolidated Eighth's, 40 l sh 28 l pd
		Direct Northern.....50 l sh 2 1/2 pd	2 a 1 1/2		Ditto New.....50 l sh 12 l pd
35,000		Direct Norwich.....20 l sh 1 l pd	38 1/2 a 3		Ditto New.....40 l sh 10 l pd
		Dublin and Armagh.....1 1/2 l pd			London and York.....50 l sh 2 1/2 pd
21,600		Dublin & Belfast Junction.....50 l sh 5 l pd	7 a 6 1/2		Do. 1/2 Shares.....25 l sh 2 1/2 pd
19,000		Dublin, Belfast, & Coleraine, 50 l sh 2 1/2 pd			London and Windsor.....25 l sh 1 1/2 pd
12,800		Dublin and Galway.....50 l sh 4 l pd	1 1/2 a 2		London, Warwick, & Kidder. 50 l sh
17,000		Dundalk and Enniskillen 50 l sh 5 l pd			2 1/2 pd 1 a 1/2
56,000	3s p sh	Eastern Counties.....25 l sh 14 l 16s pd	20 1/2 a 3 1/2		London, Salisbury, & Yeovil 50 l sh 2 1/2 pd
		Do. New.....25 l sh 8 l 16s pd	5 1/2 pm		Londonderry & Coleraine, 50 l sh 7 1/2 pd
144,000		Do Perpetual, No. 1.. 6 l 18s 4 l sh pd	5 1/2 pm		Londonderry & Enniskillen 50 l sh 7 1/2 pd
144,000		Ditto ditto, No. 2.. 6 l 18s 4d 6 l 13s 4d	1 1/2 a 1/2		Lynn and Ely.....25 l sh 10 l pd
		Do. York Extension.....20 l sh 10s pd	1 1/2 a 1/2		Lynn and Dereham.....25 l sh 10 l pd
4,500		East Dereham and Norwich.....1 l pd			Manchester & Leeds.....100 l sh 8 1/2 pd
2,000		Eastern Union.....50 l sh 25 l pd			Ditto Half Shares.....50 l sh 38 l pd
		Ditto Quarter Shares.....12 1/2 sh 3 1/2 pd			Ditto Quarter Shares.....25 l sh 2 l pd
		East Lincolnshire.....1 1/2 pd	1 1/2 a 1/2		Ditto Fifths.....20 l sh 1 l pd
18,000	1 l 10s ps	East and West of England.....1 1/2 pd	1 1/2 a 1/2		Ditto Sixteenths.....6 1/2 sh 6 1/2 pd
		Edinburgh & Glasgow.....50 l sh pd	72 1/2 a 3		Do. Extension.....42 1/2 pd 3 pm
		Ditto Half Shares.....5 l pd			Manchester & Birmingh. 40 l sh 40 l pd
18,000	7s 6d ps	Ditto Quarter Shares.....12 1/2 sh pd	18 1/2		Do. 1/2 Shares, A.....10 l sh 4 l pd
26,000		Ditto New 1/2 Shares.....12 1/2 sh 10 l pd	15		Do. Do., B.....10 l sh 2 l pd
26,000		Edinburgh and Northern, 25 l sh 12 l pd			Do. Do., C.....1 l pd 7 1/2 ex-d
		Edinburgh and Perth.....3 l pd			Do. Continuation and Welsh Junction.....1 1/2 pd
10,800		Ely and Huntingdon.....25 l sh 5 l pd			Manchester, Buxton, and Matlock. 20 l sh 4 2s pd
		Enniskillen and Sligo.....2 1/2 pd	1 1/2 a 1/2		Manchester, Bir., & Mould Junction.....20 l sh 4 2s pd
		Exeter, Yeovil, & Dorchest., 50 l sh 2 1/2 pd	1 1/2 a 1/2		Manchester to Southampton.....2 l pd
		Goole Doncast. & Sheffield., 20 l sh 4 2s pd	4 1/2 pm		Midland.....Stock
10,918	5 l per ct	Grand Junction.....100 l sh pd	4155400	3 l per ct	Ditto Fifths.....20 l sh 2 l pd
10,918	5 l per ct	Ditto Half Shares.....50 l sh pd	12,500		Ditto New.....40 l sh 18 l pd
8,000	5 l per ct	Ditto Quarter Shares.....25 l sh pd	978500	46s 3 d per ct	Ditto Birmingham & Derby.....Stock
		Grand Union (Nottingham & Lynn) 1 1/2 pd	15,000		Midland Grt. West. (Irish) 50 l sh 10 l pd
		Great Leinster & Munster 100 l sh 7 1/2 pd			Do. Extension to Sligo.....2 1/2 pd
		Great Eastern and Western.....2 1/2 pd	20,000	2 l p sh	Newcastle and Carlisle.....100 l sh
12,000		Great Grimsby & Sheffield, 50 l sh 5 l pd			Newcastle, Durham, and Lancashire Junction.....1 1/2 pd
20,000		Great Southern & Western (Ireland) 50 l sh 15 l pd	16 1/2 ex-d		Newcastle & Darlington Junc.....25 l sh 2 1/2 pd
		Great Extension.....50 sh 15 l pd			Do. New.....25 l sh 1 l pd
		Great Munster.....2 1/2 pd			Ditto New (Brandling).....25 l sh 20 l pd
10,000	3 l p sh	Great North of England.....100 l sh pd	215		Newcastle & Berwick.. 25 l sh 10 l pd
	10s p sh	Ditto New.....40 l sh 5 l pd			Newport and Abercromby.....2 1/2 pd
		Ditto New.....30 l sh 5 l pd			New Ross and Carlou.....2 1/2 pd
		Ditto New.....1 1/2 pd	13 1/2 a 1 1/4		Newry and Enniskillen, 50 l sh 4 1/2 pd
25,000	4 l per ct	Great Western.....100 l sh 8 1/2 pd	145		Newark, Sheffield, & Boston 25 l sh 2 1/2 pd
25,000	4 l per ct	Ditto Half Shares.....50 l sh pd	83		North British.....25 l sh 20 l pd
		Ditto Quarter Shares.....5 l pd	16 1/2 a 15 1/2		Ditto 1/2 Shares.....12 1/2 sh 6 1/2 pd
37,500	1 l per ct	Ditto Fifths.....20 l sh 20 l pd	32 a 1 1/2		Ditto Carlisle Extension, 12 1/2 sh 1 1/2 pd
		Guildford, Farnham, and Portsmouth, 50 l sh 5 l pd			Ditto Dalkeith.....25 l sh pd
		Harwich.....20 l sh 1 l pd			Do. Do.....5 l sh pd
20,000	10 l per ct	Hull and Selby.....50 l sh pd	102 a 100 1/2		Do. North Devon.....2 l pd
8,000	10 l per ct	Do. Quarter Shares.....12 1/2 sh pd	3,186	22s 6d	Do. Northern & Eastern.....50 l sh 50 l pd
8,000		Do. Half Shares.....25 l sh 7 l pd	26 a 5 1/2	7s 6d	Do. Scrip.. Iss. 5 dis.....50 l sh 40 l pd
15,000		Inverness and Elgin.....20 l sh 2 l pd			Do. 1/2 Shares.....12 l 10s sh pd
50,000		Irish North Midland.....1 1/2 pd	12,000		Do. New.....17 pd
		Isle of Axholme.....2 1/2 pd	19,000		North Kent & Direct Dover, 50 l sh 24 l pd
5,000		Kendal and Windermere 25 l sh 1 1/2 pd	19,000		North Staffordshire.....20 l sh 4 2s. pd
16,000		Lancaster and Carlisle.....50 l sh 3 1/2 pd	51 1/2 a 2		North Wales.....25 l sh 3 1/2 pd
		Do. New.....5 l pd	8 1/2 a 3		Norwich and Brandon ..20 l sh 18 l pd
					Ditto New.....10 l sh 5 l pd





G. Hillyard

[Faint, illegible text, likely a biographical note or reference.]

THE FARMER'S MAGAZINE.

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[SECOND SERIES.

PLATE I. PORTRAIT OF C. HILLYARD, ESQ.

PLATE II.

The subject of our second plate is a diagram given in the Government Report "On the relative value of Barley, Malt, Molasses, Linseed, and Bean Meal as food for Cows." It is a new mode of demonstrating such a subject, and will require some study to be understood by our dairy farmers. It will, we expect, be regarded by them as more scientific than practical. From this diagram it appears that the five several articles of food enumerated, stand in the following order of value in producing milk:—1st, Bean Meal; 2nd, Barley and Linseed; 3rd, Barley and Molasses; 4th, Malt; 5th, Barley. See extracts from report, page 400.

C. HILLYARD, ESQ., OF THORPELANDS, NORTHAMPTONSHIRE.

(Late President of the Northamptonshire Farming and Grazing Society.)

ENGRAVED BY J. B. HUNT, FROM A PHOTOGRAPH BY—BEARD.

At the present moment, when, if possible, increased exertion and ability is so generally demanded from the sons of agriculture—when improvement, our rulers tell us, must not only be attempted, but accomplished, and when a true system of economy is so greatly necessary in carrying the farmer through well-experienced, practical preceptors become doubly valuable. Men who, without indulging in wild theory, clothed in fine words, or introducing novelties that but add to expenses, can show the tenant farmer how to improve—can speak to him with a real knowledge and sympathy, from having long tried all they teach, and who write no less with a proud pleasure in their theme than a good use in their effect. The great difficulty in preparing publications on agriculture for the press, is the divided attention between the plough and the pen, the hours that must be spent in the field as well as the closet. It is a difficulty, and a grand one, that comparatively few have the will or the way to meet, while at the same time it embodies a benefit to the whole class of agriculturists, that should cheer as it elevates those who dare to contend with it. In any calling, from the very coarsest to the most refined, the opinion of the working man—the one who gives his whole attention to it hour after hour and day after day—is above all others that we should quote and reason from: it is his *par excellence* we must take as the authority, as from him it is we have confirmation of the bad, and through his practice we trace our way to the good. In no pursuit, moreover, is this more striking or imperative than in that of the farmer. The continual changes that

his labour, far beyond that of others, undergoes from weather and climate, the gradual stealthy process of vegetation, the vast difference in one soil and another, with a thousand other things, render the testimony of the man who has watched and worked with them one and all as indispensable, as generally it is interesting. The number of worthy witnesses who have volunteered evidence of this kind, and published their experience for the benefit of their brethren, we repeat, is not great—the stronger cause for our doing honour to them and their exertions. As, then, "a working man," as one who has spent his morning in the field and his evening in the study, as one who has long contended with and well-mastered the difficulties that oppose the agricultural author—as one who has worked in, and watched the effect of, all winds and weathers on his favourite occupation—and as one who may well, from his own course, show the tenant farmer how to improve, do we usher in the gentleman whose portrait stands prefixed to our present number. To many of our readers the name of Hillyard will be assurance sufficient of our doing its owner nothing more than common justice; while to those who as yet are not so well acquainted with the features or the character of the man, we must give the leading points, in a life as ably as unceasingly devoted to practical farming and grazing.

Mr. Hillyard, now in his seventy-ninth year, from his very boyhood had a strong taste for the life in which he was afterwards destined to play so prominent and good a part. His education, however, and his early pursuits, were, we believe, di-

rected into a less congenial channel, and it was not until his accession to a small estate, by the death of a near relation, that he was enabled to enter on those duties and pleasures which hand in hand meet the intelligent farmer on his rounds. Once well established in a position he had so long coveted, his fitness for it quickly became apparent; while his abilities, from the very first, were to a great extent engaged in furthering the general interests of that occupation of which we have now the pleasure of exhibiting him as so good an example and able a member. In 1811, conscious of the benefit to be derived from mutually aiding and advising each other, he proposed the Northampton County Agricultural Society, and with the temporary support of nearly all the influential men in any way connected with agriculture, succeeded in forming it. This we must consider as the first piece of public good emanating from Mr. Hillyard, though its effect was neither then in accordance with its merit or what it would have been some years later. At that period the whole body wanted either the penetration or energy of its leader; and consequently, after languishing four or five years, the Northampton County Agricultural Society was suffered to drop. Little dispirited by this ill-requited labour, in 1819 he proposed and again established a second society, of much the same description, though rather more confined in its object, and more directly bearing upon the tenant farmers' cause. This was called the Northamptonshire Farming and Grazing Society, to which Mr. Hillyard was at once elected President—an office which he continued to hold for five-and-twenty years, with honour to himself and very available benefit to the Society. The very fact of the founder and President directing or managing the Society for such a length of time, would of itself show that the Northamptonshire farmers met this second effort on their behalf with nothing of that apathy which had characterized their reception of the first. We are happy, however, to add, that we have strong reason even beyond this, to give them full credit for appreciating the labours of their President from another simple fact, which we shall allow to speak for itself, as reported in the county papers of 1837:—

“At the Annual Meeting of the Farming and Grazing Society, held on the 13th of September, the members of the Society having requested Lord Spencer to present to Mr. Hillyard a piece of plate as a testimony of their respect, his Lordship addressed Mr. Hillyard as follows:—‘I have undertaken, at the request of the members of this Society, a duty which is far from unpleasing to me. We have all been aware of the service which you have rendered this Society: we have considered that you were the first to set it on foot, and that but for your constant and unwearied exertion, great sacrifice of time, and, I fear, to a certain extent, great sacrifice of money, it must at times have fallen to the ground. We feel, therefore, that you have conferred a great benefit on this county; and we know that your services have been rendered with a temper and good humour as gratifying as their efficacy. We therefore offer for your acceptance this piece of plate. It is but a small token

of our satisfaction, but I know you will value it in the highest possible degree, because we present it as an acknowledgment of your endeavours, not only to serve this Society, but to promote the agriculture of the whole country (*cheers*). I never felt more satisfaction than in contributing to this piece of plate; and I am most happy in being the instrument by whom the members are pleased to convey it to you. I am sure you will feel the value of the approbation of so large a body of your fellow farmers.’ His Lordship, whose speech was received with very cordial cheers, then presented a large silver bowl, very handsomely chased, and bearing this inscription: ‘Presented to Clark Hillyard, Esq., their President, by the Northamptonshire Farming and Grazing Society, September 13th, 1837.’”

This speaks for itself. Few, indeed, but those who have tried it, can properly estimate the constant and unwearied exertion, the tact, the temper, the sacrifice of time and money required to start a society of this sort, however cordial and unanimous the county may feel towards it. Once put into order, and all is comparatively easy; while the foundation, the organization—*hic labor, hoc opus est*—and none, we are sorry to say, in general, more thankless or liable to misinterpretation. Still, with the above extract before us, we can complain but little on this point as regards Mr. Hillyard, the more especially when we consider the assistance and countenance which the late Lord Spencer gave the undertaking almost from the time of its enrolling the original members. Amongst other steps towards its advancement, his Lordship annually offered prizes for sheep and cattle; while the Society's show of animals, with the ploughing and shearing matches, were held at his beautiful farm, Brampton, near Althorp, the latter, by the way, being generally filled for the occasion with noblemen and distinguished agriculturists. So great, in fact, was the interest taken by Lord Spencer in the Farming and Grazing Society of his native county, that Mr. Hillyard repeatedly offered to resign the President's chair and yield it up to him—an offer as often refused by his Lordship, with the remark, that “as long as Mr. Hillyard had life and health to hold it, the office could not be in better hands.”

The first President consequently continued to exercise his functions until 1843, the year in which Lord Spencer erased his name from the Society, owing to his memorable speech relative to the duties on corn, an absence of support which at once induced Mr. Hillyard to withdraw from the labour of love he had engaged on with a devotion and judgment that promised, as it deserved, a more agreeable termination.

The agricultural society is not the only public institution connected with the town and county of Northampton, which traces its existence to the same source. About ten years since, Mr. Hillyard perceiving the want of, and good likely to arise from, an annual wool fair, determined on trying to establish one—an attempt which, from the samples only being brought to market, did not at first very generally “take.” Latterly, however, since the whole bulk has been sent in, a gradual improvement in attendance and spirit has been observable,

and at present the Northampton Wool Fair evinces every sign of a long and active existence. Farther testimony, again, of Mr. Hillyard's good deeds for all his neighbours, poor as well as rich, may be found in the history of the Northampton Savings' Bank, to start which, he, in conjunction with two other gentlemen, worked night after night in drawing up rules and regulations. These at length finished, a meeting of the whole county was convened, and, under the direction of Mr. Hillyard, the Savings' Bank agreed on—about the second ever opened in this country.

So much for the character Mr. Hillyard has earned around his own homestead: his more widely-extended, though it would be difficult to call them his greater efforts, in the cause of agriculture, have, as we hinted in the outset of this paper, been chiefly made by means of the press. Of his first work, "Practical Farming and Grazing," originally written for the use of his son (a clergyman), we need say little more than that it has already passed through three editions, and that it contains matter as valuable at this moment as when first forwarded to the printer. The style in which it is written, plain, unaffected, and somewhat condensed, is admirably adapted to the class of readers it is intended for, independently of the mass of fact and keen observation illustrating every branch of the subject our author discourses on. Beyond this Mr. Hillyard's pen has been for the most part employed in the periodicals representing the interests of the farmer, formerly in copious contributions to *Ruffly's Farmers' Journal*, and of late years pretty constantly in letters for the *Mark Lane Express*. It was in *Ruffly's Farmers' Journal* that, under the signature of "A Northamptonshire Farmer," he took part in a controversy which excited much interest at the time, on the policy of introducing the Merino breed of sheep as general stock into this country. Mr. Hillyard strenuously opposed the scheme; while the father of the late George Webb Hall, Esq., as "Alpha," was as warm in his support of it. Commonly such a kind of argument ends in either party failing to convince the other; though in this case, notwithstanding the acknowledged ability of their advocate, "the Foreigners," were condemned—a sentence which public opinion and practice has since tended to confirm. Amongst the multitude of other subjects on which our "Northamptonshire Farmer" has ably filled up his leisure, we can only find space for the names and nature of a few of the more important;—"Letters on the injury done to the tenant farmer by large timber being suffered to grow in the fences enclosing arable land, and the bad effects of high and thick hedges generally;" "On the advantages of ploughing up inferior pasture-land to produce grain, and the common good arising from bringing waste-land into cultivation;" "On the great amount of parish rates in populous agricultural districts, from the majority of farmers employing so few labourers, and a proposal for a labour rate to lessen them," &c., &c. In the last of these Mr. Hillyard took an immense deal of trouble, forwarding his circulars to, and soliciting the assent to his proposition from, nearly every member of the House of

Commons. In the midst, however, of his exertions, the Poor Law Amendment Act was passed, and stayed his proceeding further. On this point Mr. Hillyard's practice was quite in accordance with his precept, having employed, we believe, to the extent of his holding, more regular labourers than any other man in the county.

Any observations of ours, after this, on Mr. Hillyard as a good, practical, and eminent British farmer, can be little more than superfluous. One visit to Thorpeldands* would give the best proof of its master's ability to treat on farming and grazing—beautifully clean and abundant crops of grain to speak on the one part, and well-fed, well-cared for, and well-selected stock on the other. As regards the cultivation of the arable land—about two-thirds, in a farm of two hundred acres—we may more especially direct attention to the Swede turnips and mangel wurzel (the growth of which Mr. Hillyard was one of the first to persevere in), obtained with nothing but home-made manure, and the efficient and economical system of ploughing with two horses abreast. In grazing, the nature of his land has not allowed him so great a scope, though as a stall-feeder of cattle we believe him to be amongst the very largest in the county, and as such, a constant exhibitor at the principal shows, but not with that general success which might have been imagined, from his never having had good grazing land to get his beasts in good condition before putting them into the stalls. In 1838, he gained the Gold Medal, with a beautiful North Devon ox. He has some beautiful cattle, which he bred out of a Scotch cow, put to a pure bred short-horned bull, which are suited to pastures not good enough for well bred short-horns. His crosses of the Leicester and Southdown are very promising, although he considers them as yet scarcely allowed sufficient time to arrive at their real excellence. As a correct judge of stock generally his opinion is eagerly sought, and as such he frequently officiates as judge at public meetings.

Mr. Hillyard is an original Member of the Council of the Royal Agricultural Society; has been an attendant at most of the leading Agricultural Societies in the kingdom, and on terms of intimacy with the majority of our leading agriculturists: amongst others, he long enjoyed the friendship of the late Earls Spencer and Leicester, at whose mansions he was ever a welcome guest, and to the latter of whom he in 1840 dedicated his third edition of "Farming and Grazing." With a few words from this said dedication, used in the same good spirit it was first offered, but now applied to Mr. Hillyard himself, would we close our sketch:—"We have only to express our most ardent wishes that the valuable life which has been prolonged some years beyond what is called the life of man, may yet be further spared to his own family, and to the British agricultural community."

* Mr. Hillyard, we are informed, purchased this property in 1814, but sold it again a few years ago to Lewis Loyd, Esq., the banker, who has also bought the Pytchley and Overstone estates, with most of the land adjoining in Little Bitting, Sywell, and Abington.

REPORT TO HER
ON THE RELATIVE VALUE OF BARLEY
EXPERIMENTS ON THE FATTENING OF TWO BULLOCKS.

Commenced 1st October, 1845.

BULLOCK A WEIGHED 9 CWT. 7 LBS.

DATE.	Food in lbs.			Dung.	Weight of Bullock.			
	Hay.	Barley.	Turnips.		Cwt.	lbs.		
1845. October	1	10'2346	6	..	....	9	7	
"	2	10'2346	6	..	32'6156			
"	3	13'8125	9	..	40'2187			
"	4	9'0937	9	..	37'8750	9	10	
"	5	13'8750	12	..	26'0898			
"	6	11'7187	12	..	29'0898			
"	7	17'6562	12	..	37'3125			
"	8	14'9687	12	..	41'7851	9	93'5	83'5 lbs. Increase.
"	9	15'4843	12	..	46'6289			
"	10	18'4921	12	..	35'8750			
"	11	22'4140	12	..	45'9218			
"	12	22'4179	12	..	43'4453	9	101	7½ lbs. do.
"	13	22'5312	12	..	41'5234			
"	14	21'4765	12	..	38'1523	10	4	15 lbs. do.
"	15	21'9765	12	..	37'5625			
"	16	22'1132	12	..	37'9375			
"	17	22'6562	12	..	40'8515			
"	18	21'6210	12	..	43'9648	10	14'5	10½ lbs. do.
"	19	16'8320	12	..	41'7187			
"	20	7'7421	12	..	33'5117			
"	21	5'0625	12	..	27'7812			
"	22	10'8789	12	..	31'5976	9	104	22½ lbs. Decrease.
"	23	10'9414	12	..	41'6210			
"	24	16'7500	12	..	38'6718			
"	25	9'7031	8	56	34'2031	10	17½	15½ lbs. Increase.
"	26	14'4687	8	56	43'4002			
"	27	12'8281	8	56	47'2968			
"	28	8'7812	8	56	37'7812			
November	8	10'0000	8	56	28'6250	9	83	46'5 lbs. Decrease.
"	9	8'9375	8	56	26'6250			
"	10	7'9375	8	56				
"	11	9'1250	8	56	27'6289			
"	12	13'1289	8	56	32'4687	9	104	21 lbs. Increase.
"	13	9'4453	8	56	26'5273			
"	14	5'6757	8	56	21'8125			
"	15	8'6093	8	56	28'0785	10	20	18 lbs. do.
"	16	9'2109	8	56	32'6875			
"	17	11'1835	8	56	36'1835			
"	18	10'8359	8	56	33'8867			
"	19	10'2860	8	56	29'0315	10	18	2 lbs. Decrease.
"	20	8'0078	8	56	33'2500			
"	21	13'4062	8	56	33'2500			
"	22	13'0546	8	56	26'7500	10	34	16 lbs. Increase.
"	23	11'0312	10	56	43'9375			
"	24	11'5781	10	56	37'0117			
"	25	4'6875	10	56	42'5000			
"	26	11'0195	10	56	35'8750	10	51	17 lbs. do.
"	27	11'6171	10	56	38'7500			
"	28	10'7187	10	56	45'0312			
"	29	12'0703	12	..	29'2656	10	49	2 lbs. Decrease.
"	30	10'3632	10	56	31'8750			

MAJESTY'S GOVERNMENT.
AND MALT IN FATTENING BULLOCKS.

EXPERIMENTS ON THE FATTENING OF TWO BULLOCKS.

Commenced 1st October, 1845.

BULLOCK B WEIGHED 10 CWT. 106 LBS.

DATE.	Food in lbs.			Dung.	Weight of Bullock.			
	Hay.	Malt.	Turnips.		Cwt.	lbs.		
1845.								
October	1	8'5859	6	..	41'7695	10	106	
"	2	13'8984	6	..	30'2578			
"	3	10'0000	9	..	32'8867			
"	4	10'0000	9	..	25'2109	11	30	
"	5	15'0468	12	..	36'4023			
"	6	11'0312	12	..	34'9296			
"	7	17'7500	12	..	42'6210			
"	8	14'9687	12	..	41'7851	11	56	26 lbs. Increase.
"	9	15'3710	12	..	30'5585			
"	10	18'3320	12	..	53'9882			
"	11	22'3515	12	..	40'9101			
"	12	21'9921	12	..	42'1210			
"	13	22'5312	12	..	41'5234			
"	14	22'1523	12	..	47'4375			
"	15	21'6484	12	..	42'3828	11	84'5	28'5 lbs. do.
"	16	22'1132	12	..	37'0820			
"	17	22'2031	12	..	40'4648			
"	18	22'0742	12	..	46'9609	11	66	18'5 lbs. Decrease.
"	19	16'2265	12	..	42'6875			
"	20	13'8437	12	..	42'0000			
"	21	18'9296	12	..	47'9531			
"	22	10'9687	12	..	40'6250	11	98	32 lbs. Increase.
"	23	16'0273	12	..	41'1093			
"	24	10'5312	12	..	32'8085			
"	25	6'8945	8	56	24'9609	11	89'5	8'5 lbs. Decrease.
"	26	10'2265	8	56	32'3242			
"	27	11'1250	8	56	22'6250			
"	28	9'6601	8	56	25'1562			
November	8	10'0000	8	56	29'8437	11	36	53'5 lbs. Decrease.
"	9	12'7968	8	56	27'8281			
"	10	10'8893	8	56	32'0156			
"	11	8'9648	8	56	27'7500			
"	12	11'2382	8	56	37'9687	11	52	16 lbs. Increase.
"	13	10'7734	8	56	38'5468			
"	14	8'4531	8	56	35'5976			
"	15	8'9531	8	56	39'2851	11	58	6 lbs. do.
"	16	12'8671	8	56	33'9609			
"	17	15'0000	8	56	42'1250			
"	18	13'5703	8	56	42'8906			
"	19	10'2460	8	56	29'0312	11	68	10 lbs. do.
"	20	12'2734	8	56	38'5625			
"	21	13'5625	8	56	43'8750			
"	22	11'7812	8	56	37'9414	11	90	22 lbs. Increase.
"	23	13'4687	10	56	33'5000			
"	24	13'7655	10	56	42'3750			
"	25	11'0312	10	56	43'9375			
"	26	14'4921	10	56	39'3671	11	92	2 lbs. do.
"	27	9'8828	10	56	40'6250			
"	28	10'1406	10	56	32'4375			
"	29	8'5000	12	..	29'6875	11	96	4 lbs. do.
"	30	14'2812	10	56	29'2421			

Experiments on the Fattening of Two Bullocks—*continued.*

BULLOCK A.

DATE.	Food in lbs.			Dung.	Weight of Bullock.			
	Hay.	Barley.	Turnips.		Cwt.	lbs.		
1845.								
December	1	8'8828	10	56	32'1406			
"	2	13'7343	10	56	31'8750			
"	3	13'7109	10	56	40'5937	10	46	3 lbs. Decrease.
"	4	12'9548	10	28	40'5312			
"	5	11'1953	10	28	35'2343			
"	6	7'3437	10	28	35'2812	10	53	7 lbs. Increase.
"	7	7'7265	10	28	19'5156			
"	8	12'0862	10	28	30'9843			
"	9	18'0000	10	28	44'2656			
"	10	15'0000	10	28	43'7500	10	80	27 lbs. Increase.
"	11	15'0000	12	28	45'7031			
"	12	13'0703	12	28	37'6015			
"	13	13'4453	12	28	37'0000	10	63	17 lbs. Decrease.
"	14	11'4804	14	28	43'6406			
"	15	10'2031	14	28	38'5312			
"	16	7'0546	14	28	38'0937			
"	17	8'3906	14	28	18'1250			
"	18	6'1562	14	28	18'9843			
"	19	4'3085	14	28	18'7500			
"	20	2'0742	14	28	20'5937	10	86	23 lbs. Increase.
"	21	7'0625	14	28	18'1093			
"	22	4'9609	14	28	25'5937			
"	23	11'0078	8	..	28'5625			
				Oil Cake in lbs.				
"	24	14'0000	8	2	27'2500			
"	25	13'8984	8	2	30'5937			
"	26	15'0000	8	2 }	80'5937			
"	27	10'3359	8	2 }				
"	28	11'0546	8	2	23'6250			
"	29	9'8750	10	3	17'5937	10	41	45 lbs. Decrease.
"	30	7'8437	10	3	22'5468			
"	31	14'0000	10	3	21'6015			
1846.								
January	1	10'3437	10	3	24'2695			
"	2	14'0000	10	3	20'3437			
"	3	12'5859	10	3	30'0625	10	85	44 lbs. Increase.
"	4	13'0390	10	3	32'1250			
"	5	11'1093	10	3	30'0546			
"	6	13'1015	10	3	29'4687			
"	7	12'7500	10	3	34'4375			
"	8	13'4531	10	3	39'3906			
"	9	12'7343	10	3	30'0156			
"	10	9'7157	10	4	37'3750	10	84	1 lb. Decrease.

Experiments on the Fattening of Two Bullocks—*continued.*

BULLOCK B.

DATE.	Food in lbs.			Dung.	Weight of Bullock.		
	Hay.	Malt.	Turnips.		Cwt.	lbs.	
1845. December	1	13·9765	10	56	30·2500		
"	2	15·0000	10	56	33·7243		
"	3	14·2265	10	56	39·5000	12	36
"	4	13·2812	10	28	43·4843		
"	5	13·3476	10	28	43·6093		
"	6	13·0000	10	28	35·6073	11	100
"	7	14·3281	10	28	28·5000		
"	8	15·0000	10	28	46·6875		
"	9	15·0000	10	28	40·4687		
"	10	15·0000	12	28	44·4375	12	40
"	11	14·3359	12	28	40·8437		
"	12	13·7187	12	28	45·8125		
"	13	13·3085	12	28	41·0078	12	42
"	14	14·0000	14	28	43·0312		
"	15	13·4062	14	28	43·3750		
"	16	13·6875	14	28	41·4687		
"	17	12·8515	14	28	40·0937		
"	18	9·5940	14	28	42·5781		
"	19	12·8164	14	28	41·1250		
"	20	9·4062	14	28	32·1992	12	42
"	21	10·5078	14	28	29·6875		
"	22	7·0937	14	28	21·2812		
"	23	9·5234	8	..	25·7031		
				Oil Cake.			
"	24	12·7890	8	2	35·2500		
"	25	11·6875	8	2	34·4375		
"	26	15·0000	8	2 }	60·7656		
"	27	17·9414	8	2 }			
"	28	10·5312	8	2	30·5000		
"	29	12·1718	10	3	28·1875	12	8
"	30	10·5546	10	3	30·6953		
"	31	12·5820	10	3	20·5546		
1846. January	1	13·2265	10	3	35·7343		
"	2	14·4843	10	3	30·7226		
"	3	12·7187	10	3	34·8046	12	36
"	4	13·7382	10	3	32·3046		
"	5	13·3906	10	3	41·9921		
"	6	14·0390	10	3	36·9531		
"	7	14·0625	10	3	49·5625		
"	8	14·4921	10	3	40·2500		
"	9	15·0000	10	3	35·7187		
"	10	13·2500	10	4	33·7187	12	61

40 lbs. Increase.

48 lbs. Decrease.

52 lbs. Increase.

2 lbs. do.

No Change.

34 lbs. Decrease.

28 lbs. Increase.

25 lbs. do.

Experiments on the Fattening of Two Bullocks—*continued.*

BULLOCK A.

DATE.	Food in lbs.					Dmg.	Weight of Bullock.			
	Hay.	Barley.	Oil Cake.	Turnips.	Bean Meal.		Cwt.	lbs.		
1846.										
January	11	10·2031	10	4	..	..	26·4531		
"	12	7·1484	10	4	..	..	26·7734		
"	13	12·8750	10	4	..	..	37·5000		
"	14	13·0546	10	4	..	..	44·7500		
"	15	8·2343	10	1	14	$\frac{1}{2}$	39·5321			
"	16	12·3125	10	$\frac{1}{2}$	14	$\frac{1}{2}$	29·0468			
			Malt.							
"	17	12·1015	10	0·75	14	0·75	30·3281	10	81	3 lbs. Decrease.
"	18	10·9531	10	1	14	1	27·7187			
"	19	9·2656	10	1	14	1	30·125			
"	20	9·9843	10	1	14	1	28·9531			
"	21	7·8554	10	1	14	1	40·2312			
"	22	12·2460	10	1	14	1	29·9687			
"	23	11·4687	10	1	14	1	34·1953			
			Barley.							
"	24	11·8715	10	1	14	1	38·4804	11	5	36 lbs. Increase.
"	25	13·2157	10	1	14	1	28·1562			
"	26	13·6093	10	1	14	1	24·6250			
"	27	10·1562	10	1	14	1	23·6250			
"	28	8·2031	10	1	14	1	26·1093			
"	29	7·3593	10	1	14	1	23·2812			
"	30	9·7500	10	1	14	1	17·5312			
"	31	7·9218	10	1	14	1·5	20·3906	11	1	4 lbs. Decrease.
			Malt.							
February	1	2·0000	10	1	14	1·5	24·6875			
"	2	3·3164	10	1	14	1·5	23·5625			
"	3	4·4062	10	1	14	1·5	20·2656			
"	4	6·3359	10	1	14	1·5	27·6835			
"	5	9·0390	10	1	14	1·5	27·0000			
"	6	8·3398	..	4	28	2	29·8554			
"	7	9·4726	..	4	28	2	32·8085	11	5	4 lbs. Increase.
"	8	10·6875	..	4	28	2	30·0625			
"	9	12·4531	..	4	28	2	30·0625			
"	10	11·7500	..	4	28	2	35·0625			
"	11	13·7460	..	4	28	2	39·9726			
"	12	14·3593	..	4	28	2	40·3750			
"	13	12·7500	..	4	32	2	36·2500			
"	14	13·2812	..	4	32	2	37·3203	11	12·5	7·5 lbs. do.
"	15	13·2812	..	4	32	2	41·1718			
"	16	15·0000	..	4	32	2	39·4687			
"	17	13·7890	..	4	32	2	42·4375			
"	18	9·2500	..	4	32	2	29·4335			
"	19	12·6210	..	4	32	2	31·3828			
"	20	11·5390	..	4	32	2	24·7343	11	16·5	4·5 lbs. - do.

Experiments on the Fattening of Two Bullocks—continued.

BULLOCK B.

DATE.	Food in lbs.					Dung.	Weight of Bullock.		
	Hay.	Malt.	Oil Cake.	Turnips.	Bean Meal.		Cwt.	lbs.	
1846.									
January 11	15·0000	10	4	..	..	40·5000			
" 12	14·3906	10	4	..	..	51·5312			
" 13	15·0000	10	4	..	..	46·6250			
" 14	14·5390	10	4	..	..	41·1875			
" 15	14·0546	10	..	14	1	44·4375			
" 16	13·2343	10	½	14	½	34·5312			
		Barley.							
" 17	12·4687	10	0·75	14	0·75	36·0468	12	86	25 lbs. Increase.
" 18	13·3828	10	1	14	1	35·9375			
" 19	13·1875	10	1	14	1	29·8125			
" 20	12·7968	10	1	14	1	30·0937			
" 21	14·5390	10	1	14	1	31·6562			
" 22	13·8984	10	1	14	1	35·3437			
" 23	13·8202	10	1	14	1	39·0078			
		Malt.							
" 24	15·0000	10	1	14	1	34·2387	13	89	3 lbs. do.
" 25	14·2656	10	1	14	1	30·6875			
" 26	13·3906	10	1	14	1	31·5937			
" 27	11·8867	10	1	14	1	31·3125			
" 28	12·2265	10	1	14	1	35·1562			
" 29	13·1484	10	1	14	1	33·3231			
" 30	14·2359	10	1	14	1	33·7500			
		Barley.							
" 31	12·6640	10	1	14	1·5	31·1718	12	89	No Change.
February 1	10·3359	10	1	14	1·5	30·1484			
" 2	8·6171	10	1	14	1·5	30·8281			
" 3	7·3984	10	1	14	1·5	28·0312			
" 4	13·3750	10	1	14	1·5	25·6406			
" 5	14·0507	10	1	14	1·5	28·1484			
" 6	8·6601	..	4	28	2	31·3125			
" 7	6·0937	..	4	28	2	15·1328	13	0	23 lbs. Increase.
" 8	8·1210	..	4	28	2	21·7031			
" 9	12·0546	..	4	28	2	26·8437			
" 10	10·7343	..	4	28	2	28·6875			
" 11	11·0976	..	4	28	2	22·4023			
" 12	14·6367	..	4	28	2	34·0859			
" 13	15·0000	..	4	32	2	30·1171			
" 14	11·6171	..	4	32	2	29·1718	12	71	41 lbs. Decrease.
" 15	13·1015	..	4	32	2	31·8437			
" 16	13·8750	..	4	32	2	33·9375			
" 17	12·6718	..	4	32	2	30·2500			
" 18	12·2812	..	4	32	2	28·5156			
" 19	12·0356	..	4	32	2	31·3437			
" 20	11·9531	..	4	32	2	32·2187	11	68·5	114·5 lbs. do.

[The object

The object of the experiments exhibited in the preceding tables was to ascertain the relative value of barley and malt when employed to fatten bullocks.

Two lean bullocks were procured, supposed pretty similar in their constitution; they were about three years of age each, the progeny of the same sire, though by different mothers. We shall distinguish them by the letters A and B. The weight of bullock A, 9 cwt. 7 lbs.; B, 10 cwt. 106 lbs.; so that B was 211 lbs. heavier than A.

They were both fed with the same food, both in kind and quantity; the only difference was that a certain number of pounds of barley were given to the one and the same weight of malt to the other. By some preliminary trials it was found that barley and malt alone could not be given as food; when it exceeded a certain quantity they began to loathe it, and left it unconsumed. We found hay indispensable. At first they got it *ad libitum*, the amount being ascertained before it was given the bullocks, and the residue uneaten carefully weighed, and its weight deducted from the original weight. It was soon found that the weight consumed very seldom exceeded 15 lbs. During a considerable part of the experiments that was the quantity actually given the bullocks. B eat more hay than bullock A; but bullock A eat a good deal of the straw employed for bedding, while bullock B never touched the straw. How much straw bullock A eat could not be ascertained, but it probably compensated for the inferior quantity of hay consumed by that bullock.

We began with 6 lbs. of barley to bullock A, and 6 lbs. of malt to bullock B, which was speedily raised to 9 lbs. and then to 12 lbs., beyond which we could not with safety go.

The hay consisted chiefly of the dried stalks and leaves of the Lollium perenne; sometime there was a mixture of clover. It was observed that the clover was always left untouched, while the lollium was eaten.

In the preliminary experiments made before the 1st of October, we tried how far the bullocks would relish the barley and malt if given entire, simply steeped in warm water; but we soon found that when taken in this state it was not capable of being digested by the bullock; they were, therefore, always ground into meal. In this state, when made into a mash with hot water, the malt was eaten with avidity, but the barley was not so much relished; however, on seasoning it with salt, it was taken, seemingly, with as much relish as the malt.

When barley is converted into malt, it loses, at an average, about a fifth of its weight; hence 5 lbs. of barley are equivalent to 4 lbs. of malt. In comparing the fattening powers of both, this proportion ought, in strict justice, to have been followed;

6 lbs. of barley ought to have been made to correspond with 4.8 lbs. malt. But we thought it better to take equal weights of both, in order to obviate any objection that might have been made to the fairness of the experiments.

The hay consumed by bullock A, from the 1st to the 15th October inclusive, was 312.7769 lbs., and that by bullock B. 311.75 lbs., or very nearly the same by each. Bullock A consumed 198 lbs. of barley, and bullock B the same weight of malt. I conclude that the relative fattening value will be proportioned to the increase of weight of the bullocks.

		Increase.	
		A.	B.
		lbs.	lbs.
From 1st to	4th October	3'	36'
— 4th to	8th —	83.5	26.
— 8th to	14th —	22.5	28.5
		—	—
		109	90.5

Here the bullock fed on barley increased in weight 109 lbs., while the bullock fed on malt increased 90½ lbs.

This shows a decided superiority of barley over malt when employed, weight for weight, for fattening bullocks.

Now this first fortnight is the portion of the experiment on which the greatest reliance is to be placed. A day or two after the 15th October the bullocks were attacked with a malady in the feet, accompanied by fever, at that time very prevalent in Glasgow, and fatal to not a few cattle. My attention was drawn to it on the 18th October, by finding that the weight of bullock B. had decreased by 18.5 lbs. On consulting a veterinary surgeon, he explained the nature of the disease. Bullock B was put under his care for a week, and bullock A was treated by him in our own cowhouse. By his advice the quantity of barley and malt was diminished to 8 lbs. per day, while no less than 56 lbs. of turnips were given daily. The turnips were boiled, and then mashed. Under this treatment the fever left the bullocks; and their feet, though not quite sound, were much better. But it was the 8th of November before we were in a condition to resume our experiments. At that time the weight of the bullocks was as follows:—

A, 9 cwt. 83 lbs., or 76 lbs. heavier than at first; B, 11 cwt. 36 lbs., or 6 lbs. heavier than at first. Bullock B had been much worse than A. Almost all the additional weight which it had gained was lost, while bullock A was still 76 lbs. the heavier, and of course had gained altogether 33 lbs., though it was not so heavy as it had been on the 15th October, before the malady began. Bullock A had not been so much affected as bullock B, and recovered more speedily.

Let us now observe what took place between the 8th of November, when the experiments were renewed, and the 22nd November. The food of bullock A was hay, barley, turnips; and that of bullock B, hay, malt, and turnips.

Food of bullock A.		Bullock B.	
	lbs.		lbs.
Hay-	148·8	171·34	
Barley	120·	120·	Malt.
Turnips	840·	840·	
	<hr/>	<hr/>	
	1108·8	1131·34	

The quantity of turnips may appear large, but turnips contain very little solid matter. 100 parts, dried at 212° till they cease to lose weight, are reduced to 9·214 parts; showing that almost nine-tenths of turnips is water.

The following table shows the increase of weight of the bullocks under this diet:—

	A.	B.
	lbs.	lbs.
From 8th to 12th Novemb.	21	16
— 12th to 15th	18	6
— 15th to 22nd	16	22
	<hr/>	<hr/>
	55	44

Here we see the same superiority of barley over malt.

During the next eleven days the barley and malt given to each bullock was increased to 11 lbs. Here the effect of too much barley on the bullock was very evident. Bullock A refused to take it at last. The malt was eaten by bullock B with more relish.

Note.—Perhaps the diseased state of the turnips, to be noticed afterwards, may have occasioned the illness of bullock A.

The deranged state of the digestive organ of bullock A will appear if we compare the food consumed by each bullock during these eleven days.

		A.	B.
		lbs.	lbs.
Hay-	-	119·41	138·74
Barley	-	112·	112·
Turnips	-	616·	616·
		<hr/>	<hr/>
		847·41	866·74

The hay consumed by A was nearly 20 lbs. less, or about one-sixth less than by B. The weight of the animals was thus:—

	A.	B.
	lbs.	lbs.
From 23d to 26th Nov.	- 17 increase	- 2 increase
From 26th to 3d Dec.	- 5 decrease	- 44 increase
	<hr/>	<hr/>
	12 increase	- 46 increase

Here there was a diminution in the weight, from the 26th November to 3rd December, amounting to 5 lbs. This, as well as the diminution of hay, shows the deranged state of the stomach. The quantity of dung, as will appear by inspecting the table, was considerably altered.

Suspecting that the turnips, many of which were infected with the disease which has destroyed so many potatoes during the present season, might have disagreed with bullock A, they were reduced to 28 lbs. per day, given four times a day, or 7 lbs. at each meal. The hay, barley, and malt were the same as before. From the 4th to the 20th December the amount was:—

		A.	B.
		lbs.	lbs.
Hay-	-	176·39	226·08
Barley	-	204·	204·
Turnips	-	476·	476·
		<hr/>	<hr/>
		856·39	906·08

Here the hay consumed by B exceeds that of A by about 50 lbs.

The effect upon the weight of the cattle by this food was as follows:—

	A.	B.
	lbs.	lbs.
From 4th to 6th Dec.	- 7 increase	48 decrease
— 6th to 10th	— 27 increase	52 increase
— 10th to 13th	— 17 decrease	2 increase
— 13th to 20th	— 23 increase	
	<hr/>	<hr/>
Total increase	- 40	6

Here, as in the former cases, the increase of weight from the barley was much greater than from the malt. The diminution of weight of B on the 6th December, and that of A on the 13th, we cannot explain. Both bullocks appeared in good health, except that A consumed a much smaller quantity of hay than usual.

Finding anomalies which might be suspected to be connected with the diseased turnips, they were omitted altogether, and 3 lbs. of linseed oil cake given each day as an equivalent; at the same time the malt and barley were reduced, first to 8 lbs., and then to 10 lbs. per day.

The food from the 29th December to the 16th January was as follows:—

		A.	B.
		lbs.	lbs.
Hay	-	207·52	249·357
Barley	-	180·	180·
Oil cake	-	54·5	54·5
		<hr/>	<hr/>
		442·	483·8

In this case the hay consumed by bullock B exceeded that by A by almost 42 lbs.

The increase of weight was as follows:—

	A.	B.
	lbs.	lbs.
From 29th Dec. to 29th Jan.	- 44 increase	28
— 3d Jan. to 10th	— 1 decrease	25
— 10th — to 17th	— 3 decrease	25
	<hr/>	<hr/>
	40	78

In this case there was a falling off on the part of A, from 3rd January to 17th January, amounting to 4 lbs.; yet the food was taken readily, and bullock B regularly increased in weight.

These trials, continued for three months, leave no doubt that barley is superior to malt, weight for weight, as far as fattening bullocks is concerned.

We thought it worth while now to try whether any difference would be perceptible if each bullock was fed for a week with barley, and then malt substituted, the other articles of food remaining unchanged.

Bullock A was fed for a week (from 17th to 23rd January) on the following articles of food:—

	lbs.
Hay - - - - -	73·8746
Malt - - - - -	70·
Oil cake- - - - -	6·75
Good turnips - - - - -	98·
Bean meal - - - - -	6·75
	<hr/>
	255·37

The food of B during the same time was—

	lbs.
Hay - - - - -	92·79
Barley - - - - -	70·
Oil cake- - - - -	6·75
Good turnips - - - - -	98·
Bean meal - - - - -	6·75
	<hr/>
	274·29

The result was—

	lbs.
A increased in weight - - -	9
B increased in weight - - -	0

The trial was repeated, A getting malt, and B barley—

A increased in weight - - -	4
B increased in weight - - -	23

Here the barley was found superior to malt. In the first trial there was a slight superiority in the malt.

The increase of weight after a week's feeding was now so small that I became sensible that the

fattening process could not be carried farther in a cowhouse; and neither the season of the year nor the nature of the experiments made it possible to give them the superior influence of a grass field. On consulting several experienced cow-feeders and butchers they assured me that the bullocks were in very good condition, and that I could not increase their weight much farther.

Oilcake and bean meal having been much vaunted by them for its superiority to everything else for fattening bullocks, I thought it worth while to devote another fortnight to try the value of this.

The experiments from 6th February to 20th February were made with this view. The result will be seen by inspecting the table at the head of this report.

Bullock A.

	lbs.
First week increased - - -	7·5
Second week increased- - -	4·5
	<hr/>
	12·

Bullock B.

	lbs.
First week decreased- - -	41·
Second week decreased - - -	114·5
	<hr/>
	155·5

The great diminution in the weight of B, and the small increase of A, during these two weeks, seem to show that oil cake and bean meal are not superior in fattening power to barley and malt.

These experiments, though interrupted and rendered more difficult by the malady of the bullocks, leave no doubt that barley is superior to malt in fattening cattle. This conclusion corresponds with those deduced in the following report from the effect of barley and malt, upon the quantity of milk yielded by cows fed on each. THOMAS THOMSON.

EXPERIMENTS TO DETERMINE THE EFFECT OF BARLEY AND MALT ON THE MILK OF COWS.

Summary, including some practical conclusions.

I.—QUANTITY OF MILK PRODUCED BY DIFFERENT KINDS OF FOOD.

[It will be observed that reference is made in several places to tables, for them we must refer our readers to the Report itself, as they are too voluminous to enable us to give them.—ED. F. MAG.]

In making inquiries respecting the amount of milk afforded by cows, we cannot fail to be struck with the vague and imperfect manner in which the attention of agriculturists is directed to weighing and measuring; thus, for example, in Scotland, where milk is generally reckoned by the Scottish

pint, when this measure is compared with the English system there is almost uniformly an error made in over-estimating its capacity. The usual allowance is four English to one Scottish pint; but the true relation between these measures is much inferior to this—the English or imperial pint having a capacity of 34.659 cubic inches, and the Scottish pint of 103.4 cubic inches, a Scottish pint is very nearly equal to three English pints. When measurements have been made according to the Scottish system, a certain degree of caution

DR. R. D. THOMSON'S REPORT

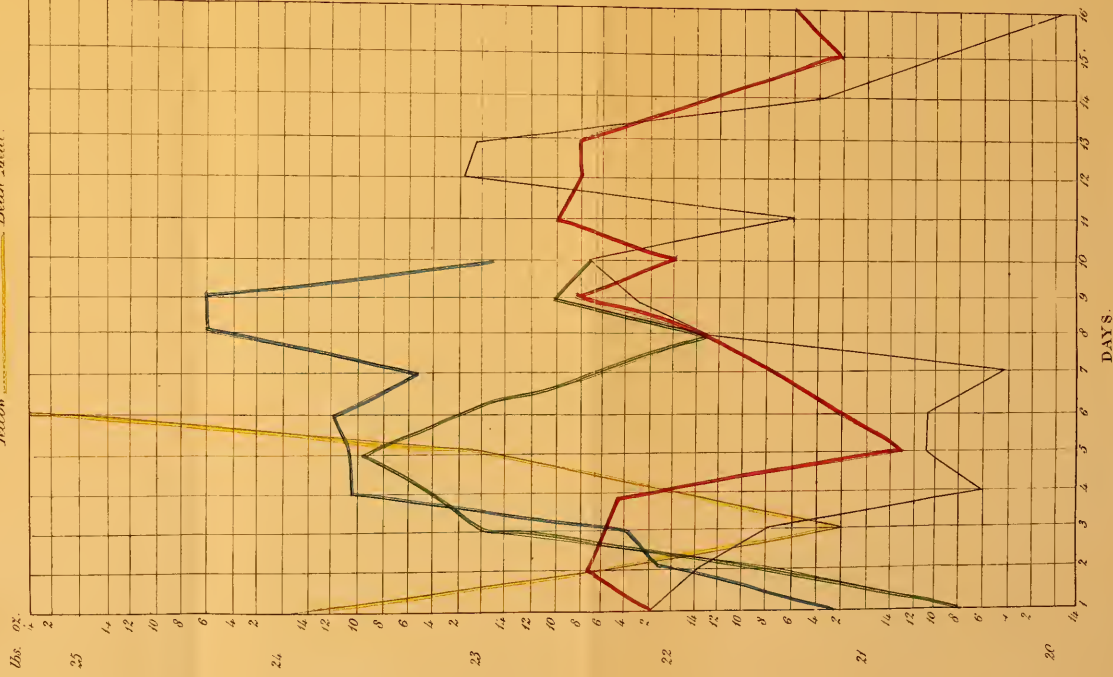
on the relative value of

BARLEY, MALT, MOLASSES, LINSEED AND BEAN MEAL AS FOOD FOR COWS.

Diagram Exhibiting in Pounds and Ounces the amount of Milk produced by the white Cow daily by Five different kinds of food.

The Black line represents the Malt.

Red ————— Barley
Green ————— Barley and Molasses
Blue ————— Barley and Linseed
Yellow ————— Bean Meal



These trials, continued no doubt that barley is for weight, as far as fatter

We thought it worth v any difference would be p was fed for a week with b stituted, the other article changed.

Bullock A was fed for 23rd January) on the foll

Hay	-	-	-
Malt	-	-	-
Oil cake-	-	-	-
Good turnips	-	-	-
Bean meal	-	-	-

The food of B during t

Hay	-	-	-
Barley	-	-	-
Oil cake-	-	-	-
Good turnips	-	-	-
Bean meal	-	-	-

The result was—

A increased in w

B increased in w

The trial was repeated, barley—

A increased in w

B increased in w

Here the barley was fou the first trial there was e malt.

The increase of weigh was now so small that I l

EXPERIMENTS

I.—QUANTI

[It will be observed th several places to table our readers to the Rep voluminous to enable t MAG.]

In making inquiries re milk afforded by cows, w with the vague and imperf attention of agriculturists and measuring; thus, fo where milk is generally re

must be exercised in converting them to the English standard. Now, as in Scotland the actual measurements are generally made with the Scottish pints, when the amount of milk is stated in English pints we may almost safely conclude that the estimate has been greatly overdrawn; but, even taking these sources of error into consideration, it is very remarkable how great a difference exists in the amount of milk given by cows under similar circumstances. No one will be surprised at the Alderney cow of Mrs. Tabitha Bramble* affording a daily supply of 4 gallons of milk, or 32 pints, when we read, in more recent times, of a short-horn giving 17 Scottish pints (51 imperial pints), or 64½ lbs., at 10¼ lbs. to a gallon, and of a roan cow yielding 30 Scottish pints (90 imperial pints), or 115½ lbs., and requiring to be milked five times a day, so that at each milking 2¼ gallons must have been extracted from the animal†, an average allowance for one cow during the whole day. All these statements must be understood as referring to cows which are allowed to graze at least during the day, and must be viewed as extraordinary cases. A nearer approach to an average will be obtained by directing attention to the produce of an Ayrshire cow fed in Berwickshire, which yielded, during July 1845, 6½ Scottish pints (19½ imperial pints,) 25 lbs., or to an Alderney cow in Lancashire, which supplied an average amount, in June 1845, of 20 imperial pints=25½ lbs.; but even in such instances, which are taken from Lowland pasture grounds, the quantity often exceeds this by several pints, and sometimes also falls below it to the same extent, without any very apparent cause. In moorland pastures the average amount of milk is, however, much inferior to what has been stated. In one locality in the neighbourhood of Glasgow, where many cows are kept, the supply from each animal does not average more than from 12 (15½ lbs.) to 14 (18 lbs.) imperial pints per day, and in another moorland farm the amount varies from 10 (12¾ lbs.) to 15 (19 lbs.) imperial pints. With a statement of these data for comparison we are enabled to form an idea of the influence exercised in the experiments detailed. When the cows were at pasture in Ayrshire they yielded 20 imperial pints each per day (25½ lbs.); then they were in full exercise, and without any restriction in the amount of their food. They might in these circumstances be represented as in a state of nature, and without any of the artificial conditions which must always, to a certain ex-

tent, interfere with the animal processes. An animal enjoying exercise must also consume a larger amount of food than one shut up, or, in other words, it must convey into the system a greater quantity of material for producing milk than an animal in a state of confinement.

(1.) *Effect of Grass on Milk*

For seven days after coming to Glasgow, where they were confined in a roomy and airy cowhouse, and fed on cut grass, the red cow (the less symmetrical of the two animals) gave a larger amount of milk than when at pasture; the greatest quantity of milk during the week being 27¾ lbs., and the smallest amount being 24¾ lbs., the mean being 26½ lbs.; there was, therefore, in this case a decided increase in the amount of milk. With the other cow the result was quite different: the quantity of milk appears to have diminished immediately with the confinement; the mean of the first seven days being 22¾ lbs. It is difficult to account for the great difference in the result of the produce of the two animals upon any other supposition than that the constitution of the one admitted of confinement with less detriment to its system than the other. The causes which have been previously alluded to when treating of the characters of the animals may, probably, also supply a solution to these apparent anomalies. But we deduce the important inference from these facts, that no correct generalization can be arrived at from an isolated example. During the seven remaining days of the experiment the quantity of milk fell off with both cows; that of the brown cow subsiding from a mean of 26½ to 22½ lbs., and that of the white cow from 22¾ lbs. to 20½ lbs. There was, altogether, a difference in the daily amount of milk, from the beginning to the end of the fortnight, in the case of the brown cow of 4 lbs., and in the white cow of 2 lbs., although the amount of food continued the same throughout.

(2.) *Effect of Variety of Food on Milk.*

The considerable falling-off depended undoubtedly in some measure upon the confinement to which the animals were subjected, although, on examining the tables, it will be found to be a pretty uniform result, that a change of food produces an increase in the quantity of milk, and that after the same diet has been continued for some days, the milk begins to diminish in amount. There are several exceptions in the tables, some of which, however, admit of simple explanation. In the second experiment, which was made with entire barley steeped, the quantity of milk decreased very rapidly. In the case of the brown cow there was a difference between the milk of the first and last day of the experiment of 5 lbs., and in the white cow of 2½ lbs.

* "I am astonished that Dr. Lewis should take upon himself to give away Alderney without my privacy and concurrences. Alderney gave four gallons a day ever since the calf was sent to market."—Humphrey Clinker.

† Stephen's Book of the Farm, iii. 1275.

This arose from a quantity of the barley being ejected by the animals without being digested. Entire malt being given raised the amount of milk immediately; and the quantity continued to rise daily till it amounted, at the end of the trial, in the case of the brown cow to an increment of the last over the first day's milk of 3 lbs., and in the white cow of 4 lbs. We can see at once why there was an improvement under the malt regimen, from the circumstance that, being much more soluble than the barley, it was not ejected by the animals; indeed, none of it was observable in the dung, while a large proportion of barley was always carried to the dung-heap. The second and third experiments do not serve to prove any point in reference to the dietary of animals, but they may be useful as evidence to show that the more soluble the food is, the greater is the amount of milk produced. In the fourth experiment, with crushed barley, the brown cow's milk decreased $1\frac{1}{2}$ lbs. in sixteen days, and the white cow's 10 oz., or considerably more than half a pound, in the same period. In the fifth experiment, with crushed malt, the brown cow's milk declined $2\frac{1}{2}$ lbs. in sixteen days, and the white cow's upwards of $2\frac{1}{2}$ lbs. In the sixth experiment, with a larger quantity of crushed barley, the brown cow's milk continued to increase up to the fourth day, and then began to decline; a similar result attended that of the white cow. In the seventh experiment, with molasses and barley, the brown cow's milk reached its acme or culminating point on the second day of the trial, and it then continued to decline till the close of the experiment on the tenth day. With the white cow, the greatest amount of milk was afforded on the fifth day, when it began to decline, and gradually diminished till the termination of the trial. In the eighth experiment, made with barley and linseed, the amount of milk continued to increase for a longer period than usual; the largest quantity given by the brown cow was on the ninth day, and by the white on the eighth and ninth days. With the bean meal, in the ninth experiment, the milk continued to increase up to the fifth day, when the trial closed.* That a change of diet is necessary for animals which are kept in a confined condition is proved by the tables accompanying this report in a striking manner, and the results now obtained amply sustain the idea supported by us some time ago in reference to the dietary of human beings shut up in poorhouses and places of confinement. It was then argued, that, "in order to retain the human constitution in a healthy condition, variety of food should be properly attended to,"† and different species of diet

were suggested, as well calculated to supply a series of dishes to the poor. In the Asylum for the Houseless, and in the House of Refuge at Glasgow, these recommendations were followed out, and, according to the report of the treasurer, the dinner meals being varied two or three times every week, "the change in the dietary routine is much relished by the inmates, and may have had some effect in the greater degree of health which has been evident among them of late."* The analogy subsisting between the physical nature of human beings and of many of our domestic animals would lead us to the conclusion upon physiological grounds that their dietary should be conducted upon precisely similar principles. To prove this by exact experiments is a point, it will be admitted, of considerable importance to the agriculturist, although it may have been, as might be expected, surmised by many intelligent observers. Not only, however, is *variety* of food requisite for an animal in an artificial state; it is found also to be beneficial to one in a condition more akin to that of nature. For it is upon this principle that we are able to account for the superior influence of old natural pastures, which consist of a variety of grasses and other plants, over those pastures which are formed of only one grass, in the production of fat cattle and good milk cows. To any one who considers with attention the experiments which have been detailed, there cannot remain a doubt in the mind that cattle, and especially milk cows, in a state of confinement, would be benefited by a very frequent and entire change in their food. It might not be too much to say that a daily modification in the dietary of such animals would be a sound scientific prescription.

(3). *Effect of Barley and Malt on Milk.*

In considering the influence of barley and malt on the production of milk, it is obvious that experiments II. and III. offer no data from which conclusions can be drawn, except to point out the useful practical fact that grain should never be given to cows in an entire state, but that it should always be ground or crushed, and then steeped before being presented to them. If we compare experiments IV. V., we find that in sixteen days 141 lbs. of crushed barley steeped produced in the brown cow 342 lbs. of milk, and in the white 351 lbs. of milk, and that both animals gained in weight; while again 168 lbs. of malt produced in the brown cow 310 lbs. of milk, and in the white 345 lbs. of milk, during sixteen days; the former cow gaining some weight, and the latter losing a little. The quantity of malt exceeded that of the barley by 27 lbs., and yet the brown cow gave 32 lbs. less of

* See diagram, miscellaneous table 4.

† Proceedings of the Philosophical Society of Glasgow, vol. i. p. 99.

* Proceedings of the Philosophical Society of Glasgow vol. i. p. 40.

milk with malt than with barley, and the white cow only 6 lbs. less milk; hence in the brown cow 100 lbs. of barley produced as much effect as 131 lbs. of malt, and in the white cow 100 lbs. of barley were equivalent to 119 lbs. of malt. Now, as 100 parts of barley, when malted, become 80 of malt, it is obvious that 100 of barley are equal in value to 125 of malt, for $80 : 100 :: 100 : 125$. If we take the mean of the result of the preceding experiment, we find that 100 of barley goes as far in producing milk as 125 of malt, $119 + 131 \div 2 = 125$. Again, by a mean of three experiments, the amount of nitrogen in malt was found to be 1.52 per cent., and that of barley 1.96 per cent. by four experiments, which would make 100 parts of barley equivalent to 128 of malt in nutritive power. These are all remarkable coincidences of theory and practice, and cannot fail to convince us that the proportions stated are very close approximations to the nutritive equivalents of barley and malt, or, in other words, that malt is about one fifth inferior to barley in its nutritive effects. In considering the sixth experiment, which was made for the purpose of comparing the effect of a large quantity of barley with a large amount of malt, it will be observed, that the experiment commenced when the amount of milk was declining under the malt regimen, but that as soon as the barley was given the milk began to increase in both cows. The weather, however, at this time became much warmer than it had hitherto been. The mean temperature, as exhibited in the table, became more elevated; but the numbers in the tables will scarcely give an idea of the stagnant sultry nature of the atmosphere in the cowhouse, in the immediate neighbourhood of which in a room without a fire, the thermometer during the five days stood at 66° , and at one period of the thirtieth, or first day of the experiment, rose to 70° . The cattle were during this period very much troubled with flies, which produced, as all agriculturists will understand, much agitation, and constant movement. These circumstances are calculated to explain the loss of weight sustained by the brown cow, and it accounts for the fact that the increase of milk was not so rapid as in the previous barley experiment. This experiment may be viewed as an interesting example of the influence which atmospherical causes exercise upon the production of milk, and exhibits a result perfectly in accordance with the experience of good agricultural observers. From the circumstances mentioned it is obvious that this experiment should not be taken apart from the previous barley trial, since the conditions were somewhat different under which it was made; but we have employed it along with the other trial in striking an average, as in miscellaneous table No. 3, and in

calculating the deductions from experiments IV., V., and VI.

(4). *Effect of Molasses, Linseed, and Beans, in the Production of Milk.*

If we examine the Miscellaneous table No. 3, we find the mean quantity of milk afforded by the brown cow, every five days under different regimen, was as follows:—barley, 107 lbs; malt, 97; barley and molasses, 101; barley and linseed, $102\frac{1}{2}$; beans, $99\frac{3}{4}$. And by the white cow the mean quantities respectively were, every five days—barley, 109 lbs.; malt, $108\frac{3}{4}$; barley and molasses, $112\frac{1}{2}$; barley and linseed, $115\frac{1}{2}$; beans, 115 6-10ths. Of all these articles of food, in both cases, malt gives the smallest produce. Then comes, with the white cow, barley and the other articles increase in effect as they stand above, bean meal affording the greatest amount of produce. It will be observed, in examining the bean meal table, that the milk increased up to the termination of the experiment; and that in the case of the white cow, the quantity yielded exceeded that supplied by this animal on any previous occasion, except in one solitary instance under the grass diet. The quantity of milk given by the white cow on the 18th September, under the bean regimen, amounted nearly to $25\frac{1}{2}$ lbs., thus approaching closely to that afforded by both cows when they were at pasture three months previously. This cannot fail to be admitted as an interesting fact, and is strongly corroborative of the propriety of the partiality of cow-feeders for bean meal as an article of nutrition for their stall-fed cattle. If we take a mean of the produce of the two cows, as previously stated we shall find the relative influence of each in the production of milk to be as follows:—Commencing with that which possesses the lowest nutritive power, malt produces 102.66 lbs. of milk, barley and molasses, 106 $\frac{3}{4}$; bean meal, 107.68; barley, 108; barley and linseed, 109. We think it better to state the mean produce of the two cows, because it will afford an average of what we might expect to meet with in feeding a number of cattle with these various articles of food. A comparison of the experiments on the two cows, however, fully demonstrates that one kind of food will produce a greater influence on one animal than on another; and that, as with human beings, probably, attention should be bestowed on what is agreeable to each individual animal, both in reference to its palate and constitution. For it should be always borne in mind that stall-fed animals are not in a natural condition, and that being placed under artificial restrictions, a due consideration of the adequate means of counterbalancing the adverse circumstances of their condition can alone conduce to a true theory of humane stall-feeding.

(5). *Influence of Quantity of Grain in the Production of Milk.*

To ascertain the amount of grain best calculated to afford the largest supply of milk is a practical point of no small importance to the cow-feeder. Perhaps from miscellaneous table No. 3, the best solution to this question may be obtained, in reference to the articles of food employed in the present series of experiments. In the barley experiment it will be observed, that when 12 lbs. of barley were given daily the amount of milk was inferior, in both cows, to that obtained when 9 lbs. was the diurnal allowance. This result seems so decided, in both series of experiments, that it may almost be considered as established, that no adequate advantage appears to be attained by pushing the supply of barley to a cow beyond the extent of 9 lbs. daily. An increase in the quantity of malt appears sometimes to increase the quantity of milk; but in general, the same deduction may be made with reference to malt as to barley, that in a remunerative point of view, 9 lbs. a day may be considered a large proportion of malt to supply to a cow. It is highly probable, indeed, that a smaller amount, especially if the animals were allowed a certain limited degree of exercise, would be found fully as efficient as a larger quantity. We have, in the body of the report, endeavoured to explain this upon the physiological principles of digestion, and to show, that, as ruminating animals more especially are possessed of great capacity of stomach, an excess of concentrated food by failing to effect adequately the purpose which bulky food accomplishes—of exciting the coats of the stomach to secrete their digesting fluid—will tend rather to diminish than to increase the result which we desire to gain.

(6). *Rate at which Food is changed into Milk.*

As a variety of views prevail with regard to the period required by the animal system for the conversion of food into milk, perhaps the first series of these tables will assist us in forming more precise notions upon this curious physiological question. An inspection of these tables shows us that the largest amount of milk is supplied by stall-fed cows in the morning. Now as comparatively a small amount of food is consumed during the night, it is obvious that this superior amount of milk must be derived from the previous day's fodder. An observation which was frequently made, viz., that undigested food did not appear in the dung till sixteen hours after being swallowed, would tend to demonstrate that, during this period at least, absorption of the nutritive part of the food was going on; since we know that along the whole course of the intestinal canal the soluble food continues to be taken up through the coats of the viscera.

II.—RELATIVE INFLUENCE OF DIFFERENT KINDS OF FOOD IN THE PRODUCTION OF BUTTER.

In the miscellaneous table No. 3. we have collected the amount of butter produced by five kinds of food during periods of five days each. But pre-

vious to these trials, thus arranged, the largest quantity given by the brown cow was under the grass regimen. The first five days of the experiment yielded 4.93 lbs. of butter, after which the quantity diminished to the last five days of the trial, when the quantity yielded amounted to 3.75 lbs., a proportion not superior to what was produced in some of the subsequent experiments. The same law does not appear to hold with reference to the diminution of the butter as pertains to that of the milk, when the food has been continued for some time. We find, on the contrary, frequently the amount increasing towards the close of the experiment, even when it is continued for ten or fifteen days. The largest amount of butter was afforded in the brown cow by crushed barley. During the third series of five days the amount was 3.935 lbs.; bean meal gave the next greatest quantity, 3.69 lbs. in five days; then comes barley and linseed, 3.689 lbs. during the first five days; barley and molasses 3.63 lbs., and malt 3.60 lbs. In the case of the white cow the quantity was, beans, 3.76; barley and linseed 3.421; crushed barley, 3.376; barley and molasses, 3.26; and malt, 3.126. With both animals we observe that malt is lowest in the scale, a fact which seems in some measure to militate against the idea of the origin of the butter being in the sugar of the food. Be this as it may, however, although there are many counter arguments in favour of the opinion that sugar affords such a supply, we think the tables Nos. 1 and 2 (miscellaneous) tend to show that there is no relation between the butter of the milk and the wax and oil of the food, since frequently, when the oleaginous matter of the food is small, the butter is more considerable than on other occasions when the reverse happens. Since then the facts contained in the tables, and the arguments used in the body of the report, seem to prove that the butter cannot be supplied from the oil of the food, it becomes an interesting point for the agriculturist to learn from what element of the food it proceeds. It may safely be inferred that it must be formed from some other constituent of the diet by means of the vascular system, either as a primary or secondary stage. Sugar affords the most simple element from which it may be produced, because we now understand how the acid of butter can originate from sugar; but even the albuminous principles might afford butter. Upon these grounds, then, we can infer that a certain degree of exercise would be more conducive to the production of fat than if the animal is allowed to remain at rest; because, as the source of the fat or butter is dependent on the process of respiration, it is obvious that the more the function is encouraged within moderate bounds the greater the amount of oil-giving principle of the food will be taken into the system and converted into fat. We believe that this theoretical deduction is perfectly in consonance with the experience of good observers, who find that box or hammel feeding is more conducive to the health of cattle and cows destined for the butcher, or for the production of butter, than close plant-like confinement, which is foreign to the nature of every animal, and at variance with the first principles of physiological science.

ROBERT D. THOMSON.

Glasgow, 20th December, 1845.

THE BIRCH TREE.

Little as this tree is thought of by foresters or planters in general, it possesses some qualities which give it peculiar interest, and these I shall endeavour to point out, after taking a cursory view of its botanical position.

In the Linnæan system we find it in the twenty-first class, *Monœcia*, wherein the male and female flowers are distinct from each other, but upon the same tree; and in the fourth order, *Tetrandria*, the stamens being four. In the natural system it now is placed among the *Amentaceæ*, that is, with the flowers in catkins; and in the second suborder as the type of the birch and alder tribe.

According to Loudon's Encyclopædia of Plants, the genus *Betula*, or birch, comprises—two species (white, or common birch, and “the lady,” or weeping birch), natives of the woods of England; one, the smooth dwarf, native of Scotland; six others, natives of North America, tall growers, attaining fifty to seventy feet, one of them, *B. papyracea*, being the celebrated paper birch, the tree of which the Indians construct their canoes, and some smaller articles, such as sugar-baskets for the table, &c.; and four or five, of inferior stature, natives of Germany and Northern Europe.

1. The common birch is disposed to grow on poor, sandy soil; though it does not reject that of richer quality.

2. The pendulous, or “weeping” birch is the ornamental tree of the European species: its slender, graceful, dropping branches and spray eminently qualify it to occupy a conspicuous situation on the lawn, or upon some conveniently-situated knoll. Its young wood is smooth, brown, and dotted with pearly specks. The leaves are ovate, saw-cut (*serrate*), acute, but not taperingly pointed, rather hairy; the catkins pendulous.

Gilpin, in his “Forest Scenery,” describes, in the picturesque language so peculiarly his own, this graceful tree: “Of the white birch there is a very beautiful variety, sometimes called the “lady birch,” or the “weeping birch.” Its spray being slenderer and longer than that of the common sort, forms an elegant, pensile foliage, like the weeping willow; and, like it, is put in motion by the least breath of air. When agitated, it is well adapted to characterize a storm, or to perform any office in

landscape which is expected from the weeping willow” (p. 70, edit. 1808).

There is one circumstance which has been remarked by observant persons, that must claim particular attention: it is said that the tree known as the birch in parts of Scotland is peculiarly fragrant; and the question has been asked, whether the species commonly cultivated in England possess any such odour. I have sought in vain to ascertain the precise state of the case; and, referring to several authorities, I find no notice of the circumstance, excepting in the short note appended to the genus in Loudon's Encyclopædia of Plants, page 780, on the species *Lenta*, the soft or hornbeam-leaved birch: “The leaves, which appear early in spring, possess a peculiar fragrance, which they retain after being dried in a stove; affording, by infusion, an agreeable diluent, superior to some of the teas of commerce.”

By the above extract it should appear that fragrance is attached solely to *Betula lenta*. Yet if so, why should this quality be restricted to the beeches grown in Scotland, and so far north there as Aberdeenshire, while we in England remain in comparative ignorance of so valuable a property? But again, is the species *Lenta* known in Scotland? and on this point we obtain no satisfactory information; for, in referring to a comprehensive account of the genus *Birch*, and its most noted species, by an eminent botanist, there is no mention whatever made of perfume or fragrance. The qualities ascribed to *Lenta* are, however, so interesting, that I cite the following passage, with a view to recommend the tree to planters in general:—

“*Betula lenta*, the soft, black, or cherry birch. —None of the American birches produce timber so valuable as this; whence, one of its American names is, “mountain mahogany.” Its wood is hard, close-grained, and of a reddish-brown. It is imported into this country in considerable quantity under the name of “American birch,” for forming the slides of dining-tables, and for similar purposes. It is abundant in the midland States, as in New York, New Jersey, and Pennsylvania; but more to the south it only appears on the summits of the Alleghanies. Deep, rich soil is what it prefers. And when it attains its greatest dimensions, which are as much as seventy feet of height and three of diameter, it is a handsome tree, budding remark-

ably early in the spring, when its leaves are covered with a short, thick coat of down; this disappears later in the season, and leaves them of a bright and lively green. Michaux says that it grows with unusual rapidity; and mentions an instance of a plant which, in nineteen years, grew to the height of forty-five feet eight inches. *It is rarely seen in this country*, although it is, perhaps, one of the best suited to our climate. The thinness of its leaves, combined with their oblong figure, distinguishes this from all the other species."

If, then, it be true that fragrance is attached to *B. lenta* only, the cultivators of Scotland, who all agree that they possess the odoriferous birch, ought to ascertain the exact state of the case; for, combining superior excellence of time with fragrance, they might esteem themselves very fortunate.

Since I commenced this little article I have had an opportunity to consult a Scotchman, but could obtain only the general information that fragrance was a concomitant of the birches grown in Scotland; and it was taken for granted that, *everywhere* when dews or light rain moistened the young foliage, the odour might be perceived. Here, instead of

being enlightened, we find ourselves still more perplexed; and must be content to go on inquiring and observing till we meet with a tree which *does* possess fragrance, or with a person who can vouch the fact.

In the mean time, as birch-trees are not much honoured (save and except, perhaps, by sundry erring neophytes), it would be worth while for some spirited gentleman to introduce the American "mountain mahogany," *B. lenta*; and thus we should acquire a beautiful tree, possessing superior qualities—*fragrance* among the rest—large in stature when fully grown, ornamental in every stage of its progress, and very useful as a timber tree.

My own experience and observation being limited, and the living authorities I am acquainted with being few, I may possibly have said too much on the quality of odour. Still, however, I may be held excused, by those who know the exact state of the case, for endeavouring to introduce a species of the birch which cannot fail to improve our forests and to decorate the park and pleasure-grounds when judiciously introduced with a view to the

J. TOWERS.

ON SUPERPHOSPHATE OF LIME.

BY PH. PUSEY, M.P.

Dr. Liebig's great discovery of dissolving bones in sulphuric acid for the purposes of manure, has been so clearly established by the experiments as well of the duke of Richmond as of other farmers, and so fully investigated by Mr. Hannam, that nothing seems now to be wanted but some plan for bringing it within the ordinary routine of farming. Though the mixtures hitherto prepared have answered perfectly, they have mostly been supplied to the turnip crop in the shape of liquid manure. This mode, however, requires either tedious labour by hand, or an expensive water-cart made for the purpose; and in neither way would be adapted, I think, to the hurry which generally accompanies turnip-sowing on a large farm, where on a favourable turn of weather a hundred acres perhaps require to be finished while the soil retains the suitable temper.

It is to the drill, therefore, I have always thought we must look for this object; but before stating the simple plan of mixing and drilling which has answered with me in practice, I will venture to say a few words on the theory of Dr. Liebig's discovery.

Bones, it is well known, have been long used in England for the turnip crop; still though their success on some soils was certain, the cause of that success was by no means so clear; for fresh bones are made up of oil, of jelly, or gelantine, and of phosphorus united with lime. But when the oil, was boiled out of the bones they still acted, and when the jelly was burnt out of them they still acted even more rapidly; so that without at all saying that either the oil did nothing, or the jelly did nothing, it became clear that the peculiar active principle of bones is the phosphorus combined with lime; and, as the quantity of lime is insignificant, that it is the phosphorus—a pale substance like wax, which has the singular property of giving a faint blue light when in the dark. This curious substance, it appears, which may be bought for a few pence at any chemist's, is one of the main elements with which nature works in compounding seeds and roots serving for the food of man and of beast.

In bones, however, the phosphorus, in an acid state, is compounded with lime in such a propor-

tion as to form a salt called phosphate of lime, which water does not dissolve, and which therefore acts slowly upon the roots of crops to which it is applied as manure. Dr. Liebig knew that oil of vitriol (*sulphuric acid*), if mixed with bones, would take to itself a part of this lime, leaving behind a new salt containing at least a double portion of phosphorus, and therefore called *superphosphate of lime*, which salt being readily dissolved by water, he hoped would afford a more digestible food for the young turnip, and the result has answered his expectations. Such is the simple history of this great discovery.

Hitherto, as I said, the mixture has been applied as a liquid manure, diffused sometimes in fifty times its bulk of water; and it has been prepared in vessels troublesome to procure and liable to be injured by the acid. Availing myself, however, of a suggestion for dispensing even with these, I formed a flat heap of dry mould about ten feet across, the surface of which was scooped into a hollow basin, capable of holding 20 bushels of ground fresh bones. A little water was poured on, but I have since omitted the water. Sulphuric acid, to the amount of about half the weight of the bones, was gradually poured into this basin. They soon began to heat, seething violently, and sending out a great deal of steam, with a peculiarly offensive stench; presently the whole mixture wears the appearance of boiling blood, and swells so much from the escape of gas, that the workmen stirring it with their hoes must take great care to prevent it from bursting over the sides of the earthen basin. In a short time, however, the cauldron becomes quiet, and the bones disappear altogether, except a few fragments; so that the heap may be shovelled together, and might be drilled on the same day, but this would not be advisable, as some small lumps still half liquid remain in the compost. On the first occasion the earth and dissolved bones were left mixed together, and though perfectly cool when so left, I learned, on returning, after six weeks' absence, that a second heating had soon taken place, and found that the heap was hot still. The offensive smell was gone, and was replaced by the musky odour of rotten dung. I mention this circumstance because I am anxious to draw to it the attention of chemists. This second fermentation may be that of the animal matter contained in the bones, and may bring out its ammonia: if so, it will be a question whether it be desirable thus to give time for the formation of ammonia before the manure is applied; or whether it be better to drill the compost at once, allowing the ammonia to be produced under ground, and so be supplied to the young plant more gradually.

The compost thus made was tried in July, on

some light land very much exhausted, and naturally unkind for the growth of turnips. The trial ground was about 2 acres. On one part the compost of bones and acid was drilled at the rate of $4\frac{1}{2}$ bushels of bones to the acre; on another part, bones at the rate of 20 bushels an acre; and I added, on a third part, a manure (purchased from Mr. Fothergill, under the name of superphosphate of lime) at the rate of 2 cwt.

The bones and acid took the lead of the bones, and kept it throughout. I am bound to add that the superphosphate prepared by Mr. Fothergill not only surpassed the bones, but also that which I had manufactured myself. Possibly the quantity of Mr. Fothergill's may have been too large for comparison; but though I think my own method of preparing superphosphate a convenient one, when the bones are at hand, it appears also that if we can ensure the delivery of a genuine article, it will be still better to buy this manure ready made. In this trial there could be no doubt that all the three forms of bones acted strongly, for the crop grew vigorously where they were used, while on spots where they were purposely omitted it could scarcely be said to grow at all; and though, from late sowing, and from being left too thick, the turnips had not time to come to maturity, the result was quite decisive for our present comparison. About a fifth of an acre was weighed on each piece, with the following results:—

Manure per acre.	Yield of	
	Cost.	Turnips.
	s.	cwt.
1. 20 bushels of bones	55 - -	44 $\frac{3}{4}$
2. $4\frac{1}{2}$ bushels of bones with 100 lbs. sulphuric acid	2 - -	49 $\frac{1}{2}$
3. 2 cwt. Mr. Fothergill's su- perphosphate	14 - -	53
Present price	17	

The saving of immediate expense by Dr. Liebig's discovery is certainly very great, if we take it only as from 55s. to 22s. per acre on the turnip land, which should be one quarter of the whole acreage of a light arable farm. The trouble of preparation is slight, and of its application next to nothing; for Mr. Hornsby informs me that his turnip-drill will distribute equally as small a quantity as 15 bushels over an acre; as then the $4\frac{1}{2}$ bushels of dissolved bones do not require to be mixed with more than ten or fifteen bushels of earth, and his drill holds 25 bushels, the use of this compost would not require more than one stoppage for filling the drill on each acre.

Mr. Fothergill's preparation, if the quantity assumed be correct, was still more successful, and having tried it elsewhere I am enabled to speak most highly of it. A neighbour to whom I supplied some,

found that 2 cwt. of this superphosphate, costing then 14s., answered better on his land for turnips than $2\frac{1}{2}$ cwt. of the best Peruvian guano, for which he had paid 32s.

It is a grey damp substance, partly a powder, partly in tough lumps like dry dough. The same lumps are found in the compost as I prepare it myself. It would evidently be a great waste of manure to drill these lumps into the land without reducing them to powder; but this is not easily done, for they are so tough that no pounding will crush them. As the point is one of importance, I may mention the method we at last hit upon. The whole mass, mixed with ashes, should be passed through a large coarse wire sieve, and the lumps then be spread about two inches thick on a hard floor. A small garden roller should then be drawn over them backwards and forwards until they are flattened to a uniform cake. If the workmen now work this cake with a fine garden rake, they will find that the tough mass will crumble between its teeth. I dwell upon this, because I think we ought to make it a rule in the use of all artificial manures, by bringing them into a state of powder, and mixing them thoroughly with dry mould or ashes, to spread them so uniformly in the soil that each rootlet of the future crop shall have as fair a chance of finding its portion of food as if liquid manure had been used.

Having tried the method described above, I venture to recommend it to farmers; but I consider it by no means a perfect prescription. It is not clear whether the second fermentation should be allowed to take place or not. It is by no means clear that the proportion of acid (one-half the weight of the bones) might not be diminished. It is doubtful whether the amount of bones, $4\frac{1}{2}$ bushels, be the right dose per acre. It is very likely that phosphorus should not be administered singly, but should be combined with potash, as Dr. Liebig advises. These are points which I beg to recommend to our members for their future inquiry.

Before concluding, I must mention a process long known in this neighbourhood, which seems curiously to agree with Dr. Liebig's treatment of bone-manure. Mr. Brooks, of Hatford, has for many years assured me that he could make four bushels of bones go as far as twenty bushels by mixing them first with peat-ashes. It occurred to me that since many peat-ashes contain sulphate of lime, this practice might be a self-taught form of the recent scientific discovery. Following his instructions, I mixed eight bushels of crushed bones with sixteen bushels of our brick-coloured peat-ashes, and the mixture was thrown up in a heap. In a few days they began to heat violently, and the heat lasted for about ten days, at the end of

which time, on opening the heap, scarcely a particle of bone could be detected. The whole was reduced to a fine reddish grey powder. The fragments of bone which still showed themselves were exactly like those which sulphuric acid has acted on. On trying this compost by the side of superphosphate with a crop of turnips the effect was precisely the same. Whether the cause be the same, one cannot of course be certain, until a chemical analysis has been made. The ashes cost only 4d. for two bushels, the acid would have cost five times as much. The trial, therefore, will be worth making for those who have bog-peat at hand; though peat varies so much in its elements that there can be no certainty of success. If it fail, there will be nothing lost; if it answer, it may be useful, in Ireland especially. The ashes must be moderately damp, for dry ashes, I found, do not exert any action upon the bones.

Such are the assured advantages to be derived to the turnip crop by the solution of bones; but we may further hope to see the use of superphosphate extended even to corn crops. Theory certainly requires it; for, according to Boussingault, a crop of four quarters of wheat to the acre draws from that acre of ground at least 30lbs. of phosphoric acid. Experience countenances it, for though bone-manure is usually applied to the turnip crop, its effects, as is well known are seen in the following corn crops. But further, a direct experiment, too, has proved its success. This was made by Mr. Pemberton Leigh upon wheat, and published in our *Journal** last year, but is so much in point that I must give it shortly again:—

One acre.	Cost.		Yield of	
	£	s. d.	wheat per acre.	Increase per acre.
			Bush.	Bush.
No manure - - -	-	-	29	
Rape-dust, 5 cwt. -	1	12 6	38	- 9
Urate, 6 cwt. - -	1	12 6	38	- 9
Dung, 30 loads - -	4	10 0	40	- 11
Guano, 3½ cwt. - -	2	4 0	40	- 11
Superphosphate, 6 cwt.-	2	4 9	53	- 24

The increase of 24 bushels, that is, three quarters of wheat per acre, by the superphosphate, is enormous, equal, in fact, to the whole average yield of many farms, and could hardly be expected again; but though we must not hope for so large a return in money as eight pounds for two, this manure is so cheap that a much smaller increase in the wheat crop would pay for its use.

I have drilled it in this year with wheat, but Mr. Leigh's plan of using it as a top-dressing in March may be a better one, because it is not wanted sooner, being chiefly required for forming the grain,

* See account given by Mr. Strouts, vol. v. p. 605.

and if applied in the autumn is liable to be washed down during winter. I think that it deserves trial on wheat, and I am sure that we ought now to give great attention to the cheapening of artificial manures. We have succeeded in reducing the expense of draining to one-third of its former cost, and I do not despair that, by equal perseverance, we may, in three or four years, bring down the cost of manures

in equal proportion. I believe that all bones should now be sold to the farmer in the cheaper and readier form of manufactured superphosphate: and that of all compound manures, though potash and ammonia may be required in them, a main ingredient must be phosphorus.—Journal of the Royal Agricultural Society.

Pusey, December 29, 1845.

LECTURE ON AGRICULTURE, AND THE USES OF LIQUID MANURE.

According to announcement, Mr. Moore, the secretary to the Metropolitan Sewage Manure Company, in compliance with the request of several influential agriculturists, delivered a lecture on agricultural development, embracing the application and advantages of liquid manure, to a large meeting of agriculturists, at the Institution, at Staines, on Wednesday evening. The lecturer stated that gratitude required that he should acknowledge the very kind manner in which he had been received by all the parties interested in agriculture that he had had an opportunity of meeting in that neighbourhood during the last three weeks, and which induced him to comply with their request to meet on the present occasion as farmers, for the purpose of eliciting the development of the capabilities of their profession. There never had been a period which required their resources to be so fully carried out as that of the present: the measures that had lately been laid before parliament required this. Although there is every reason to expect that the value of agricultural produce will be considerably reduced by the measures referred to, he had no fear of the result so far as the farmer is concerned. But although the manufacturers had been the most urgent in the forwarding of these measures, it is very likely that ultimately they will have the greatest reason to complain of their effects, as the capabilities of the manufacturing interests in this kingdom were at present fully developed in accordance with the present state of science; and notwithstanding their being so, the manufacturers of other countries were able in several articles to compete with and supersede them, particularly so when unprotected by duties. But the capabilities of the agricultural interest were not at present more than half developed in accordance with the present state of science; thus in consequence of the deficiency of scientific knowledge and inattention on the part of the practical agriculturists of the kingdom, fully one half of the raw material available for [the manufacture of food was lost, and the annual present money-value of that loss is equal to the annual profit on the foreign commercial and manufacturing trade of the kingdom. The isolated situation of the farmer is some excuse for this. Many persons consider that his employment is only adapted for the ignorant portion of the population, yet there is no employment or profession requiring so much scientific knowledge. For instance, every farmer before taking a farm should

know sufficient of geology and chemistry to be able to form a correct idea of its value—even the elements contained in its composition; and, when preparing for the production of a crop, he ought to know the elements of which it was composed, so as by putting the same elements together in the form of manure he may be certain to produce the article. This is the manner in which the manufacturer proceeds, from his knowledge of science. As a farmer, yea, a practical farmer, who had during the last twenty-five years brought to bear on agriculture the science of the day during that period, he was compelled to admit that during twenty years of that period he had been sustaining that proportion of loss on the farm which he cultivated; and it was only by accident that he was convinced of his error, although he had seen the principle upon which it was founded in Sir H. Davy's Agricultural Chemistry many years before; but the principle there stated was for many years considered by practical men as mere theory, and inconsistent with correct practice.* The loss referred to is sustained by the general neglect of the liquid manure made on the farm, and also by allowing the solid manure to ferment and decompose to so great an extent before it is used, that the principal part of the most valuable portion of it (being volatile) has been dissipated. The soil also by improved cultivation is capable of bearing a considerable increase of crop. He was glad to be able to admit that many of the farms in this neighbourhood were in a high state of cultivation, in proportion to the depth to which they were cultivated; but he was convinced that if land were improved to the depth of twelve or sixteen inches, instead of six or eight inches as it is at present, such land would not only be less susceptible of the vicissitudes of the weather, but would also yield crops approaching to double in amount, for the roots of the plants would obtain food at a greater depth, instead of being forced to contend with each other for food near the surface, in a limited sphere. The first step in this improvement is that admirable system of thorough draining and subsoil ploughing introduced some years ago by Mr. Smith, of Deanston, and which is absolutely necessary for all soils that are so adhesive as not to absorb *all the rain water* as it falls upon them: this system has more than doubled the value of most of the land to which it has been applied. Some years back, the Right Hon. Sir James Graham published an account of an ex-

periment made by him on this principle. He had a field of very inferior land let to a tenant at 5s. per acre, who complained that it was not worth the rent, as scarcely any animal would eat the grass that grew upon it; which induced the landlord to take it into his own hands, and try the effect of Mr. Smith's method of improvement. It was accordingly thoroughly drained, and subsoil ploughed, and manured for a green crop; after which it was sown with a corn crop and grass seed. After the crop of corn was removed, it being then under clover, it was valued, and let to a tenant on a twenty-one years' lease, at a guinea per acre; if his memory was correct, he thought it was stated that the proceeds of the green crop and corn crop amounted to the whole of the expense incurred in the improvement. This proved the correctness of a statement made by Lord Stanley, some time after, at a public meeting in Liverpool. His lordship stated that there was no bank so safe, or investment of capital so profitable, as the judicious application of capital to the improvement of the soil. Of the correctness of this, he (the lecturer) was perfectly satisfied from practical experience, and fully expected that when his lordship and the right hon. baronet came into office, and at a time when the operatives were nearly in a starving condition from the want of employment and a deficiency of food, and an immense amount of capital in the metropolis unemployed, a direction of such capital to the cultivation of the soil would have been given (by legislative enactment or some other mode), which would have given employment to the people, and increased the quantity of food for their support. Why did not this take place in accordance with their acknowledged experience on the subject? This question I cannot answer; it is most likely that difficulties then insurmountable presented themselves. I will not venture to say that the measures lately brought forward are introduced for the purpose of removing them. It is generally admitted that a proprietor ought not to expect that a tenant will invest his capital in the permanent and annual improvement of a farm, without a lease for such a term of years and at such a rent as will afford him an opportunity of getting his capital back again, and also a profit for such investment before the expiration of his term: this may be considered by some persons a digression from the subject, but it is so connected with agricultural improvement that these few remarks are scarcely avoidable. After the land has been treated as recommended by Mr. Smith, it will be necessary to give it an increased quantity of manure, so that its capabilities in the production of greater crops may be fully exemplified. It may be asked, From whence is the additional quantity of manure to be obtained? In reply, he not only suggested the necessity of saving the liquid manure that is made upon the farm, and prevent the deterioration of that which is solid, but also to solicit the attention of the farmers of this neighbourhood to a source of supply that is ample to the utmost extent of their wants, and on such terms which by persons not conversant with hydraulics and mechanics can scarcely be credited. A company has been formed for the purpose of transmitting the sewage manure of the metropolis into the country to the extent of twenty-five miles, by

the means of steam power and pipes, which will enable the company to distribute it in the fields for the farmers at as low a price as it would cost them to cart it from their farm-yards and distribute it on the fields. It is intended to lay the main-pipe along the main-road through Hammersmith, Brentford, and Hounslow, and branch mains on to Chertsey, Staines, and Colnbrook; from which service-pipes will be laid at about half-mile distances into the lands where the manure will be required: taps will be in the service-pipes at certain distances, to any of which a hose-pipe can be attached by the company's men for the purpose of distributing the liquid manure in the respective fields, as may be required. The facility and economy of this mode of transmission and distribution enabled the company to supply it on such low terms. Some persons have imagined that it is the solid part of this manure that is the most valuable; but this idea is inconsistent with correct principle, and also proved to be so by practical results, in the neighbourhood of Edinburgh, where the liquid manure of that city has been applied during the last hundred years, and from which application the land is yielding a rental of £30 per acre. This result is from the effect produced by the manure that is held in a state of chemical solution, and not from the solid matter in a state of mechanical suspension. A reference to a very simple fact with which we are all conversant will sufficiently illustrate this principle: we all know the great proficiency of the ladies in the making of tea—how do they proceed? They pour boiling water upon the solid vegetable that they put into the teapot; in the course of a few minutes they pour out the exhilarating beverage as clear (but coloured) as the purest water. When they are satisfied in having thus exhausted all the virtue of the tea, what becomes of the solid matter? We all know that it is thrown away as useless. Similar treatment is adopted with the liquid manure of Edinburgh: small cesspools are made along its main course, in which the solid matter is allowed to fall as deposit before the liquid is put over the land; and this solid deposit, when occasionally cleared out, is disposed of as of very little value. One of the very great advantages in the application of liquid manure is, that it is just in the very state ready to be taken up as food by the vegetable kingdom, as it is well known that no vegetable can take up solid manure before it becomes in a state of solution. The lecturer referred to several other advantages attendant upon the application of manure in a liquid state, and then requested that if any gentleman present saw any difficulty or obstacle that might interfere with the operations of the company, it would be stated, that an opportunity might be afforded to discuss the subject impartially. One gentleman inquired how the pipes could be preserved from the effects of frost? To which an immediate reply was given. By conveying them underground about two feet or so, according to circumstances.

The persons present appeared greatly pleased, and a resolution of thanks to the lecturer was proposed by the chairman, F. Sherborn, Esq., seconded by A. Wood, Esq., of Littleton, and carried unanimously.

IS CHALK MANURE?

IMPORTANT DECISION IN FAVOUR OF AGRICULTURE.

A case of the greatest interest to agriculturists came before the Dorset Quarter Sessions, on Wednesday, the 8th instant, in an appeal made by Isaac Rendall, the keeper of the Hill Butts turnpike-gate, on the Wanborne Trust, against the decision of two county magistrates, who had convicted him in the penalty of 45s. for taking toll for a waggon-load of chalk. The facts of the case were admitted, and the only question for the decision of the court was that prefixed to this report—"Is chalk manure?" Mr. Ffooks, for the convicting justices, contended that it was, and cited two old books as authorities to show that it had been so considered years ago. The first of these works, published in 1718, was entitled "Ichnographia Rustica; or, The Nobleman's, Gentleman's, and Gardener's Recreation; containing a General System of Agriculture," by Stephen Switzer, gardener several years to Mr. Loudon and Mr. Wise." In speaking of the improvement of arable land, this writer says—"And if the country naturally produce chalk or marl, either of them will be a proper manure for once, by which means you have one or two, or perhaps three or four changes." The other work, which bore date 1727, purported to be "A Complete Body of Husbandry, collected from the Practice and Experience of the most considerable Farmers in Britain," by R. Bradley, professor of Botany in the University of Cambridge, and F.R.S. Mr. Bradley writes—"Among other things for the improvement of light lands, chalk is to be used; that is, such chalk or white clay as is greasy or binding, or has a viscous matter in it. This husbandry of chalk is taken notice of by Julius Cæsar in his 'Commentaries.'"

Mr. Stock, in a shrewd and argumentative address for the appellant, said he would rather take the opinion of a better known and more popular work than either Mr. Switzer's or Mr. Bradley's on this matter, and that was Johnson's Dictionary. He therein found manure thus described:—"Manure—noun substantive, from the verb—soil to be laid on land, dung or compost, to fatten land." "Manure—verb—to cultivate by manual labour, to dung, to fatten with composts, to fatten as a compost." Now, he contended that chalk could not come under this designation, for chalk was not a fattener of land. And, as far as regarded the words of the Act 5 and 6 Wm. IV., cap. 18, which exempted manure from toll, and which ran thus:—"That no toll shall be taken for horses conveying only dung, soil, compost, or manure (except lime)." He contended that the legislature, by mentioning "dung, soil, or compost," intended evidently to exclude from the exemption all substances not containing the qualities of dung, soil, or compost. The question he submitted was, "Is chalk a manure by itself?" He apprehended it was only useful when mixed with other substances; and therefore, although it might come in under the head of "substances used for manuring," it

could not be considered as manure by itself. Chalk was used for many other purposes besides manure; and if this exemption were allowed, it would be in the power of any person to claim that exemption, even if he did not intend to use the chalk as manure. As far as the justice of the matter was concerned, he should show that the chalk waggons passing through this particular gate were so heavily laden as to do more injury to the road than any other vehicles; and at this particular time the trustees of turnpikes required protection, suffering as they were under the formidable opposition of the numerous railways. For all these considerations, he called on the court to quash the conviction.

After evidence had been produced to confirm the latter part of the learned counsel's statement, the court said they were perfectly satisfied that chalk *is a manure*, and they confirmed the conviction.

Application was then made for costs, the granting of which was in the power of the court; and although Mr. Stock fought hard against it, contending that, as the matter had been contested with amity, with a view to obtain the opinion of the court upon the question, the appellants ought not to be punished by being obliged to pay heavy costs. Still the court said they thought it a very proper application, and they should grant costs, to be taxed by the proper officer of the court.

SOOT POR POTATOES. — Not at all agreeing with those who advise a decrease in the cultivation of the potato, I still think it unnecessary to occupy your columns with arguments for its continuance; believing that its importance will be too much felt in practice, to admit any great danger of its being neglected. A far more desirable object appears to me the restoration of its health and hardness. The history of the potato disease, from its first appearance a hundred years ago, is that of an increasing tendency to putrefaction and decay; and what else could have been expected from a plant, set year after year, with its cut faces in contact with fresh or fermenting dung, the juices of which thus mix with those of the plant crop after crop. What other vegetable has been subjected to such putrefactive treatment? The obvious remedy appears to be, anti-putrescent dressings. And how have these answered, where tried? Peat is eminently antiseptic; and potatoes grown in peat, how little comparatively they have suffered; and how highly they have been esteemed for seed, for the greater part of a century! Next, those grown on Stinchcombe farm from soot (described in Morton's treatise on soils), where they grow their own seed successfully for thirty years. Even last year, when the rot was at the worst, see Mr. Barnes's small experiments, reported in *Johnson's Gardeners' Almanac*, where potatoes dressed with soot and charred refuse, both antiseptic, turned out mostly sound (and still con-

tinued so at the last report), whilst with all other dressings they took the rot. But if soot is the most promising remedy for the present potato disease in this country, it is also to be had more abundantly here than elsewhere; so that it may be used freely (say twenty bushels per acre, with the requisite inorganic salts), especially where growing for seed, for which purpose peaty and high ground should be preferred; and thus

we may reasonably hope that the tendency to decay would be thrown off much faster, with the help of vital action, than it has been brought on by the admixture of putrescent dung juice with the sap of the plant. It is needless to occupy your columns with reasoning that has already been several times repeated. The principle is simply the application of antiseptic dressings to remedy the tendency to putrefaction. J. BRIDEAUX.

THE FOREIGN HOP DUTY.

The following paper on this subject has been issued by the West Kent Agricultural Protection Society:—

PROTEST

Against the Proposed Reduction of the Import Duty on Hops. Respectfully submitted to the consideration of Members of Parliament.

The hop planters of the county of Kent being seriously impressed with the conviction that the reduction of the import duty on foreign hops, now proposed by government, will have a most injurious effect upon the interests of all parties engaged in the cultivation of the hop, venture with great deference to lay before you a few observations bearing on the subject.

They would commence their remarks by observing that the special reasons set forth in justification of the alterations in the laws affecting corn are not in the least degree applicable to the case of hops, there being neither deficient supplies, anticipated scarcity, nor high prices; nor can any probability of the slightest benefit to the consumer be adduced in support of the measure, as it is a well-known fact that the price of beer has never been affected by any variation in the value of hops, that the total cost of that ingredient in the ordinary beverage of the people is less than two-thirds of a farthing per quart, and that if the consumer reaped the whole benefit of the intended remission of duty, it would amount to little more than one farthing per gallon.

The statement made by Sir Robert Peel as to the unfounded alarm on the changes proposed in 1842 is to a certain extent incorrect, as, at the period when the alarm was expressed, the government had not made known their intentions respecting hops; but upon the planters being informed that a protective duty to the extent of £4 10s. per cwt. would still be continued, their alarm subsided, and a general opinion prevailed that the proposed protection would prevent the ruinous competition which they had anticipated.

This opinion has since been borne out by the fact that at a subsequent period, when the prices were barely remunerative, foreign hops were offered for sale by sample in the London market at very low prices, and upon which a large profit might have been realized if the import duty had then been £2 5s. instead of £4 10s.; and it is submitted that the inferences drawn from the fact, that but a small quantity of hops have been imported, are somewhat premature, because a plantation of hops cannot be raised to full bearing in less than three years—a

period which has barely elapsed since the last change in the import duty took place.

The peculiar circumstances affecting the cultivation and the trade in hops may with much reason be urged in suggesting a course of legislation different to that applicable to corn. All hops of home-growth are subject to an excise duty of 19s. 7d. per cwt.; and although the heavy expenses of cultivation are much the same annually, the crop is exceedingly variable, being subject to all the ordinary vicissitudes to which corn crops are usually liable, and to many others more serious, but peculiar to itself, to which facts alone the fluctuation in prices can be attributed. As it is generally admitted and avowed that foreign importation will tend to create low and steady prices, and that importation can only take place at a period of diminished home supply, it follows that the home planter will then be prevented from realizing that enhanced value of his produce to which he is fairly entitled, and upon which alone he can rely to compensate himself for the low prices to which he must occasionally submit.

An average crop is more than sufficient for one year's consumption; and when large crops occur, the supply being greater than the demand, the cultivation is usually attended with loss, and the planter is generally compelled to hold his produce in hand for a considerable period after he has paid the excise duty, the payment of which, because of the larger quantity he has grown, absorbs a larger portion of his capital, when from the same cause he is under great disadvantage in the sale of his produce. The importer, on the other hand, possesses the great advantage of bonding his commodity until a favourable opportunity for its disposal occurs, and of not being called upon to pay the import duty until the scale is affected.

The land upon which hops are produced, although not capable of yielding larger crops of corn than the land adjoining, has been subjected by legislation to heavy additional taxation, being valued for the purposes of the poor-law assessment, and also for the commutation of tithes, fully one hundred and fifty per cent. above the average value of arable land in the same locality; and these peculiar burdens on hop cultivation, tantamount in effect to doubling the rent on the land, were imposed at a period when the British planter was deriving the benefit of an import duty on foreign hops equivalent to an absolute prohibition.

The following calculations are submitted in order that

the extent of the interests concerned in the question may be fully understood.

In the county of Kent alone there are now upwards of twenty-three thousand acres of land planted with hops, on which a capital of about two millions has been permanently sunk in raising the plantation and erecting the requisite buildings, &c.; and the additional capital annually employed in the cultivation is estimated at upwards of nine hundred thousand pounds. A large and increasing labouring population meet with nearly constant employment at a high rate of wages in the hop districts, and the sum annually paid for manual labour alone is calculated at two hundred and thirty thousand pounds annually, which exceeds the amount usually expended for the same purpose on a similar breadth of arable land by upwards of one hundred and sixty thousand pounds. The extra tithe paid on the hop land amounts to between twenty and twenty-five thousand pounds annually; the average excise duty paid for the last five years has been about one hundred and fifty thousand pounds, equivalent to six pounds ten shillings per acre, which amounts to more than the rent, tithe, rates, and taxes combined. These details, although prepared with reference to the county of Kent alone, it is

believed would apply to the kingdom generally, in which case the results would be doubled in amount.

In 1842, when the last alteration in the import duty took place, the planters were led to suppose that no probability of any further change existed; and acting upon that impression, since that period the cultivation has been much improved, the plantation renewed and increased, new and expensive buildings and apparatus have been extensively erected, all of which has been effected at a time when, from circumstances over which they could have no control, their profits have been very small.

Upon reviewing these and other points peculiarly affecting their position, the hop planters consider themselves perfectly justified in earnestly protesting against the proposal of government, and in asserting that it is fraught with the greatest injustice, and must ultimately result in most serious injury to their welfare; and in conclusion, they would respectfully submit that the intended import duty on foreign hops be increased by the addition of the home excise duty thereto—that is to say, to £3 5s. instead of £2 5s. per cwt.—or that the home excise duty may be entirely removed.

GREAT PARISIAN PRIZE CATTLE SHOW.

For six centuries the cattle market, or Smithfield, of Paris has been held at Poissy, in the neighbourhood of that capital, where, every year, the most enormous, though certainly not always the most handsome beast, has been selected from among the oxen fatted to compete for the honour of displaying their proportion in the grand *cortège* of the carnival, as the *Bœuf-gras*, to the great delight of the Parisian population.

The narrow field for competition presented by this species of secular encouragement bestowed upon the greatest volume of osseus matter, not having been found to answer the exigencies of the present day for an improved culture of the cattle of France, to keep pace with the efforts of the agriculturists of England, the French Board of Agriculture determined, three years ago, to supply this neglect by the serious and judicious encouragement of the indigenous races of cattle, as well as of those crossed with foreign breeds. For this purpose prizes were instituted, and offered by the Government, for the competition of those breeders who should produce cattle whose net weight, and presumptive quantity of meat of good quality, and whose beauty of form, should entitle them to that mark of encouragement by their superior claims. To these prizes given by the Board of Agriculture, the town of Poissy adds two more; and on the 9th of April the third annual prize cattle show took place.

Notwithstanding the bad weather a great assemblage of agriculturists, butchers, and lovers of sights repaired to Poissy at an early hour, and the exhibition was open till two o'clock in the afternoon. The cattle were all

ranged in good order in the spacious square of the market, under convenient sheds, erected expressly for the occasion. Those to which the prizes had been adjudged were crowned in true French fashion with laurels, the competitors being designated alone by a simple number affixed between the two horns. This mode of classification was found very unintelligible to the visitors, amounting to more than 2,000, who complained of so inefficient a method of designation, and of the want of some printed list, affording to each number the necessary description of weight, age, breed, &c., together with the place of birth, and the owner's name.

Apart from this neglect, and many others, much discussion, and, indeed, dispute, arose among the proprietors themselves; proving how little of unity of opinion exists among the breeders of cattle in France relative to the actual condition and the real merit of their indigenous breeds, their respective perfections, the necessity or utility of crosses with foreign breeds, represented at this show by the Durham race, the production of our celebrated Collins. In fact, there were almost as many opinions as agriculturists present. The majority, however, gave the preference to this cross, on account of its finer form and its greater disposition to fat at an early age. On the other hand it was averred that the Durham cross with the indigenous breed made but bad milch cows, were not prolific, and the oxen weak at work; while the flesh, though well marbled with fat, and tender, was of a bad colour, and less adapted for the table than some of the indigenous kinds.

This aptitude to fatten early was considered, neverthe-

less, by others, a quality of great value, and although the ox was still employed extensively throughout France in field-work, the time was fast approaching when the horse would be substituted, as in England, for that patient and docile symbol of rural industry. The early fattening of the bovine kind was considered a subject of the greatest importance, and it was hoped would shortly become a practice and study with the landed proprietors and farmers; though, at the same time, prudence was recommended by the committee, and the agriculturist was cautioned against all hasty prejudice in favour of particular foreign breeds, by which the good qualities already possessed by the indigenous races might be obliterated through an injudicious admixture of foreign blood. It was considered that many of the indigenous kinds were susceptible of great improvement by a judicious selection, and that the public money consecrated to so worthy an object would be nowhere better employed in the interest of the national wealth.

At this show 157 oxen were exhibited; of which 82 alone were selected to compete for the prizes. There were none of the *elephant*-oxen exhibited in the preceding year, and all the competitors were worthy of the prizes contended for; some, indeed, excited general admiration, and all acknowledged the correctness of the judges in the distribution of the prizes. As on the preceding year, the Marquis de Tarcy (department de l'Orne), bore away the palm. His ox, Durham-Cotentin, three years old, weight 900 kilos, reared and fattened in his stalls, was a remarkably beautiful animal, uniting every requisite. A Charolais ox, of the same age, belonging to Mr. Massé (department du Cher), had as many admirers; and Mr. Hervien (department la Nièvre) gave another evidence of the perfection attainable by the fine race of the Charolais crossed with the Durham.

Great improvement was remarked in the Salers breed of Auvergne. The hind quarters of these, however, were not without fault; although the three specimens exhibited possessed great merit. The flesh of this breed is much esteemed; it admits of fattening when young, and produces on an average 600 kilos of net meat.

Many agriculturists demanded loudly to be informed of the *cost* of all this, and the net amount of returns on all these *chefs d'œuvres*. The question was, perhaps, not exactly an indiscreet one; for the farmer cannot exactly afford to produce fat for the mere love of fat; but it was considered rather premature. And, as a new road was about to be opened, a certain gratitude was thought due to those who were throwing it open at certain sacrifices, which no prize would wholly reimburse. Mr. Ladrey, of Venille, near Nevèrs, for example, had received 500 fr. (20*l.*) prize for some very admirable sheep, which cost him 1,200 fr. (48*l.*) in travelling expenses.

A handsome tent, but rather too small to contain the spectators for which it was intended, had been erected for the persons invited. The committee, the Minister of the Board of Agriculture and Trade, accompanied by a numerous *cortège* of patrons of the agricultural interest, Messrs. Decazes, Dupin, sen., Darblay, Dailly, de Romanet, &c., were assembled; and, after a speech from M. Crenin-Gridaine, whose voice, by the bye, smothered by the lowing and bleating of the animals, was scarcely heard, the Prefect of the Seine and Oise pronounced a short address, when the names of the successful candidates were called over, and the sitting was closed rather abruptly. The public were disappointed that the report of the committee was not read, which upon such occasions has hitherto been usual, and is considered both necessary and desirable; but it appeared that M. Yvart was obliged to be absent on family affairs, and no other member of the committee had been selected to supply his place. This inattention was much censured.

The highest prize for oxen was 1,200 fr. (48*l.*), and a gold medal to the ox previously named. The lowest ditto, 500 fr. (20*l.*) and a silver medal.

The highest prize for sheep was 600 fr. (24*l.*) and a gold medal, for sheep of the *Dishley-Arterien* breed, twenty-four months old, weighing, without wool, 1,370 kilos. The lowest ditto, 400 fr. (16*l.*) and silver medal, for *Solognote* breed, twenty-four months old, weighing 830 kilos. without wool.

ON THE BREEDING, FEEDING AND GENERAL MANAGEMENT OF SHEEP.

BY. T. E. PAWLETT.

It is not my intention, in offering the following pages to the notice of your Society, to enter into a lengthened discussion derived from a speculative knowledge of the subject in question, but I shall endeavour to confine myself chiefly to the relation of experiments, which have been made and tested by myself, offering at the same time such remarks and observations as may have occurred to me whilst they were in progress: and here I may observe, that the trial of any of them was not left to the care

of another person, but all were begun and carried on under my own eye, as far as circumstances would allow. It has been my practice for more than twenty years to weigh some of my sheep monthly, almost all the year round, to try various kinds of food and methods of management, and always in the most accurate manner, by using dead weights, and not upon the steelyard principle, which, by weighing anything alive, is liable to great variation. For instance; if I were to weigh a

lot of lambs alive, which I frequently have done with the common steel-yard, by taking two saddle-girths, and placing them under the belly of the animal, one as near the hind legs as possible, and the other immediately behind the fore legs, and so when the steelyards were attached to the girths, suspending the lambs from a pole resting upon the shoulders of two men, I have invariably found that they would weigh by this method from 3 lbs. to 4 lbs. each more than they afterwards have done (on the same day) by scales and weights. I have also endeavoured to weigh my sheep as nearly at the same time of the day as I possibly could. I believe in all trials of animals a number should be taken for the experiment, and never less than six or eight. I generally, in the following accounts, have selected eight lambs, as it is the average of the lot that must be looked at, and not the individual increase of any one of them. It is astonishing sometimes to find so much variation as I have seen among a lot without any apparent cause; some may not have been in good health when the weighing day came, have had a little scour upon them, and others may not have taken so much food as usual. The sheep with which the following experiments were made were all of the Leicester breed, and bred by myself. Being a ram breeder, perhaps it will be received with some suspicion when I state, that it is of the greatest possible advantage, in order to get a good breed of sheep, that the very best rams should be procured; nevertheless it is true for I have had abundant proofs that the produce inherit considerably more of the qualities of the male (whether good or bad) than they do from the female; indeed, I consider the male almost everything in getting a good animal: I do not, however, wish to be understood that the properties of the female are quite inactive in the process of generation, and that the produce does not in a measure partake of her qualities. I would recommend that the greatest care should be taken in drawing the ewes for the rams, so that whenever there is a defect in the one, it may be counteracted by the others possessing good points in that particular. Great difference of opinion exists whether it is right or not to cross animals in breeding. By crossing I do not mean mixing two distinct breeds, but changing from one flock to another of the same breed; many are the advocates for it, whilst a few persons contend for breeding in and in. From a long experience and close attention to the subject for more than twenty years, my mind seems more disposed to favour the latter than the former. I do not, however, recommend that animals closely allied by blood should be put together generally; yet I have known very good sheep, for instance, produced by putting the son of a ram called A to a daughter of

A, in cases where their points would suit each other; and I should never hesitate in doing so. I cannot see the utility of crossing for the sake of crossing or changing, unless I can perceive superior qualities in another person's flock which mine do not possess; even in that case if my neighbour's flock were not quite so well bred as my own, I should long hesitate before I had anything to do with it, as the more I see of breeding, the more I am convinced of the advantages to be derived from using well bred, indeed the best-bred animals.

In the breeding of sheep there is much to be attended to—size, wool, constitution, quality of mutton, form, &c.; yet I think propensity to fatten of paramount importance. Having drawn the ewes for the rams, the next point to be considered is, which is the best method—To turn the rams loose amongst the ewes in the common way, or put them in stocks for the rams. I invariably adopt the latter, as I get far fewer "guest" or barren ewes by this than I should by the former practice. It very frequently happens that rams are put loose with the ewes when they are much too fat; many are therefore very idle, and will not tup an ewe unless under favourable circumstances; they may serve some, and jump others, and if they cannot succeed after two or three trials, will leave the ewe entirely and go to another; she misses this time, and perhaps also when she returns again. When ewes are served in stocks, the shepherd of course sees that all is done right. The general opinion is, that once serving an ewe is sufficient for her to be inlambd; experience has convinced me that twice is much more safe, and I will adduce an instance of it, which led me to the custom which I always adopt, of having all my ewes served at least twice by the rams. On the 17th of October, 1835, I put 31 ewes to 5 different rams; 22 of them were tupped twice each, a few hours elapsing between, and at the usual time when they would have returned, had they not been inlambd, only one did return. The remaining 9 ewes were tupped by the same rams only once each, and 5 of them returned or went over again. From this it would appear, that out of 100 ewes served twice, 95 would be inlambd; while out of 100 served only once, 45 only would be inlambd; showing a decided preference for stocking the ewes, and having them tupped twice. I have been accustomed for many years to set down daily every ewe that went to the ram, and find that they return, if not inlambd, at from fourteen to eighteen days afterwards; scarcely any come again before fourteen days, and very rarely any later than eighteen days. I found by observations made in the lambing seasons of 1831 and 1832, that my ewes went with lamb as follows, and I was enabled to come to a certainty upon this point, as I always

number my ewes, also my young lambs, and set down every day the ewes as they take the ram:—

	Weeks, Days.			
The longest time any ewe went with a ram lamb was	-	-	22	4
The shortest time	-	-	21	0
The longest time any one went with an ewe lamb was	-	-	22	2
The shortest time	-	-	20	4

This proves the general opinion to be correct that animals go with young longer with males than females, but the difference is very trifling.

It is the custom in many parts of the country to dress ewes with mercurial ointment in the autumn, whether they are affected with the scab or not; and a question often arises in the minds of some persons how late in the season, when the ewes are perhaps heavily inlambed, such operation may safely be performed without any injury arising to the young lamb within. In the autumn of 1834 my ewes were lined or dressed with ointment in the usual way; but in consequence of some apprehensions that they had caught the scab some time after they were dressed, or might break out with it in the spring, I determined upon giving them a second dressing, which was performed on the 9th and 10th of January, the ewes being considerably more than half their time gone with lamb. They were turned upon their sides as usual to be dressed but no lines were put down the belly of the ewes. I found that no injury arose from the dressing, as they lambed quite as well, and the lambs were as healthy as usual. I had one ewe lined a third time, to try whether the ointment would affect her, being inlambed, which was done on the 10th of February. She yeaned a lamb quite healthy on the 23rd of March. I believe dressing with ointment does not affect old sheep so much as lambs. A few years since I sustained two or three great losses from my lambs having been dressed with mercurial ointment. The weather setting in very hot some days afterwards, the greatest part of them were attacked with inflammation, and many died: in one case they were lined with ointment about the 11th of October, and in the other about the middle of February.

When ewes are with lamb they are very susceptible of taking cold, and due attention should be paid to them that their lair is clean and dry, particularly a few weeks before the lambing season commences. If they are allowed to remain in wet weather on the turnip land when it is very dirty, in many cases the loss will be great, which I have proved from experience. In the winter of 1832 all my ewes were put to turnips, and remained upon them until the 1st of February. Having bought this year a quantity of high-priced ewes, I

drew from the flock 21 of them, and kept them on grass land, and they were fed daily with turnips from the 1st of February; the remaining part of the high priced lot of 35 were left with the flock upon the turnip land, and fed in the common manner, the land being exceedingly wet and dirty nearly all the month of February. About the end of that month those on the turnip land began to cast their lambs before the proper time, and those ewes which went their full time, many of them brought dead lambs, and of those that came alive many died a day or two afterwards; whilst those 21 ewes which were kept on grass were healthy and went on well: 18 of them lambed by the 1st of April, and had 16 lambs alive. From the 35 ewes kept on the wet land 5 were guest, 30 had lambs, and only 11 lambs were alive from them on the 1st of April.

It is also highly necessary to keep the ewes well, and they should have some dry food, either corn, hay, or clover chaff, at least three weeks or a month before lambing, to force their milk and keep them in a healthy state, or there will in many cases be much loss with the young lambs. Before I kept my ewes well I lost many lambs when young, it being my usual custom to keep them on Swede turnips. A few years ago I determined to keep them better, by giving them with the turnips plenty of good hay every day for three or four weeks before they lambed. I tried this plan with the first 100 ewes that were to lamb, and I scarcely lost a lamb out of the 100 ewes. The next lot of 100 ewes were kept on Swedes, which had been eaten off to pecking during a snow by other sheep, the ewes eating the part pecked up without any other food, and the consequence was that a great many of the lambs died. They generally came alive, but died in two or three days afterwards, being weak and unhealthy in their appearance. I lost as many as five or six lambs a-day sometimes, and I believe from no other cause than not keeping their dams well before lambing; those lambs which lived, did not thrive well being short of milk: it is of little use to keep them well after lambing if the milk is not forced before. When a lamb dies, and another is intended to replace it, I let the dead lamb remain with the ewe for about a day before it is removed; it is then skinned, and the skin is fastened on the lamb which is intended to be put to the ewe, which may be fitted very well if the skin is taken off the lamb by a skilful hand. The lamb being then put to the ewe, she will generally take to it in a few hours if confined in a small space.

Dipping lambs in the summer in a composition of arsenic and soft soap is become very general, and I believe is very advantageous to the lambs' pro-

gress; this should be done early in May, as the lambs will suffer much from the ticks if delayed until they are weaned, which often is not before July. Care should be taken to have the mixture from a druggist. I have known much loss from dipping where people have mixed the composition themselves. As the expense is trifling, I would recommend that the lambs should be dipped a second time when they are taken from the ewes, so that they may be clean from ticks during the winter. I never found it to be the least injurious to my lambs but think they appear to thrive much better after it.

Much difference of opinion exists as to the proper time for weaning lambs. No inconvenience would arise from weaning early in the season, provided the lambs have good, proper, and sufficient keep; this I proved in the year 1837. I weaned a few lambs on the 10th of June, weighed them, and after they had remained a few days on the land they were accustomed to, I took them to a pasture of sainfoin; some green tares and water were given to them; they were weighed again on the 10th of July, and I found they had increased in weight 16½ lbs. each. Another lot of lambs were weighed on the 10th of June, and continued with the ewes on good white clover; the lambs had, apart from the ewes, in a pen, tares and water given to them; these were also weighed again on the 10th of July, and gained only 12½ lbs. each, showing a difference for early weaning of 3¾ lbs. each lamb on the average; the weather was very hot and dry all the time. After this trial they were put together, and continued to be fed the same through the winter. Both lots were weighed again in the February following, when I found that those weaned early gained in weight 5½ lbs. each more than the other lot, which proves that lambs weaned early winter the best.

The weaning of lambs properly, and their subsequent treatment, is one of the most important branches in the management of sheep. If they are not attended to at this critical period very frequently they will soon go wrong and the loss be very great; they will have a fever upon them; many will die, and those that survive will not get over it for many months. I have found the following recipe (extracted from an old book on farming) of great benefit to lambs when they scour, and I am never without it:—

Epsom salts	6 ounces.
Nitre in powder	4 „
Boiling water	3 pints.

Pour the water hot upon the salts and nitre; with new milk (warm) add spirit of turpentine, 4 ounces; bol ammoniac in powder, ½ an ounce; mix and shake them well together. If necessary repeat the

drink every day or two. About 3 or 4 table spoonfuls may be given to a sheep for a dose, and lambs in proportion to their size.

I would recommend the manner which I adopt with my lambs when they are weaned, which is always to leave the lambs in the pasture that they are accustomed to for a few days, and take away the ewes to another and a distant close, that the lambs may not hear them bawl; if this be attended to they will lie quiet, and scarcely trouble themselves about their dams, but will disperse themselves over the pasture; whereas in the common way, by taking away the lambs to a pasture they have not been used to, they will lie at the gate they are put in at, fret and bawl, eat scarcely anything, and if the weather be unfavourable, and the pasture not suited to them will frequently go the wrong way. I prefer old keep, which has been eaten in the spring, whether sainfoin, red clover, or grass, to any of these that has previously been mown; but I believe no food so injurious to young lambs at this time as old white clover stubble, which is generally in a dry state in the month of July, and will very often cause them to scour very much, and consequently be in a feverish state. Water should be given to them if the weather be hot. Those who wish to get a few lambs very forward for any particular purpose, may give them some early cabbages or green tares upon the clovers, or indeed it would pay in a general way to keep the wether lambs well, if it is intended to get them fat for the butcher the following spring; they will get very fat if managed in this way. It is also very advisable to shift lambs about (I am now alluding to the general flock) from one pasture to another, and not let them remain for more than a week or ten days at a time in any one place; by so doing they keep more healthy, and are less liable to scour.

It is a great advantage to the young lambs to get them to either cabbages or turnips early in the autumn, as they will winter much better by getting used to their food before the wet cold weather sets in, and some dry food should always be given to them at this time, until at least they have sufficiently taken to the food upon which they are to remain for some time. Malt-comb, or clover hay cut into chaff are excellent for the purpose, and much better, I think, than corn so early in the season, as the roots early in the autumn are in a succulent state and very feeding. If corn and cake are intended to be used for the lambs, they ought not to be given to them until after Christmas. Cabbages planted out in April or May are the best food to make lambs fat that I ever met with: but they are an expensive root, and would scarcely pay any one to grow for sheep in a general way, to give them any quantity of them, or to be penned upon them

(it would answer, as before observed, to have a small quantity to throw to them on the clover leys), unless the land is adapted to their growth, as they exhaust it very much.

Where cabbages are not used, I consider white turnips the best food for lambs in the months of September and October, provided they are not too old, and much preferable to Swedes, which I think too strong at this season of the year for the delicate constitution of the young lamb. The white turnips should be cut, as the expense is but trifling over the old method. Now that we have in general use Gardner's excellent machine, the work, if done by boys, would not exceed the common expense of pecking, nor be more than about one halfpenny per head per week. In the year 1834, being desirous to test the qualities of the white turnips with the Swede, I selected a lot of lambs, weighed them on the 11th of October, and put part of them in a pen, and fed them with cut white turnips in troughs: the others were penned, and had cut Swedes given to them. They were weighed again on the 8th of November, and the result was found to be as follows:—

EXPERIMENT, NO. 2.

Lot of lambs fed on white turnips gained in a month each on the average 10 $\frac{3}{4}$ lbs.	Lot of lambs fed on Swedes gained in a month each on the average 4 $\frac{3}{4}$ lbs.
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being a difference of 6 lbs. each lamb in favour of cut white turnips in the month of October. I continued the experiment for some weeks by weighing the lambs occasionally, and found, as the cold and wet weather came on, that the white turnips became less feeding. In order to prove the feeding quality of the white turnip still further, as experience has taught me not to rest upon a single experiment, whether it relates to sheep or to different kinds of management for corn-crops, since in the one case the health or constitutions of the animals may be peculiar, and as regards corn or grain, the influence of this variable climate may operate differently in some seasons upon one sort, or method of management, than another, I therefore resolved to try the white turnips against cabbage, and selected on the 1st of October, 1835, some lambs, which were weighed. One lot was put on cabbage, with a few white turnips cut in troughs daily, with clover chaff; the other lot was fed on white turnips cut and clover chaff only. They were weighed again, October 30, and the difference was found to be as under:—

EXPERIMENT, NO. 3.

Lambs fed on cabbage and white turnips gained each on the average in twenty-nine days 12 $\frac{1}{4}$ lbs.	Lambs fed on white turnips gained in the same time each 11 $\frac{1}{2}$ lbs.
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This experiment shows but little in favour of cabbage (a known good food), but it will be observed that some white turnips were given with them.

Again, in the same month of October, 1835, two lots of lambs were weighed; and one lot was penned and fed on cut white turnips and clover chaff, the other was fed on cut Swedes and clover chaff, and a few white turnips. At the end of a month they were weighed again, and the result was:—

EXPERIMENT, NO. 4.

Lot on white turnips and chaff only, gained each in a month 8 lbs.	Lot on Swedes and white turnips and chaff, gained in the same time each 5 lbs.
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Difference in favour of using white turnips only 3 lbs. each lamb per month.

Since these experiments I have invariably used white turnips for lambs in the autumn, and find they are an excellent food, if not sown too early in the season, and preferable to Swedes during the months of September and October, equal to them in November or until the latter part of that month, and very inferior to Swedes in December, or when the weather becomes cold and frosty. Lambs are not naturally fond of white turnips, and will take to Swedes much sooner; and I generally give them a few Swedes first for a few days: and when my flock of lambs (viz. my ewe lambs) are intended to be penned upon white turnips without cutting, which is sometimes the case, I give them a few Swedes first, upon which they continue about two days; they are then let out upon the stubbles for two or three days more, when they are again taken to the pen of Swedes, which they will eat more freely; after which I put them on white turnips, and have no further trouble with them.

EXPERIMENT, NO. 5.

October 7, 1840, some lambs were selected from the flock and weighed: one lot was penned on cabbage, with red carrots given them in troughs; the other lot was also penned on cabbage, with Swedes given to them cut; both lots had clover chaff. They were weighed again on the 3rd of November, when those on

Cabbage and carrots gained each in a month 9 $\frac{1}{2}$ lbs.	Cabbage and Swedes gained each in a month 10 $\frac{3}{4}$ lbs.
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Being a difference of 1 $\frac{1}{4}$ lb. each lamb against the use of carrots.

EXPERIMENT, NO. 6.

Again, on the 28th of November, 16 lambs were weighed: 8 put to cut Swedes only, and 8 fed on red carrots and cut Swedes. They were weighed again February 22, the result of which trial was, those

Lambs fed on Swedes only gained each 18 lbs.	Lambs fed on red carrots and Swedes gained each 16 lbs.
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Both lots increased in weight but little, but the difference was against carrots.

EXPERIMENT. NO. 7.

Being another trial of carrots against Swedes. On October 12, 1841, some lambs were weighed: one lot was fed on cut Swedes only; the other lot was fed on red carrots and cut Swedes. Were weighed again November 23; those fed on

Swedes only gained in weight each lamb on an average 17 lbs.	Red carrots and Swedes gained in weight each lamb 14 lbs.
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Against the use of carrots 3 lbs. each

EXPERIMENT, NO. 8.

The Belgian or white carrot in trial against Swede turnips. December 22, 12 lambs were put to keeping: 6 of them to Swedes cut and clover chaff only, and 6 of them to the Belgian or white carrots, with some Swedes daily and clover chaff. At the expiration of the trial I found that those kept on

Swedes and chaff gained each on an average 19½ lbs.	White carrots and Swedes and chaff gained each 15½ lbs.
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Being an increase of 4 lbs. each lamb in favour of using all Swedes.

Having proved, by repeated experiment, and quite to my satisfaction, the inutility of using carrots for feeding sheep, I have discontinued growing them; they are an expensive root to grow, and must injure the soil for some time afterwards if it is not well adapted for their growth.

EXPERIMENT, NO. 9.

Between cabbages and Swedes. In the year 1836 I drew two lots of lambs, 8 in number for each lot; they were weighed; and one lot was put upon cabbages with some clover chaff only; the other was fed with cut Swedes and chaff only. After they had been kept in this manner a month, they were weighed again, and the result was found to be as follows:—

8 lambs on cabbages and clover chaff gained each 11 lbs.	8 lambs fed with Swedes and chaff gained each 8½ lbs.
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The increase of weight being in favour of the cabbages 2¾ lbs. each lamb per month.

Being aware that it was the custom with some sheep-breeders to wash the food—such as turnips, carrots, and other roots—for their sheep, I was induced also to try the system; and, as I usually act cautiously in adopting any new scheme, generally bringing it down to the true standard of experience, I selected for the trial two lots of lambs—one lot was fed in the usual manner on carrots and Swedes *unwashed*; the other lot was fed exactly on the

same kinds of food, but the carrots and Swedes were *washed* very clean every day: they were weighed before trial on the 2nd of December, 1835, and again on the 30th of December.

EXPERIMENT, NO. 10.

Lambs fed with food unwashed, gained each 7½ lbs.	Lambs fed with food washed clean, gained each in the same time 4¾ lbs.
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Which shows that those lambs which were fed in the usual way, without having their food washed, gained the most weight in a month by 2¾ lbs. each lamb. There appears to me to be no advantage in this method of management: indeed, animals are fond of licking the earth, particularly if fresh turned up; and a little of it taken into the stomach with the food must be conducive to their health, or nature would not lead them to take it.

Much having been said and written by high authorities upon the decided advantage to be derived from folding or feeding sheep in the yard during the winter months, I was consequently induced to try it, as my object has always been to adopt the very best system of management I was acquainted with for my sheep, and not to be bigoted to any opinion of my own unless founded upon actual experience; neither, on the other hand, do I adopt the recommendations of others upon a large scale at first. I selected, therefore, only 8 lambs for trial, of this highly-recommended method of yard-feeding, which were weighed on the 7th of December, 1839, and put into a yard made in the following manner. A small plot of ground sufficient in size for 8 lambs, contiguous to my turnip-field where my other lambs were feeding, was enclosed around with hurdles, or trays set double and stuffed with straw between, not only to shelter them from the winds, but also to prevent the lambs from seeing any object that would disturb them. On the north side of the yard I had a shed built, opening towards the south, and enclosed on the other three sides, for them to go under in wet and cold weather; it was kept perfectly dry, being well secured with thatch. I procured some deal boards, which were nailed to ledges about 4 or 5 inches deep to keep the boards from the ground, and sufficient space (about ¾ of an inch) left between them, so that the wet from the lambs might drain through; these were well swept clean daily, and the yard kept sufficiently littered. The lambs were fed as usual, three times a day with Swedes, cut carrots, and clover-chaff. Another lot of 8 lambs, of the same breed and about the same weight, were weighed on the same day as those put in the yard—viz., on the 7th of December—and penned in the field adjoining, which was stubble-land, and were fed with the same food exactly, and by the same person as

those in the yard; being exposed to the weather as sheep generally are, except having two or three stuffed hurdles to shelter them from the winds. On the 11th of February following, both lots were weighed again, after being at trial 9 weeks and 3 days, the result of which was as follows:—

EXPERIMENT, No. 11.

8 lambs fed in the yard gained each on the average 19½ lbs.	8 lambs in the open field gained each on the average 20½ lbs.
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This experiment proving nearly equal, I gave it up for this season; but, wishing not to be prejudiced against the practice of yard-feeding after having seen so much testimony in its favour, I tried it again the next autumn and winter, and made and enclosed a yard as nearly as possible like the one I have described, and treated the lambs just in the same manner, putting in another lot of eight lambs on the 28th of November, 1840, at the same time that they were weighed; as also penning eight more lambs, which were upon the stubble-land adjoining. Both lots had the same kind of food—Swedes, carrots, and chaff; they were attended by the same person, and managed alike, and were weighed again on the 22nd of February following, when I found the result to be as under:—

EXPERIMENT, NOV. 12.

8 lambs in the yard gained each on the average in 12 weeks 32 lbs.	8 lambs kept in the open field gained each on the average in 12 weeks 28 lbs.
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Showing in favour of yard-feeding 4 lbs. each lamb during 12 weeks. This difference is very trifling, and not in the least sufficient to compensate any one for the extra trouble and expense which must necessarily be incurred by making yards, building sheds, taking the straw to a part of the farm where perhaps the manure is not wanted, and by the heavy carriage of the turnips, which even for a short distance, is costly.*

I think another objection arises to the plan, and that is, if the sheep fed in yards during the winter are not made fat enough for the butcher in the spring, and have to be turned again to pasture, they will suffer much more from the cold winds, having been confined and kept warm in the winter, than those sheep wintered in the usual manner in the fields. It is my opinion also, but I confess I have no means of ascertaining the fact by way of experiment, that the wool may be injured by yard-feeding;

* Having formerly recommended the trial of shed-feeding, I am bound to state that in an experiment like Mr. Pawlett's, I kept ten Down lambs in a shed and ten out of doors, weighing each lot regularly; but that I found the gain of weight rather on the side of the lambs fed out of doors.—
PH. PUSEY.

for the lambs kept in that way have a more unfavourable and unhealthy appearance than those fed in the common manner. After these trials, and finding no adequate advantage in the practice, I have given up the system of feeding sheep in yards.

The advocates of yard-feeding sheep allege that they eat less food if kept in that way than others do which are fed in the open field. During the trial of these experiments no difference was observed as to the quantity of food consumed by each lot; they ate as near alike as possible, the food being carried to them in scuttles. If one lot of sheep eat less food than another, it is a proof with me that they thrive in a less degree—of course I allude to sheep of the same size and breed—as I find by weighing my sheep monthly which are kept in small lots, that those lots which eat less food (and this is often the case without any apparent cause, as they are kept in the same way), generally gain less in weight than the other lots which feed well.

Some years ago I made many experiments between feeding sheep on grass-land in winter; viz., by dividing a close of land into pens of about half an acre each, into which were put about 10 lambs, and taking the turnips and other food to them; and feeding other lambs in the field, in the usual manner, where the turnips grew. It would take up too much space to enumerate them, and as the system cannot be reduced to general practice on account of the many disadvantages arising from it and from the extra expense, I see no advantage in relating them. The result of my experience is, that sheep will thrive a little faster if fed on grass-land in winter, as described, than they will if kept on the turnip-land, but the increase of weight is of inferior importance to the extra trouble and expense incurred.

It has been my custom for some years to sow a field with tares immediately after harvest for early spring feed, upon which I usually put those lambs which I wish to get the most forward in condition as early in the spring as the season will allow me. My land being adapted to the growth of tares, particularly the farm I have lately left; by sowing them early they grew a good deal before the winter set in, so that I often have had my lambs out upon the tares as early as the middle or end of February; but I always gave them Swedes or carrots with the tares, as much as they would eat, and have found them go on, managed in this way, better than in any other system of management.

In the year 1833 I made an experiment of the feeding qualities of the red or broad clover against the white or Dutch clover; both sorts were well planted, and the white clover grew very strong. I

drew two lots of lambs on the 15th of April, and weighed them; one lot was penned upon the red clover, and the other lot was penned upon the white clover, both pens being nearly equal in size; they were weighed again on the 14th of June following, and I found they had increased in weight as follows:—

EXPERIMENT, No. 13.

Lot of lambs fed on white clover gained each on the average $36\frac{3}{4}$ lbs.	Lot of lambs fed on red clover gained each on the average $35\frac{1}{2}$ lbs.
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From this it appears that there is scarcely any difference in the feeding qualities of either sort.

The custom of early shearing sheep is becoming more general than it was a few years ago, and there is a great advantage in doing so, as I am convinced the sheep thrive much faster during the summer if their wool is taken off on the 1st day of May than if it were to be left on until the first or second week in June, as the flies will not trouble them so much upon their breasts and flanks. In some districts or situations much inconvenience as loss arises from the annoyance of these insects; and I do not know of any dressing that will keep them off, except for about two or three hours, although I have tried many of what are called preventives. Some persons are of opinion that the wool from the sheep never weighs better than if taken off in April, as soon as they leave the turnip field; but I cannot see how this can be proved, as no experiment, I think, can reach it. There does not appear to me to be any advantage in keeping the ewe-flock in their wool longer in the season than the beginning of May; if they are shorn yearly at this time there is still a twelvemonth's wool upon them; if the wool is left upon them until the hot weather, they often lose much of it from their necks and underneath, whilst some will peel entirely.

It is not my intention to treat upon the diseases of sheep generally, neither to offer any remedies (save one or two), for this simple reason, that I know of no other specifics than I can confidently recommend; therefore, I consider it much better to suppress them. It is unfortunately true that sheep are not often found to be ill until the disease has taken too deep a root to be eradicated. Various are the remedies for the very prevalent disease the foot-halt. I have tried verdigris, butyr of antimony, vitriol, and other caustics, with success; but what will effect a cure in one sheep, in a dressing or two, will not always do so in others; when that is the case, I would recommend another of the specifics described to be applied, which will, if properly attended to, remove the complaint in a few days, in most cases. Shepherds generally are afraid to probe the part affected deep enough, which ought always to be done. Whenever a sheep falls

lame in a flock, it should immediately be taken from the others, or more will fall, as there can be no doubt but the foot-halt is contagious. With respect to the recent epidemic, I am persuaded that it also is contagious, which I had sufficient proof of last season. My rams were perfectly healthy until June, when I took two of them to a certain agricultural show to compete for prizes. One of the competitors showed a sheep in the same class with one of mine, labouring at the time with the disease in question. With my ram it was turned out of the pen by the judges for their inspection, and both were some time together; the consequence was, that in about three days after mine got home, he fell ill with the complaint, all my other sheep being quite free from it that were at pasture in the same field; indeed, none of the sheep on the farm had it. In a day or two afterwards another in the same lot fell ill, and in the course of a few days about half the lot became more or less affected. About six weeks after this I had my regular show for letting rams, and had then nearly got rid of the disease, having only one sheep lame with it, for I always took one away from the others as soon as I perceived that it had got the disease. It being necessary at this time to put my sheep together, I incautiously let the infected sheep go with the others the day after the show: the rams which had been let were put into two lots; into one of them was put the lame sheep, and in a few days several more fell ill with this much to be dreaded complaint; the other lot and those unlet continued healthy.

I have given no account of expenses incurred in the trial of these experiments: I do not see how it can be done faithfully in reference to those I have given, as many were tried years ago; indeed, I cannot see how it can be ascertained what a bushel of turnips, carrots, or cabbages can be produced at, as much will depend upon the season and nature of the soil upon which they are grown. I am confident it may happen that one season I might produce, for instance, a ton of Swedes at a less price than a ton of carrots, and the next year I could produce the carrots at the least price per ton; as the season and soil might vary, and the Swedes be attacked with flies, grubs, or grape, or the carrots with what is termed here the "iron-mould." With these facts in view, I have not attempted to detail the expenses, for if they are not given accurately, they had better be left out altogether.

I believe I have stated all that is required (as far as my experience has led me) in the management of sheep, and as faithfully as I can do. I might have entered more into detail, but I thought it would be tedious and unnecessary.—Journal of the Royal Agricultural Society.

Beeston, Biggleswade.

ESSAY ON GUANO;

Describing its Properties, and the best methods of its application in Agriculture and Horticulture; with the Value of Importations from different localities; founded on actual analyses, and on personal experiments upon numerous kinds of Trees, Vegetables, Flowers, and Insects, in this climate.

BY I. E. TESCHEMACIER, BOSTON, MASSACHUSETTS.

PREFACE.

Manure is the staff, the chief dependance, of the farmer. The first action in the examination of a farm should be to observe the system of the farmer's management of his manure; from this alone a pretty good idea of the management of the rest of his affairs may be gathered. Without a proper understanding on this subject, it is impossible for him to excel in his cattle or his crops. Knowledge on the matter of manure is therefore of the greatest importance to him; and ignorance of it is what he ought to be most ashamed of. A person may travel thirty or forty miles from Boston, in some directions, and not find one fiftieth part of the land on each side of the road well cultivated; while in other parts, he would find acres from which is gathered annually from two to six hundred dollars of produce. This difference chiefly arises from application of the article of manure, the deficiency of which is probably the chief cause of the sterility in question.

It certainly appears rather singular that so much prejudice should be entertained against a manure like guano, backed as its efficacy has been by centuries of experience in South America, and by an immensely increasing consumption in England, where the utmost attention is of necessity paid to increase the produce of the land.

It is true, the greatest objections have been made by those who have never tried it. One is afraid the production of luxuriant crops every year will exhaust his land; as if it were desirable to have diminutive crops, and let the virtue remain in the soil. Another will have it that this country is too hot, and has not the damp advantages of England; forgetting that South America is hotter still. A third, having applied an exorbitant quantity, against every instruction given, and thereby killed his crop, is unwilling to try again with a more economical distribution of it.

I have now experimented with this article for three years, and the number of my experiments have been nearly two hundred. With the exception of those on a few exotic plants of peculiar constitution, and also of those where I have pushed the application purposely to excess, in order to test its power, few of these experiments have failed.

This pamphlet will therefore contain chiefly the results of my own experience; and, with those plants on which I have not tried the effect, I shall give my views of the best mode of applying this manure. And here I beg to observe that, having from my youth been practically acquainted with the operations and refinements of horticulture, and knowing well that experiments on this subject are liable to error when confided to unpractised hands, I have myself performed every part of nearly all the experiments, including the whole cultivation, which I give as my own, and have carefully watched and noted the various appearances they have offered at different periods of the applications.

During many months employed in chemical research on this subject, I have analyzed thirty or forty specimens from various localities. I am not at all surprised, therefore, at the very erroneous views taken of this manure by many professed chemists; so complex and varied is its constitution and the form of its ingredients; so numerous are the transformations they undergo. The analysis by exposure to heat gives only a true idea of the quantity of potash and soda, of the salts of lime, and magnesia; but of the most important ingredients, by this method, no correct notion can be formed. The conversion of the oxalates and the animal matter into their gaseous constituents, and the action thereof during this operation, entirely mask and confound the other substances; and, unless the drying, to ascertain the moisture, be very carefully conducted, part of the ammonia escapes, and is calculated as moisture. With all the efforts to obtain a true estimate of the ammonia, unless the experiment be very attentively managed, the humic acid, &c., will still obstinately retain a portion. Many other difficult points remain, such as the detection of urea and uric acid, and the various combinations of the ingredients. The investigation of these is calculated to call forth all the resources and energy of the chemist; and, although the decision of many of them is not essential to the agriculturist, they are of high interest to the man of science. In my later investigations, I have received much valuable assistance from Richard Soule, Junr., formerly pupil of Dr. C. T. Jackson.

Following the example of those whom I consider the best analysts, I have endeavoured, in the analyses made for agricultural purposes, not to make too many subdivisions, particularly when the quantity of an ingredient is small; they only perplex those whose object is practical utility.

The classification according to the agricultural importance is more easily understood, and bears a more true relation to the market value than any other, and, for all purposes of seller, buyer, and user, is therefore the best.

It has been thought that the supply of this article will soon be exhausted. That it will be exhausted I have but little doubt. If, however, the reports of travellers can be credited, and there is no reason why they should not, deposits are to be found of two hundred to three hundred feet in depth, extending many leagues along the coast of Peru. Such a mass will bear several years' consumption.

If a farmer should use guano for several successive years, he might store up his annual collection of manure, which, with proper covering and care, would retain its virtues just as guano does, and become a valuable capital for him to draw upon when the scarcity of guano rendered the price too high for economical use. And, at all events, the discussions to which its powers and action have given rise have rendered services to agriculture which can never be too highly valued.

In conclusion, I have been actuated, in my investigations of this manure, in my earnest endeavours to promote its introduction into this country, and in this present attempt to disseminate information on the best methods of applying it, simply by the hope of doing some service in my generation; and it will be a source of much gratification to me if I can reflect that I have in any way promoted the progress of that most useful, that most honourable employment of man—agriculture.

GUANO.

This substance, which has been used in South America as a manure for many centuries, retains there its Peruvian appellation of *huano*. The Spaniards, not having an aspirate *h* in their language, replaced it by a *g*, the nearest sound to a guttural aspiration their alphabet possesses. Hence *guano*, pronounced by a Spaniard, is in sound more like the Peruvian *huano* than any thing else, and quite different from our *guano* with a hard *g*. It is unquestionably the dung of sea-birds, which have for ages used the spots where it is deposited as places of resort during incubation.

The soil to which it is applied in South America, principally for the growth of maize, is of a sandy,

sterile nature, containing but little organic mixture. Each crop has usually three applications of guano; the first, in small quantity, at the time of sowing the seed; the second, a larger application, when the plant is less than half grown; and the third, just previous to the commencement of ripening the seed. After each application, the land is irrigated—that is, watered. From this latter circumstance, it will be seen that the first application is of the nature of a steep in guano liquor, which, no doubt, accelerates the germination of the seed, while the dilution of the guano prevents the embryo from being injured by the action of the manure, and also causes the commencement of its decomposition, rendering it immediately available to the growth of the young plant. The volatile ammoniacal salts of the first application being exhausted, the second becomes necessary for the increased roots forming; and this, no doubt, enters largely into the substance of the plant, promoting in every way its growth, luxuriance, and production of seed. Of the benefit of the third application, I confess I am unable to judge; never having tried it, because I was unable to see beforehand the use of it. Nevertheless, I think that the common practice of a people who have used guano for centuries should not be slightly rejected without experiment, and it certainly shall be tried.

It would be a folly, at the present moment, to doubt the immense value of this powerful manure, when so many have witnessed the surprising effects it has produced; but it is certain that fraudulent adulterations, as well as improper applications of it, have produced failures in many cases. To those, however, who may yet be inclined to skepticism on the subject, it may be well to observe, that a single, well-conducted, and faithful application of guano, which has been crowned with success—and there are hundreds on record, *beyond all dispute*—must completely prove its beneficial effect; while a hundred failures can only prove error in its application, or fraud in the article. But it is fortunate for agriculture that, within the last seven or eight years, science has taken up so vigorously the investigation of the laws of vegetable life, and, independent of any considerations on guano, has arrived at conclusions which enable it to prove and exhibit, in the clearest manner, the causes and reasons for this valuable action on plants, thus not only placing it beyond the region of doubt, but also affording valuable hints respecting the methods of the application to the various members of the vegetable kingdom. It is to these methods of application that I shall chiefly devote this pamphlet. But I wish, in order to be better understood, first to enter into the discussion of the aptitude of its ingredients to the growth of vegetables, as well as of

the different qualities of this manure brought from different localities, holding all knowledge on this interesting subject too valuable to be kept at home. It is, like the manure itself, the more beneficial the more it is spread abroad.

We are told truly, that the volatile parts of vegetation consist of

Carbon, obtained by plants chiefly from the soil and atmosphere;

Oxygen, } obtained by plants chiefly from
Hydrogen, } water, carbonic acid, &c.;

Nitrogen, obtained by plants chiefly from manure, and also from rain and snow;

besides which, they contain fixed or non-volatile inorganic ingredients, chiefly

Silicium, in combination with oxygen, called *silica*, or sand;

Lime, in combination with phosphoric and other acids;

Potash and soda, in combination with acids;

Magnesia, in combination with acids;

and various oxides of metals, the presence of which, however, is not very important, as they exist in exceedingly small quantities.

Now, without going any further into scientific discussions, which are not so interesting to the practical agriculturist at present as I trust they will be some years hence, it is enough to prove that all these ingredients, with the exception of the metallic oxides, exist in guano.

The ingredients of guano are as follows:—

Ammonia (formed of nitrogen and hydrogen), combined with carbonic, oxalic, phosphoric, and other acids.

Lime, combined with phosphoric, oxalic, and other acids.

Potash and soda, combined with muriatic and sulphuric acids.

Magnesia, combined with phosphoric and other acids.

Animal organic matter, containing carbon, and also nitrogen.

According to the latest and most accurate analyses of plants, maize, (or Indian corn) contains in the ashes of its seeds—

Phosphoric acid	. . .	about 50 per cent.
Potash and soda	. . .	30 “ “
Magnesia	. . .	17 “ “
Lime	. . .	1½ “ “
Silica	. . .	1 “ “

The kind of corn is not named in this analysis.

Wheat ashes contain—

Phosphoric acid	. . .	46 to 50 per cent.
Potash and soda	. . .	34 to 37 “ “
Magnesia	. . .	9 to 16 “ “
Lime	. . .	2 to 4 “ “
Silica	. . .	½ to 1½ “ “

with a little peroxide of iron and sulphuric acid.

The difference exhibited here in the quantities of the ingredients arises, probably, from the difference of soil in which the analyzed seeds were sown.

A most interesting question to be hereafter decided by chemists and agriculturists is, to a preponderance in which of these ingredients does grain owe its most valuable and nutritious qualities, *as well as flavour?*

Rye ashes contain—

Phosphoric acid	. . .	47 to 52 per cent.
Potash and soda	. . .	30 to 37 “ “
Magnesia	. . .	10 to 10½ “ “
Lime	. . .	3 to 7 “ “
Silica	. . .	½ to ¾ “ “

with a little peroxide of iron and sulphuric acid.

Barley ashes contain—

Phosphoric acid	. . .	about 41 per cent.
Potash and soda	. . .	20½ “ “
Magnesia	. . .	10 “ “
Lime	. . .	3½ “ “
Peroxide of iron	. . .	2 “ “
Silica	. . .	22 “ “

The quantity of silica is remarkable.

Buckwheat ashes contain—

Phosphoric acid	. . .	about 50 per cent.
Potash and soda	. . .	29 “ “
Lime	. . .	7 “ “
Magnesia	. . .	10½ “ “
Sulphuric	. . .	2 “ “

and a little peroxide of iron and silica.

Turnip-seed ashes contain—

Phosphoric acid	. . .	about 42 per cent.
Potash and soda	. . .	26½ “ “
Lime	. . .	14½ “ “
Magnesia	. . .	12 “ “
Oxide of iron	. . .	3 “ “
Silica	. . .	1½ “ “

Silver-fir ashes of seed contain—

Phosphoric acid	. . .	about 40 per cent.
Potash and soda	. . .	24½ “ “
Lime	. . .	1½ “ “
Magnesia	. . .	17 “ “
Sulphuric acid	. . .	12 “ “

with some peroxide of iron and silica.

I have given this analysis, from the curious fact that the pollen of many of the fir tribe, clouds of which may be seen in the forests at the proper season, contains a large proportion of phosphate of lime. This must be extracted from the disintegrated rocks on which the pine often grows—a circumstance which led me to judge that, as guano contained much phosphate of lime, it would be well adapted to promote the luxuriant growth of this tree; and my experiments on young trees fully confirm this surmise.

Ashes of peas contain—

Phosphoric acid	. . .	31 to 34 per cent.
Potash and soda	. . .	39 to 47 “ “
Lime	. . .	2½ to 10? “ “
Magnesia	. . .	6½ to 12? “ “
Sulphuric acid	. . .	3½ to 5 “ “
Chlorine, or chlor. sodium	1 to 3½	“ “

with small quantities of silica and peroxide of iron. These, it will be seen, are the fixed non-volatile ingredients of plants. All of them are found as constituents of guano, which contains, besides ammonia, or nitrogen, the only volatile ingredient required from manure; the other three—oxygen, hydrogen, and carbon—being obtained in sufficient abundance from the soil, the atmosphere, and from water.

It would be useless to add further to this list; enough have been enumerated to give a general idea of what is necessary for their growth, and also to show that all the ingredients of plants are found in guano. Putting guano into the soil, therefore, as a manure, is clearly restoring to the earth those substances which plants abstract from it, and which are absolutely necessary for their growth.

Now, the questions remain as to quantity, cost, and mode of application. This last is of the utmost importance, as guano is a very concentrated, strong manure. Too much would be more injurious than none at all.

From what precedes, it is beyond dispute that guano contains the chief ingredients required for the growth of plants. The instances hereafter adduced will show that the combination and form of these ingredients are such as to promote not only its immediate action, but clearly to accelerate considerably the progress of vegetation. One of the numerous objections to this manure is, that, although it may answer well in the humid atmosphere of England, it cannot produce equal benefit in the hot, sandy soils of this country. In reply to this, it may be observed that the sandy soils of South America are more hot than they are here; and, on the coast of Peru, where it is most used, it scarcely ever rains at all. The truth is, that it certainly requires moisture to decompose it, and enable it to enter into the juices of the plant; by no means, however, so much as is usually supposed; but, once absorbed by the roots of the plants, it imparts that strength and solidity which enable them to resist both drought and cold.

As many of my experiments were made with guano from different localities, I will, at this point, give the most approved analyses; taking those which, having been made by Dr. Ure, my brother, and myself, for agricultural purposes, will be more simple and intelligible to agriculturists, as well as best adapted to illustrate the information I wish to convey.

ANALYSES OF GUANO.

In the discussion of these analyses, my observations will be chiefly confined to the agricultural value of the various ingredients, without at all entering into the scientific questions which must

arise in the mind of every chemist who has studied this chemically-complex and intricate substance.

The chief ingredients, then, of guano are—

- Ammonia, in various forms and combinations
- Phosphate and oxalate of lime and magnesia
- Salts of potash and soda
- Animal organic matter
- Sand and moisture.

Let us consider their separate agricultural value.

1. *Phosphate of Lime*.—This is a valuable and indispensable ingredient in soils; but it is the same as bone manure, or bone-dust, except that in guano it is in a finer powder or state of division than can be in any way artificially produced; and hence it acts powerfully and immediately. Many soils, particularly those with a large admixture of disintegrated granite,* contain naturally a considerable quantity of this substance—enough to supply the crops of many years of corn and other vegetables—in which a reference to the foregoing pages will show it to be a necessary portion. In such soils it is therefore of little comparative virtue. In other soils, particularly those which are poor and sandy, it is a beneficial and necessary addition; but alone it would be of little use, and in quantity even very injurious, being of a hot nature, as will have been experienced by many who have used bone manure injudiciously in their efforts to produce luxuriant vegetation, and have burnt up their plants. Phosphate of lime, in the shape of crushed bones, can be obtained at a cheaper rate, when required, than it can be purchased in guano. Notwithstanding these remarks, in combination with the other ingredients of guano, it becomes, in most soils, of considerable advantage. It is insoluble in water.

2. *Magnesia* is already found, in most earths, in sufficient quantity for the small demands made upon it by vegetation.

3. The *Salts of Potash and Soda* are valuable, but might also be obtained cheaper from leys and other sources, to supply what is taken off by the crops.

4. The *Sand* is evidently of little value, except in clay soils.

5. The *Oxalates* are of little known general value as manure.

It must not, however, be imagined that these substances are of no value in the guano: quite the contrary. I am, above, only alluding to their separate values in any soil. For it may be easily conceived that, if all the materials necessary for

* Some very recent and interesting experiments seem to prove that phosphoric acid exists in many more rocks and minerals than has been hitherto supposed.

the growth and perfection of a plant be presented to the roots together, the growth may be more rapid, equal, and luxuriant, and the produce more certain and larger, than if the roots had to search for each ingredient required, with the uncertainty of finding them either within their reach or in a state bringing them under the control of their powers; in which state they exist in guano.

The feeding or absorption by the roots of plants, with their faculties of abstracting, in a liquid form, substances insoluble in water and in many of the chemists' liquids, is a subject on which vegetable physiology has as yet shed but little true light. The above is therefore only an idea suggested by the visible operation of this manure, and by observations on its action at various periods of growth.

There remain, then, only the *Animal Matter* and the *Ammonia* to be considered, as the most important ingredients. The organic animal matter, as will be seen, is not in very large proportion; but what there is, is valuable: in the Peruvian and Bolivian guano it is already combined with ammonia, and in the others much of it is resolvable into this substance.

6. *Ammonia*.—According to the best vegetable physiologists, nitrogen (or azote), the chief constituent of ammonia, exists in all parts of plants; and it is in the form of ammonia that it enters them. It seems to be the great agent in stimulating the increase and propagation of all the vessels in the plant. Hence, with an ample supply of this substance, combined with other necessary materials, Nature can push her development of root, stem, leaf, flower, seed-vessel, and seed, to its farthest extent. Ammonia, therefore, in some shape or combination, must be necessary in any manure destined to produce luxuriant growth; and it is the most valuable ingredient in guano, the mercantile worth of which is regulated principally by the quantity it contains of this substance.

In some of its combinations, however, it is more volatile—that is, evaporable in the atmosphere at common temperatures—than in others. That in the South American guano is less volatile than that in the Ichaboe and other African localities. This is owing partly to the Ichaboe being mixed with a portion of the remains of dead animals, partly from being the manure of the penguin as well as of the albatross tribe, and also partly from its being a more recent accumulation, and not having lain long enough to undergo the same decomposition as the South American. This last contains what Dr. Ure has named *potential ammonia*, which means simply this substance in a more permanent form, and is, in this state, contained in the animal matter and in the uric acid, which latter is in extremely small quantity, if at all, in the Ichaboe

guano. Humate of ammonia is also a very permanent form, and this likewise exists in guano.

Some from Saldanha Bay, which I have analyzed, seems to have undergone the same decomposition as the South American, although the rain which prevails there has washed out a large proportion of the ammoniacal salts; it also contains, like that, a portion of uric acid, but not nearly so much.

To choose guano, then, regard must first be had to the quantity of ammonia; and it is preferable when in the most permanent form: such is the Peruvian. The moisture is next to be considered—first, because it is water, and nothing else; and, secondly, because moisture aids the decomposition and volatilization of the different ammoniacal ingredients, which is not desirable until the guano is in the soil. It should also be pretty free from foreign substances, such as dirt, sand, sticks, skin, stones, &c. The Peruvian and the true Bolivian are the best; after these, the first quality from Ichaboe, such as the cargo per "Samos"; then the second quality from Ichaboe, and that from Saldanha Bay. These are the only localities from whence cargoes have been hitherto introduced here. The Chilian is quite inferior, and generally contains only eight to twelve per cent. ammoniacal salts. Numerous vessels from Europe are now searching in every probable place in the world for this manure. I trust and believe they will be successful. I purposely omit all reference to adulteration, as I think it has not yet been practised here to any extent; and the only caution I can give is, to request those who purchase to apply to men whose characters are above all suspicion of fraud and dishonesty. There are many such in the trade.

Guano from South America.—The guano from Peru is the dung of birds of the albatross tribe, who have for ages covered the islands on this coast in countless thousands, during the time of their annual incubation, and have consequently formed immense deposits of this valuable manure. As it never rains on this part of the coast, the hot sun, with the dew, soon forms a crust over the newly-made annual deposit. Under this, a close species of decomposition and concentration takes place; and, the escape of ammoniacal gas being prevented, it becomes condensed into the other ingredients, and, finally, after various probable, although not well understood, transmutations, exists in its most permanent form, and in great quantity.

The guano from this part of the coast is, therefore, the most valuable of any for agricultural purposes, particularly for spreading broadcast, or where it is in any way exposed to the action of heat or atmosphere.

Under circumstances of exposure which would deprive the Ichaboe guano of a great portion of its

ammonia, the Peruvian would retain the chief part. This must be borne in mind in its application.

The best analyses of Peruvian guano give, as ingredients—

33 to 40	per cent. of ammoniacal salts ;
5 to 7	„ animal matter ;
8 to 12	„ salts of potash and soda ;
23 to 28	„ phosphate of lime and magnesia, and oxalate of lime ;
10 to 13	„ water ;
	with a little sand.

This guano contains from seven to twelve per cent. of uric acid ; and this, as before mentioned, forms an important part of its value. The Bolivian guano is next in value to the Peruvian. It contains about three per cent. of uric acid. Analysis gives—

About 36	per cent. of ammoniacal salts ;
„ 5	„ animal organic matter ;
„ 16	„ salts of potash and soda ;
„ 28	„ phosphate of lime and magnesia, and oxalate of lime ;
„ 14	„ water.

The Chilian guano is the most inferior of all those from South America, and contains no uric acid. Analysis gives—

About 12	per cent. of ammoniacal salts ;
„ 3	„ animal matter ;
„ 8	„ salts of soda and potash ;
„ 53	„ phosphate of lime and magnesia, and oxalate of lime ;
„ 22	„ water ;
„ 2	„ sand.

African Guanoes.—Of those from the coast of Africa, the best is unquestionably that first brought from Ichaboe—a deposit now unfortunately exhausted. But it does not contain uric acid. The best analyses give, as ingredients—

23 to 28	per cent. of ammoniacal salts ;
5 to 9	„ animal organic matter ;
9 to 11	„ salts of potash and soda ;
30 to 37	„ phosphate of lime and magnesia, and oxalate of lime ;
18 to 25	„ water.

The ammoniacal salts here are in a much more volatile and soluble form than in the South American sorts, and therefore, in the application, it should be quickly covered up with soil ; the ammonia then—as the guano decomposes by heat, moisture, &c.—combines with the constituents of the soil, and takes a more permanent form, so that but little is lost.

The refuse African guano from Ichaboe, that from Pedestal Point, Algoa Bay, some from Angra de Pequena, Possession Island, &c., are much inferior to the above, and vary from ten to twenty per cent. of ammoniacal salts ; the other ingredients increase in proportion to this deficiency. It is pro-

bable that a large proportion of the valuable salts have been washed out from these by rain. I have, however analyzed, a guano from Saldanha Bay, which, although by no means so rich in ammoniacal salts as that from Ichaboe, seems to have lain long enough to undergo the same decomposition as the South American guano, and to contain some ammonia in its most permanent form, with uric acid. Here, as before stated, the rain has also washed out much of the valuable ingredients, which is probably the reason why it contains so much less ammonia than that from South America, or rather from Peru. Vessels have gone to endeavour to find these washed out ammoniacal salts, and, if they succeed, will probably bring home valuable cargoes.

It will be seen, therefore, that guano varies as much as other manure, and that the reports of experiments on guano, without a perfect knowledge of the kind, and the exact method of application, convey no valuable information, give no rule which it would be safe for the farmer to follow.

If that from Ichaboe be spread broadcast on the surface, and no rain follow immediately, the ammonia will evaporate, and the effect be altogether trifling ; whereas, the same quantity under the surface, where this ammonia could be absorbed by the soil, and from this given off to the roots, would produce immense benefit ; while that from Peru would comparatively lose little by the former method of spreading broadcast. For using in solutions in water, I rather prefer the best Ichaboe to the Peruvian, nearly the whole of the ammoniacal salts of the former being soluble ; but, for using the whole substance, that from Peru is decidedly more permanent in its effects.

The best agricultural method of making an analysis of guano is, first to ascertain the quantity of moisture in one hundred parts, then to ascertain with exactness the quantity of ammonia they contain. The next operation is to see how much is soluble in water. This will give chiefly the salts of potash and soda. The ammoniacal salts, being known already, are burned off ; the potash and soda remain behind. There are still left those portions insoluble in water. Such are the phosphate and oxalate of lime, and phosphate of magnesia, the sand, and the organic animal matter. These, although insoluble in water, are more or less decomposable by the action of the plant and the matters found in the soil ; and, being in a state of extremely fine division, this action is quick and immediately serviceable to the plant. They are chemically discoverable by solution in acids, and precipitation by the usual tests.

Uric acid may be discovered and estimated, as stated by Dr. Ure, by treatment with a weak solu-

tion of borax, and precipitation by hydrochloric acid; and, for urea, by boiling the residue left after solution by boiling water, in a very strong alcohol, in a thick flask.

The whole of these operations require extreme care and patience to give satisfactory results, and should always be done in duplicate.

I now proceed to give the result of my experiments.

APPLICATION OF GUANO IN CULTIVATION.

Zea Mais, or Indian Corn; the variety called Sweet Corn.—Several hills were planted on a poor, sandy, sterile soil. First application, one teaspoonful South American guano, well mixed with the soil when sown. Second, when twelve to fifteen inches high, the earth was drawn away from around the hill, and about three teaspoonfuls strewed in the circle, which was immediately covered up again. This application was made at least five to six inches from the base of the stem, and the trench, by the hoe, from three to four inches in breadth, and one and a-half to two inches deep. After this application, water was profusely given, as the weather was dry.

The corn from this experiment was exhibited in the rooms of the Massachusetts Horticultural Society. The produce of one seed was three chief stems, bearing eight perfect heads and five suckers, each showing the silk (the mass of pistils of the fertile heads), and weighed, the roots being cut off, eight and a quarter pounds. The best plant from several adjacent hills without guano had only one head, and weighed under the same circumstances, one pound and a quarter. I have since tried several applications with this plant, and find the best method as follows:—

Hollow out the hill, put in one teaspoonful and a-half of guano, and mix it well with the soil. Spread even, then put on this about one or one and a-half inch depth of light soil, on which sow the seed, and cover up. When the corn is about twelve inches high, or the time of first hoeing, begin with the hoe about four inches from the stems, and make the trench the width of the hoe, about two or three inches deep. Spread in this trench about three or four teaspoonfuls guano, stir it in, and cover the trench as quickly as possible. If this last operation can be performed just before or during rain, the action will be quicker and more effective.

* * * * *

Some farmers have thought best to mix guano with other substances, such as manure, muck, ashes, loam, &c., previous to spreading it on the land. On this point, my opinion is, that it is by far preferable to crush the lumps, and use guano by itself,

or, if it must be mixed, only to use sand, or dry, sandy loam. The chief reason for this is, that stirring it about, in mixing, exposes the ammonia to be lost by evaporation in the air. This is, however, more the case with the African than the Peruvian, still even to a considerable extent with the latter. Muck is too moist and tenacious to enable it to be properly disseminated amongst the mass. Therefore, whenever any quantity is together, it would injure the sprouting seed; and moisture immediately causes guano to undergo the very decomposition which is required to promote vegetation; therefore, this ought not to be produced until it is in the vicinity of the plant or seed. Ashes of wood contain the very alkalies which the chemist uses in his analyses to separate the ammonia. He also uses lime for this purpose. Therefore ashes, or any substance containing lime, must be an improper mixture; they would quickly drive off this the most valuable part of the guano.

The object of the farmer should be to place his guano in such a situation that, when its decomposition commences, the soil should absorb the products of this action, and that soil be in the immediate neighbourhood of the roots of the plant to be manured—they will speedily find it out of their own accord.

Manure, except when dry—and then it is not very valuable—is open to the same objection as muck; besides which, if guano alone will give an excellent crop, why throw away the manure?

Light, dry loam, and sand, are not objectionable. The latter is highly to be recommended on a clay soil, where the action of the guano is evidently much impeded.

Grass and Grass Land.—The application of this manure to grass land already down is, for many reasons, often attended with uncertain results. The best mode is, to spread broadcast about two hundred and fifty pounds per acre of the Peruvian guano as soon as the snow is off the ground. It would be very advantageous if, after it was spread on, some light loam could be put over it, in the manner of a top-dressing. I state the Peruvian guano is the best for this operation, as it contains what Dr. Ure calls *potential ammonia*, or ammonia in a more permanent form; whereas the ammonia from the Ichahoe guano evaporates more easily, and this valuable ingredient is therefore lost in the atmosphere when it is spread on the surface. I have already mentioned this previously, but purposely repeat it here. Most excellent crops have been obtained, where the grass is sown and laid down in the autumn, on light, sandy soils, by sowing the guano evenly broadcast, then harrowing twice, sowing the grass seed, and rolling. But in this, as in every case where guano should be applied broadcast, it

seems to me that the most efficacious method would be to strew a quantity in the furrow made by the plough; the soil raised of the next furrow will then lap over and cover it up. A very small quantity, say certainly not exceeding one hundred pounds to the acre, may then be sown broadcast on the surface, and harrowed in with the seed, in order, like a steep, to promote the luxuriance of the early growth of the plant. When the roots have attained a greater strength, they will then come in contact with that buried under the furrow, which, by the time it is wanted, will have become thoroughly decomposed in the soil, and be exactly fitted to the wants of the plant.

In several cases, where sods have been laid down for lawns or embankments round houses, the most surprising growth has been obtained by strewing the surface with guano previous to laying on the sod. The manure is then brought into contact with the roots, which being strong and old—not tender and young, like the sprout and root of a seed—take immediate hold, and this effect is produced without injury.

I will here state that, on light lands, I consider three hundred pounds Peruvian guano to the acre quite sufficient; if Ichaboe, about one fourth more; and others according to the per centage of ammonia.

E. Baylies, Esq., of Taunton, sowed four hundred and sixty pounds of African guano (per ship Samos) per acre with grass seed, which yielded, this year, one ton per acre more than that without; and the appearance of the guanoed grass is now much more thick, luxuriant, and promising, for next year, than the other.

It is scarcely necessary to add that I consider wheat, barley, oats, rye, &c., as grasses, and these methods of application to be most rational, and give the most probable prospect of success. Every farmer, however, must reflect a little on the nature of his soil. I can, of course, only give general directions, and exhibit the nature of the action of this manure. A man of any judgment, then, can hardly fail.

In the treatment of bush beans, a few pages hence, I state a fact respecting the flavour. I will here mention, relating to the same subject, that two cases are reported, in English papers, where the birds selected the fields of the guanoed wheat in preference to those manured, nearly eating up the first, and leaving the latter untouched; also, that I have the testimony of several friends, that their vegetables grown with guano were superior in flavour to any before tasted; and this entirely coincides with the whole of my own observations.

Grape Vines.—Here my individual experience is small, having only planted two vines, last autumn,

manured with guano, which are growing vigorously. But many others have tried it on them with the greatest possible success, both as to growth of stem and fruit. This plant is a gross feeder, and will bear a great quantity of this manure without injury. Vines grown in pots will make a surprising growth if watered with a solution of guano; but, for the reasons given under the head of Indian corn, I think that the guano itself, containing the phosphate of lime, will give greater and better produce. The well-known success of others with this plant renders any evidence from me unnecessary. The best method of application is the same as for trees, which follows.

Trees.—The experiments with guano on trees, which have come under my observation, including exotics, number about one hundred and fifty. The action has invariably been to produce large foliage, of a deep, healthy green, or with plants, usually covered with a white powder, called *glaucous*, to increase this appearance, and to shorten the joints or intervals from leaf to leaf. This last action, as respects fruit-trees, is of the utmost importance; every one being aware that long-drawn, long-jointed shoots are the least valuable or productive, and that the fruit-bearing spurs on trees are but branches with shortened joints. Hence the production of short-jointed, stocky branches is the production of so much fruitful wood; and if, by proper pruning, the sun and air are admitted so as to ripen the wood, a plentiful crop must be the result.

The best mode of application to fruit-trees seems to be, first, to consider where are the young feeding roots—that is, at what distance from the stem, and what depth in the ground—then to place the guano as near them and as much around them as possible, without being in absolute contact.

For instance, round an apple-tree of ten years' standing, dig a trench, one or one and a half foot deep, at about the same distance from the stem that the branches extend; let this trench be about one foot wide; then put at the bottom one and a half inch depth of guano, dig it well in, and incorporate it with the soil; then cover up carefully, and press the earth down. The effect of this application will unquestionably be felt for several years.

I am rather inclined to attribute this shortening of the joints chiefly to the action of the soluble portions of the guano; as the pelargonium, the orange, and many other plants which exhibited this appearance, had only been watered with its solution. But, in all applications to fruit-trees, I recommend the guano itself, as the insoluble portion contains the chief materials of the seed, to protect and cover which fruit is formed. Where young trees are to be manured, a little guano, dug in at

the surface around the tree, as well as in a trench, will be advantageous.

The use of guano for trees probably combines another advantage of inestimable value; this is, the destruction of the insect tribe which are buried in the earth, and emerge from thence with the warmth of spring. The coverings of these insects, when they first come out of the ground, are not hardened; and, in this tender state, the contact with a moderately strong solution destroys them. I have tried experiments on about eight or ten various caterpillars, and some other insects, and have invariably found a solution of guano kill them quickly, except when in an advanced state; then it took a longer time and a stronger solution. Salt and oil-soap are both apt to be injurious to vegetation; but, by strewing guano around the trees, and turning it in a little depth, the plant will be benefited, and the insects at the same time destroyed. My experiments on this subject, although perfectly convincing and satisfactory to myself, have, for want of time, not been conducted with that care and precision which should authorize me to lay them before the public with requisite confidence. My last experiment was with the destructive grub *melolontha*, so well known to subsist on the roots of grass, of which a friend kindly sent me a box. Six of these white grubs were placed in a saucer half full of water, in which a teaspoonful of African guano had been put and well stirred. They immediately began to feel uneasy, and, in about two hours, the whole six were dead.

Several friends, who have tried guano this year on their pear-trees, have reported to me the result to be greater crops; and of a much larger size, than they ever had previously. The improvement of the flavour of fruit is an experiment yet to be tried on an extensive scale, previous to a final determination of this important question.

Peas.—The kinds on which I experimented were Prince Albert, Shilling's early grotto (a dwarf pea), blue imperial, and marrowfat.

The method I adopted with all was to draw a deep trench with a hoe, to strew guano in the trench, mix it up with the soil, over this put about one inch and a half of earth, then sow the seed, and cover up. In this way, I calculated that the young sprouts of the seed, both root and embryo, could not be injured by coming into immediate contact with the guano, and that, when the roots were strong enough to bear it, they would find the guano in that state of decomposition best suited for them. The quantity used was about three pints of Ichaboe guano to a quart of seed; sown, however, much thicker than is customary here. It will be observed that, in this case, the natural moisture of the soil, at the depth at which the guano was placed,

was sufficient to bring it to a proper state of solution, and rendered the necessity of immediate rain not of so much consequence. When rain did come, it was beautiful to see the luxuriance resulting, and I felt persuaded that none of the virtue of the guano had escaped at the surface. The produce of the first three kinds of pea was five full pecks to the quart of seed, besides a full quart of seed gathered for next year. From the marrowfats I obtained only four pecks and a half, and no seed. The growth of all was extremely luxuriant. The marrowfats were six and a half feet high, the stems from one to one and a quarter inch in circumference. On the blue imperials, almost every flower bore fruit. On a stem thirteen inches high there were twenty-two pods. This was not at all uncommon, and such was the specimen I exhibited this year at the room of the Massachusetts Horticultural Society. Many pods of the crop contained nine or ten peas; these would be valuable for seed. I also exhibited very luxuriant specimens of Shilling's early grotto in the same hall. The joints, or distance from leaf to leaf, was very much shortened—an effect of guano which has been remarked on in its application to fruit trees.

I have previously observed that rain was not so absolutely necessary as is supposed. It will be seen that, in this experiment with the pea, the guano was placed at such a depth that the natural moisture of the earth decomposed it, and rendered it fit for the plant. It is seldom that drought penetrates so deep as this into the soil; therefore, if the application be made judiciously, dependent on the nature of the soil, and if its capacity for retaining moisture be considered, the want of rain is not so fatal an objection to the use of guano as might be thought. Thus, for instance, in the lightest soils, plough and bury guano a little deeper than in others more heavy; the guano itself retains moisture, and absorbs it naturally.

China Bush Bean.—A row was sown on each side of my garden-walk. One was partially shaded from the hot sun. This was tried without guano. To the other, fully exposed to the sun, guano was applied in the same way as with the peas. The guanoed row bore nearly twice as many beans as the other; and, while that was turning yellow with partial exposure to the heat of the sun, this, exposed to its full influence, remained green and unscorched. Between the produce of these two rows a marked difference in flavour was observed by myself and family, although the latter were not aware of the difference in their cultivation. I need scarcely add, that those with guano were of the most agreeable taste.

In this experiment, particularly, the stability given to the plant, and its power to resist the heat

of the sun, compared with the other, are remarkable. This was evidently also the case with the peas. There were, with these, however, no unguanoed rows to institute a parallel, but only those in neighbouring gardens. A friend of mine sowed grass, last autumn, in the sandy soil near Taunton, with a full quantity of manure, and an adjoining acre, as an experiment, with four hundred pounds of Ichaboe guano. The guanoed acre grew stronger, and retained its full verdure the whole winter; the manured piece, on the contrary, became, as usual, brown by the action of the frost.

From these and several other experiments reported to me, it seems clear that this manure gives a stability and strength to vegetation which enable it better to resist both cold and heat, as well as drought, than when the usual manure is employed.

Melons.—The two kinds tried were the green-fleshed cantaloupe, and some seeds which I received as the sweet melon of Ispahan. They were both steeped in guano water, and raised in a parlour. At the proper season, they were planted out on poor soil, with the addition of three teaspoonfuls of African guano to the hill, and afterwards occasionally watered with a weak solution. On two plants of the Ispahan I had five fruit, two of a good size. They are all now (September 16th) nearly ripe, being quite yellow. On the one plant of the cantaloupe there was only one fruit, and that not very large. It is naturally a shy bearer, and was unfortunately placed by accident in a very shady part of the garden. I do not think the fruit will ripen. The roots of melons, squashes, cucumbers, and most of the cucurbitaceous tribe, spread about at very little depth from the surface of the ground—a circumstance which must be taken into consideration in the application of guano; and, generally speaking a knowledge of the natural growth of the roots is necessary to decide on the best method of using this manure. This is so evident, that nothing further need be said on the subject.

Potatoes.—I have not made any experiment, but must refer, in this case, to numerous experiments of others, which are detailed in various agricultural publications. Nearly all the comparative experiments I have read on this tuber are certainly in favour of the guano. By attending to the observations respecting the roots, in various pages of this essay, no difficulty can be experienced in the method of application.

E. Baylies, Esq., of Taunton, has kindly furnished me with the following result of his experiment on potatoes:—

Soil, very sandy and light; quantity, eight hundred pounds African (per ship Samos) to the acre; cost, twenty dollars. Same soil, with twenty-two loads fine compost manure, cost twenty-two dollars.

Yield, as eleven to nine, or twenty-two per cent. in favour of guano, the potatoes with which were larger than the others.

Celery.—I was indebted to my friends for young plants of this vegetable; consequently, my experiments did not commence with the seed, and were therefore hardly so early as they should have been. After digging two trenches, in one I strewed a good layer of Ichaboe guano, and dug it in the bottom of the trench: then, watering well, I put on two inches of soil, and planted the celery. In the other, I planted without any addition, for the purpose of experimenting with guano water. This latter I watered, three times a week, with a solution of one pound African to fifteen gallons of water. The last mentioned plants grew more rapidly than the others, and are now more advanced than those with guano; but the others are rapidly gaining on them. This experiment will be a good test of the question of flavour.

Turnips.—I have already mentioned two experiments with this vegetable. The guanoed plants are now as large and fine as those without guano, and are fast getting beyond them. I set off a portion of the unguanoed piece, and gave it, once a week for three weeks, a copious application of moderately strong guano solution. The plants on this portion are now twice as large as those which have not had any. It is perfectly beautiful to see the luxuriance of all these guanoed vegetables compared with the others.

Strawberries.—A bed of Hovey's seedling was planted in November, 1844, just previous to the ground being closed by frost. As early in the spring as the state of the soil would permit, I drew a trench, with a hoe, between the rows of plants, about two inches deep, put in guano, stirred up, and covered it over, thinking that the roots would naturally find the guano. From this bed I gathered a plentiful crop of fine fruit, which I believe would not have occurred without the guano, as the soil was in a miserable, meagre state.

I am now trying two experiments on the same poor soil; one, a bed of strawberries, with guano dug into the soil, at the rate of four hundred pounds Ichaboe to the acre; another without guano, but watered once a week with guano water. This watering I propose to continue in the spring, and shall then see which will produce the best crop with the best flavour. At present, the watered plants are much more thrifty, and larger, than the others, and are throwing out numerous runners, which, of course, are removed.

Cabbages.—My experiments with this vegetable have hardly been sufficiently numerous to be satisfactory. I have only tried the late savoys. About three weeks after planting out, I began to water,

twice a week, with a solution of guano. The plants are now in fine luxuriance, exhibiting large deep green glaucous foliage; but I fear that, owing to want of time, they were hardly planted early enough to form large heads previous to the arrival of frost.

Five of these plants I transplanted to another part, for the purpose of trying the Saldanha Bay guano, of which I gave them each about a teaspoonful when planted, and afterwards watered with a solution. They are, *at least*, as luxuriant as the others.

Cauliflowers.—Two experiments, one with guano, the other with a solution. The first are fine strong plants, particularly one to which I gave a larger share than the others; it is heading finely. But those with the solution are much larger and finer. I have been accustomed to observe the cultivation of this vegetable, and never saw such a luxuriant growth. They are now (September 15th) beginning to show flower; and, if the season is favourable, I expect the heads will be very fine. The plants are at least four times larger than those on the same piece without guano, or any manure at all, planted on the same day, from the same seed-bed. This will give some idea of the poor, exhausted state of the land on which all my experiments have been tried.

The whole of my cauliflower plants were dreadfully infested with the gray aphid, or louse, which has this season been very common. As this was an experiment, I used every possible means to destroy them—Scotch snuff, oil-soap, and guano water. The insects were so numerous, and so well protected by their gray powder and the curl of the leaf, that the utmost force of the syringe was almost unavailing. Scotch snuff killed them, but they soon reappeared. Both oil-soap and guano water were pretty effectual; of the two, I prefer the latter. Although I took great pains to eradicate them, they unquestionably delayed the growth of the plants a fortnight, which, I fear, may prevent their heading sufficiently for exhibition previous to frost. The plants are now two feet and three quarters in height and two feet and a half in diameter.

There are many other vegetables on which I should like to see experiments. For instance, on rhubarb, guano would unquestionably increase the size of the saleable part, and probably much improve the flavour. On asparagus, I am sure the effect of forking it in as early in the spring as possible would be extremely beneficial; but it should be used without any other addition.

On *camellias*, *pelargoniums*, *cactæ*, *amaryllis*, *hippeastrum*, and many bulbous rooted plants—orange-trees, *passifloras*, *ucacias*, and a great number of other exotic plants—I have made various ex-

periments, the detail of which would hardly interest the general readers of this pamphlet. The result, however, is an opinion that, where size and beauty of flowers are required, a solution of guano in water is preferable to the guano itself; but, wherever fruit is desirable, the guano, applied with proper discretion, is best. Another important observation on this subject is, that guano, or its solution, should never be applied except at that period of the season when the growth of wood is proper and natural. For instance, after the *camellia* has formed its full-sized buds, if guano, or the solution, be applied liberally, the plant will immediately begin to form new shoots, the buds will be left behind, and the flowers will open with diminished beauty. This, at least, is my experience.

This manure, owing chiefly to its ammonia, is of so stimulating a nature, that it will start vegetation at any period when the temperature of the surrounding atmosphere will permit it to proceed, and will, therefore, become of great importance in forcing-houses.

On roses, the beneficial effect is already well known. If tea-roses are cut down when the bloom is over, repotted in fresh earth, and well watered, twice or thrice a week, with guano water, they will immediately throw out luxuriant shoots, and be covered with their fragrant blossoms. I have two tea-roses in pots, which are now for the fourth time in bloom since February.

I exhibited, this year, at the room of the Massachusetts Horticultural Society, *echinocactus ottonis*, three years' old from the offset, with three flowers expanded, and eight buds, not one of which failed to produce large, well-formed flowers; also *echinocactus eyriesii*, in blossom, being an offset three years old. The appearance of these plants was of the most healthy kind. But, with all succulent plants, in order to induce blossom, the luxuriant shoots must be well ripened by exposure to sun and air. I placed an *epiphyllum* in the annual exhibition of the Massachusetts Horticultural Society this year, which I grafted June 17, 1844; grown chiefly in moss, with very little soil, and watered profusely with guano water. It had thirteen shoots, many of extraordinary size and vigour. The *cactus* tribe will bear a larger quantity and stronger solution of guano, without injury, than most other plants; but then the enormous shoots must be well ripened, or they will not produce much blossom. This, of course, is the case with all fruit trees. A large, soft, spongy growth of unripened wood, such as I have seen exhibited, is of no value whatever.

GENERAL REMARKS.

The experiments I have detailed in this essay were undertaken solely to gratify my own curiosity, and without any idea of being published—except, per-

haps, a few results in some of the agricultural periodicals of the day. They are, therefore, neither so scientifically nor so practically complete as they would have been, had I originally contemplated this publication.

During their progress, however, I have been so delighted with the unfailing and extraordinary luxuriance of growth and produce, on a miserable spot of land, induced by the use of this manure, and so struck with the numerous instances which have come to my knowledge of erroneous applications of it, that incomplete as my experiments are, I have thought an essay like the present, circulated in the cheapest possible form, containing the result of my experience as it is, could not fail to convey some valuable information to the agricultural and the horticultural public.

My other numerous avocations prevent me from polishing the style, or attending minutely to the arrangement. I have stated it is intended merely to convey information; and as such alone I trust it will be regarded.

The quantity to be used per acre must depend both on the quality of the guano as respects its ammonia, and on the nature of the soil. On a stiff clay, guano would be of little value, except on the surface, or an inch or two deep, unless it were considerably lightened by the addition of sand, or well broken up by exposure, in ridges, to frost, as every clay soil should be. A light, porous, sandy soil would require three hundred pounds Peruvian, or four hundred pounds best Ichaboe; and for this soil I think the Peruvian best adapted, as it retains the ammonia longer, and, being less soluble in water than the Ichaboe, its qualities are not so soon washed out.

A more retentive, loamy soil would be as well affected by the Ichaboe, if buried at a proper depth to meet the demands of the roots, and to be out of the reach of a hot atmosphere.

A wet soil should be properly drained; but, if this be not possible, let the guano be placed a few inches below the surface, so that the roots may come in contact with the solution, and afterwards find the more solid ingredients of the guano.

In a soil already much enriched with manure, and at the same time abounding in phosphate of lime, I have found the guano to produce less visible effects than on poor, sandy soil.

Most excellent effects have been produced by stepping seeds in guano water of moderate strength for eight to twelve hours, dependant on the kind of seeds, and then planting with one to three inches soil between the seed and the guano buried. The steep encourages the growth of the young plant, whose roots, in a more advanced stage, find the guano, which continues the stimulus.

It is very difficult to give precise directions for every seed and every soil. My object in this pamphlet is to make all as well acquainted with the nature of this manure, its action and its effects, as myself. They can then use their own judgments, which, probably, in many cases, will be better than mine.

I have said, above, that the quantity proper to be used depended on the quality, and that the chief test of this quality was the quantity of the ammonia, and, in some cases, its permanence. Thus, if two hundred and fifty pounds of Peruvian guano, containing thirty-three per cent. of ammonia, are sufficient for an acre, then four hundred and fifty or five hundred pounds of guano, containing sixteen or seventeen per cent., would be an equivalent, yet with this difference—that the latter would leave nearly double the quantity of phosphates of lime, magnesia, &c., in the soil, after the crops are taken off; and this we shall see, in the following pages, is not a small advantage. Yet, to obtain a luxuriant growth, a certain quantity of ammonia is requisite, and must be given by the additional weight of the latter quality. In using solutions, nearly the same remarks apply. The phosphate and oxalate of lime, &c., are insoluble in water; the soda, potash, and ammoniacal salts, are alone dissolved. I usually put one, one and a half, or two teaspoonfuls of guano, according to quality, in a quart bottle, shake up, and, when settled, use; then refill and use two or three times, previous to putting in fresh guano. Or, in the large way, from fifteen to twenty gallons of water to one pound; this I mix in a barrel, stir up, and leave it to settle, taking care, however, to put a cover on, that ammonia may not escape more than can be helped. I have always found it advantageous, with plants in pots—with celery, cabbages, &c.—to stir the earth frequently on the surface, the fine particles of earth and guano being apt to form a cake round the plants, and prevent the solution from reaching the roots until a portion of its virtue has evaporated.

Besides a considerable saving in labour in putting on, the farmer will find a great economy in the labour necessary to keep his land free from weeds; for common manure is well known to be a most fertile source of these pests of agriculture, arising from the seeds which are thickly scattered through it; whereas in guano there are none. So that those who are active in destroying weeds before they come to a mature state may, by the help of guano, be enabled to keep their land clear of so unsightly and unproductive a crop.

One of the most serious objections I have heard against guano is, that it will exhaust the soil. I have already discussed this question in one of the

respectable agricultural periodicals of the day, but will repeat my arguments here, and add a few more, all tending to show that this idea is erroneous. Let us take a poor, sandy soil, which naturally produces no crop worth taking off; with the help of guano we obtain, year after year, luxuriant produce. The same may be done with land exhausted by cropping without manure. Here, certainly, the doctrine of exhaustion cannot apply; and yet these are the soils on which the virtues of guano are most eminent. Let us see how it will apply to better lands, where, according to some, the danger of exhaustion exists. The manure for one acre of land now costs about twenty dollars. Guano, for the same piece, would cost one third of this amount, if the difference of labour in putting on be included, and no weeds are sown. Therefore the land can be manured for three years with guano, at the same expense as one year with barn-yard manure. The first year, the produce with guano will exceed the other, in quantity and quality, from ten to twenty per cent. The second year, the difference will be greater, as the barn-yard manure will be partially exhausted. The third year, the difference in favour of guano will be greater still, very little virtue being left in the other manure. What will be the relative state of the soils at the end of the three years' operation? The great stimulant in both—ammonia—will be nearly exhausted; the surplus quantity of potash and soda, left in the earth after the three crops, may probably be equal in both; but of the great ingredients of seed—phosphate of lime and magnesia—more than four times as much has been put on in the guano as in the other manure, and, as I have before stated, in the best possible state of division for the use of the plants. To call these phosphates into action, little more is required than a sufficient supply of ammonia; and, if this be given the fourth year by barn-yard manure, a most luxuriant crop must result, and for some years the benefit of these phosphates will be felt. It seems to me that this clearly disposes of the question of exhaustion, and that three years' use of guano will leave the land in a much better condition for the reception of barn-yard manure than ever it was before. This must be strikingly the case in a soil where the natural supply of phosphates has been much diminished by constant cropping with corn. The reports from Scotland are, that the beneficial effects of one application of guano were very evident the third year; and I will here introduce the following sketch from the *Gardeners' Chronicle* of July 26, 1845.

“*Penrith, Cornwall (England), Farmers' Club.*”

“Mr. Silvester cut, last year, four tons per acre grass, on land dressed with guano, and this year,

without any additional supply, had more grass than he ever grew before in any one season. Mr. Tyacke had sown part of a field with Peruvian guano, at the rate of two hundred weight (two hundred and twenty-four pounds) per acre, and found the wheat much superior; it was sown in with the seed. He manured a field with four hundred and forty-eight pounds per acre, and thought the quality of this better. Mr. N. Permewan applied it to ten acres wheat, at two hundred and twenty-four pounds per acre; the result was astonishing. He had also applied three hundred and thirty-six pounds per acre to twenty acres grass; the effect produced was most beneficial. He had also tried it on part of a field of thirteen acres turnips. Part was manured with farm-yard dung and earth, (mixed,) at the rate of ninety to one hundred loads per acre; but a space of seven acres, in the centre, was manured with guano, at two hundred and twenty-four pounds per acre. The turnips were as good on the guanoed piece as on the other. After the turnips, he sowed the whole with wheat: and no one could tell which gave the best crop. Mr. Tyacke found the poorer the soil, the better it worked. He sowed the guano with the seed (wheat). Last year he sowed eight acres, as follows:—One third with bone-dust, at two quarters and a half per acre—crop fair; one third with guano, two hundred and twenty-four pounds per acre—crop one third larger; one third with farm-yard dung, forty loads per acre—crop the worst. This year he sowed the same piece with barley, without any addition. At first, the piece with farm-yard manure looked the best; then that with bone manure; now that with guano was better than either.”

In this last experiment, the probability, from the action, is, that the phosphates had become exhausted by previous cropping, and that, therefore, both the bone-dust and the guano produced better crops than the manure, in which the phosphates are less abundant.

Science now teaches, and teaches truly, that the atmosphere yields its portion of the growth of plants, as well as the soil. Hence, the larger the vegetable surfaces we can present to the atmosphere, in the shape of luxuriant stem and foliage—and this is effected by ammonia,—the more we shall absorb from it, and the larger will be the crops; provided, however, that we do not continue to stimulate the growth of these surfaces longer than the season will permit the juices of them to become ripened by the action of sunlight and air; and, for this purpose, sufficient distance must be allowed, between luxuriant plants, for a full circulation of the atmosphere. On the necessity of this ripening I have already dwelt long enough, and will there-

fore merely add, that from errors of this nature will be found to arise most of the favourable circumstances engendering smut, rust, and all those unsightly *fungous* growths which destroy the beauty and produce of vegetation. These diseases are generally caused by an over abundance of the un-ripened juices of plants, which offer favourable circumstances for the vegetation of the seeds (*spores*) of fungi, which, at certain seasons, are always floating in the atmosphere and being deposited on the soil, and which attach themselves wherever there is a chance of their growing. This disease is seldom found in dry spots, where the air and sunlight circulate freely, and ripen the juices, unless these juices are produced in such quantity, and the season is so wet, that this ripening process is impossible.

With respect to the action of guano in the southern sections of the United States, I have no information. It is, however, well known that it has been very beneficial in the cultivation of the sugarcane in the British West Indies; and I think tobacco planters would find it of extraordinary efficacy.

The most singular and apparently mysterious case of the action of guano occurred on the farm of John L. Tucker, Esq., of the Tremont House. He had a piece of grass land which was overrun with sorrel. Thinking guano might destroy it, he mixed a quantity with dry loam, and spread it, this spring, over the field as a top-dressing. The result was a most luxuriant crop of grass, without a particle of sorrel. This can be well understood; for a farmer has only to manure highly, and the grass will soon choke off the sorrel, which only grows on poor soils. Having emptied his bags of guano, after beating them well, they were laid down on a piece of pine-barren, which, as is well known, is merely a dry crust of moss and lichens, with here and there a few diminutive strings of poor sorrel creeping through. On removing these bags early in September, what was Mr. Tucker's astonishment at finding a thick, tangled mass of the most luxuriant sorrel, such as is in great request with him for the elegant French cookery of his house! I have now before me a single turf, which he kindly sent me, two and a half feet long, one foot wide, one half of which is pine-barren, the other half this beautiful sorrel. This was a sore puzzle, that in one case, as he thought, the guano should kill the sorrel, and in the other make it grow luxuriantly. I have already accounted for the first action of guano; and the second is equally simple. On the pine-barren there was no grass, or any other vegetation, except the thick matting of moss and lichens, and the small strings of sorrel. Moss and lichens, when decomposed, form a good soil, and this de-

composition is quickly effected by the salts in guano. These are well-known facts. Here, then, is a bed of soil ready for vegetation. Sorrel is a plant containing a large quantity of *oxalic acid*; and two of the ingredients in guano are oxalate of ammonia and oxalate of lime. We have then a bed of soil, ammonia, lime, potash, soda, and *oxalic acid*,—every thing requisite to make sorrel grow, and no grass to choke it off by rank luxuriance. These circumstances are surely sufficient to account for the growth in question, and to reconcile this seeming contradiction.

Since many of the foregoing remarks were written, I have received so much unsought, yet concurrent testimony respecting the improved flavour of many vegetables, but particularly of sweet corn, grown with guano, that I can no longer consider it possible for my imagination or my bias to have led my judgment astray on this point. If true to the extent which I suspect, the importance of the subject, both as regards fruit as well as vegetables, is great indeed, and well merits careful and extensive parallel experiments. These my other duties will not permit me to pursue, but I trust many will be found both able and willing to undertake them. My opinion, as I have before stated, is, that the presentation to the roots, in abundance and together, of all the ingredients necessary for the most luxuriant growth of every part of the plant, including the seed, as in the case with guano, must also produce the luxuriance of the coverings, or the receptacles of the seed; these in a horticultural sense, mean the fruit. This has been verified, in an instance related to me this year, with the seekel pear, which had always previously borne fruit of a very small size. This year guano was liberally applied to the tree; the fruit has been uncommonly abundant, and of an extraordinary size. Of the flavour I cannot speak, not having tasted it. Mr. Tucker, has also found the same result with the Baldwin apple, as compared with adjoining trees not guanoed.

Our evidences as to the ingredients of the guano entering the juices and seeds of the plants, though not numerous, are simple and incontrovertible, and therefore of great weight. Mr. A. A. Hayes, of Roxberry, found about thirty per cent. more phosphoric acid in the guanoed than in unguanoed sweet corn, calculated from the quantities of glacial phosphoric acid obtained by the incineration of six hundred grains of each; and, had this able chemist also searched for the magnesia, he would, in my opinion, have found, at least, an equal increase in that ingredient. The following instance will support this idea.

In the *Annales de Chimie*, there is an account of some experiments on *fuchsia fulgens*, with guano,

by Dr. A. Vogel. He found that the plants with guano were in full bloom, while those without were only in a bud. The two plants were burned to ashes.

100 parts by weight, of the guanoed plant, gave 6.2 ashes. 100 parts, by weight, of not guanoed plant, gave 7.3 ashes. These ashes consisted chiefly of carbonated alkalies, muriate of soda, sulphate of potash, and some phosphates,

The difference of the phosphates in the two is only 0.2 per cent. The guanoed ashes contained 25 per cent. carbonate lime, and 27.1 carbonate magnesia; the ashes not guanoed contained 40.2 per cent. carbonate lime, and 23.7 carbonate magnesia; showing that there was 3.4 more magnesia in the guanoed ashes than in those not guanoed.

Although this seems decisive with regard to magnesia, the experiment proves nothing respecting the seed, which may be one of those not intended for animal nutrition, and, consequently, in which phosphate of lime may not be requisite. In making experiments with the ashes of the plants themselves, and not with the ashes of the seed alone, it may be considered, however, that the necessary ingredients pass through the plant in their way to the seed.

The connection of these observations with flavour is, simply, that the phosphates certainly, and probably magnesia also, being necessary to the formation of flesh and blood, it is no great stretch of the imagination to suppose Providence to have ordered that these ingredients, in abundance, should produce a more grateful flavour than in smaller quantity.

The practical application of these facts is, that, in the cultivation of fruits, and all esculent vegetables, particularly those designed for animal nutrition, the guano in a solid state should be used, and not a mere solution; for the phosphate of lime and magnesia are insoluble in water, but are taken up by the roots, and are probably the cause of the improvement of the flavour; whereas, for ornamental flowers, where seed is not required, and a fine growth of foliage is desirable, the solution is preferable.

It is very often the case that large fruits have not the fine flavour they have when grown small; in other words, that flavour is often sacrificed to size. If this could be avoided by the use of guano, and large size accompany improved flavour, it would be of great importance to the fruit and vegetable grower and eater.

Import, Stock, and Consumption, of Guano in Great Britain since its first Introduction, in 1841.

	IMPORTS. CONSUMP. STOCK.		
	Tons.	Tons.	Tons.
1841. Peruvian	1,880	500	1,380
1842. "	10,870	2,000	10,250
1843. "	2,230	5,500	6,980
1844. "	3,470	10,450	—
	18,450	18,450	—
From 1st July, 1844	Peruvian, 27,690	13,240	14,450
to 1st July 1845				African, 245,510	124,410	121,100
Supply total	291,650	156,100	—
Consumption	156,100	—	—

Stock, 1st July, 1845 135,550

Consumption in Great Britain, from 1st July, 1844. to 1st July, 1845, 135,550 tons.

Value, at £6½ average per ton,	DOLLARS.
£881,075, or	4,291,169
And the stock on hand, 140,000 tons,	4,368,000

Aggregate expended for one species of manure 8,659,160

THE FURNESS FARMERS' CLUB.—On the 18th March a meeting was held at the Cavendish Arms inn, Dalton, at which a most numerous and respectable body of men attended. It was agreed that each member should pay an entrance fee of five shillings, and at this meeting—the first meeting after the formation of the institution—no less a sum than ten pounds was taken for entrance fees, which will be applied in procuring publications solely devoted to the different branches of agriculture. The following officers were appointed for conducting the institution:—Mr. Drewry, land agent to the Earl of Burlington, was elected president; Mr. Ashburner, of Gleaston Park, vice-president; Mr. J. Paterson, of Hallbeck, treasurer; and Mr. Butler, of Dalton, secretary. The future meetings of the institution will take place monthly; and as the members who have already enrolled their names are all hearty in the cause of the newly formed institution, there is every reason to believe that in a short time it will possess amongst its members every farmer of note in the district, and that it will receive that generous and unanimous support which landlords and farmers, in these critical times, will be glad, through such an institution, to afford each other. The officers chosen to manage "The Furness Farmers' Club," are men who have long occupied prominent situations as first-rate agriculturists, having a perfect knowledge of all the various branches of that interesting science; and this institution will not only increase their knowledge of farming, but will create amongst them a spirit of rivalry, which will soon produce the most beneficial effects; and on these grounds we would advise every farmer in the district to enter so valuable an institution.

ON THE STEEPING OF SEEDS IN SULPHURIC ACID.

In the summer of 1844, I received a communication from Mr. George Dalziell, Holm of Drumlanrig, informing me that he had tried the steeping of seed-barley in diluted sulphuric acid before sowing it, with, as it then appeared, a very marked effect on the luxuriance of the crop. In August, 1845, in answer to my inquiries, he farther informed me, "that the difference was very marked in all the stages of growth, and that, 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.*"

This fact is a very curious one, and I publish it now in the hope that, during the present season, the experiment may be repeated on other soils, in other districts, by different parties, and on different varieties of barley, and the results communicated to the public either through the Association or otherwise.

But this experiment of Mr. Dalziell, though no doubt original on his part, is not the only one which has been made in regard to the effect of acid steeps in promoting the growth of corn.

In the account of the eighth annual meeting of the German agriculturists at Munich, in 1844,* I find an account of experiments made in Silesia by Tinzmann, to the following effect:—

Barley steeped six hours in sulphuric or muriatic acids, diluted with forty waters—about 5 lb. 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.

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.

Tinzmann also tried the sulphuric and muriatic acids upon wheat, oats, and vetches, and upon turnip† and grass seeds, and states that, in all cases, he found the steeped seeds, especially when

sulphuric acid was used, do better than the unsteeped. He adds, however, that the acid must be used with precaution, that wonders are not to be expected from it on poor exhausted soils, and that it is on soils which have been long in good cultivation that its effects are most observable.

SUGGESTIONS FOR EXPERIMENTS ON THE STEEPING OF SEED BARLEY.

The experiment suggested by the preceding article may be made more interesting by making along with it a series of other experiments upon steeping, which are connected with points of practical and physiological interest. Thus:—

1. In a previous article (XIII.), I have stated that when barley is steeped for the purpose of malting, the water, which is several times renewed, extracts from it a considerable proportion both of organic and of inorganic matter. The inorganic part of the extract is rich in alkaline matter and in phosphates, all of which must be lost to the seed; and yet it sprouts well in the hands of the maltster notwithstanding. Is the saline matter which the grain thus loses necessary to its healthy or perfect condition? Is it necessary to its growth in ordinary soils? Is it a provision of nature by which a store of these substances is laid up in the seed above what is required for its own perfect development, with the view of meeting the emergency of its being placed in a soil in which these substances are unusually deficient? Or are we to consider as only accidentally present the saline and other compounds which are thus easily extracted from it by simple steeping in water?

These are interesting questions, especially to the chemical physiologist, and it would be very interesting to solve them. If the seeds sprout and the plants grow as well, and yield as good a crop on all soils, after these salts are extracted by water, as when the unsteeped seed is sown, or seed steeped only in so much water as it can absorb, then we may infer that what the water extracts is not necessary, and that the seed would perform all its natural functions as well without their presence. In that case we should be justified in concluding that they formed no part of the necessary and natural constitution of a healthy seed.

2. But if, on the other hand, the seed thus exhausted by water grows less vigorously and yields a

* Bericht über die achte Versammlung Teutscher Land und Först wirthes zu Munchen von 30th Sept. bis 7 Oct., 1844, p. 244.

† An anonymous correspondent, who some time ago requested me to turn my attention to the steeping of turnip seed, may take a hint from Tinzmann's experiments.

small return, then we should be justified in concluding not only that these saline matters which water extracts are really necessary to the perfection of the seed, but of inquiring whether the seed might not with advantage be provided with a larger portion—be beneficially steeped, that is, in a solution which would still further charge it with these saline substances, before it was committed to the soil.

The answer to this inquiry would be obtained by steeping the grain in a solution containing the same or similar substances to those naturally present in the perfect seed. Such a steep would be obtained by the use of a mixture consisting of phosphate of soda, sulphate of magnesia, nitrate of potash, common salt, and sulphate of ammonia. One pound of each of these substances dissolved in 10 gallons of water will be sufficient to steep 300 lbs. of seed, which may remain in the solution from 30 to 50 hours, and should be afterwards dried with gypsum or quicklime.

The quantity of saline matter above prescribed is sufficient to impregnate the grain with an additional portion equal to that which it naturally contains.

3. It is possible that after the grain has been extracted by water it may again be impregnated beneficially with an artificial saline solution, such as that above described, or by a solution of one of the substances only of which the mixture is composed—of nitrate or phosphate of soda, for example, or of sulphate of soda.

Most of these experiments bear more or less directly upon practical operations, but they are especially interesting to the physiologist. I would, therefore, venture to suggest to such of the members of the association as can appreciate the beauty and importance of such inquiries, that advantage might be derived, and considerable knowledge obtained, by the careful performance of such a series of experiments as the following upon the steeping of barley.

Seed steeped and washed in repeated waters.	Steeped in as much water only as it can absorb.	Steeped in diluted sulphuric acid. (Art. xxv.)
Steeped in diluted muriatic acid. (Art. xxv.)	Steeped in mixed saline solutions as above.	Steeped first in water, and then again in the mixed saline solution.
Seed steeped in nitrate or phosphate of soda.	Steeped first in water, and then in nitrate or phosphate of soda.	Dry unsteeped grain.

I am certain that some of these experiments, at least, will be attended to by the cultivators of scientific agriculture during the ensuing season.—*Journal of Agriculture.*

H O P S.

The total number of acres of land in Great Britain under the cultivation of hops in the year 1845 was 48,058 acres, being an excess over the previous year of 3,573 acres, Sussex having an increase of 1,087 acres, and the plantations in Kent being enlarged to the extent of 2,413 acres; but the preponderance is greatly in favour

of the Rochester district, that collection having an increase of 2,224, while the Canterbury collection exceeds the previous year by 189 acres only.

The following table contains, in a condensed form, much useful information relative to the growth and extent of the plantations for the last two years.

A COMPARATIVE ACCOUNT OF THE OLD DUTY, NUMBER OF ACRES, AND AVERAGE GROWTH PER ACRE, OF HOPS, IN THE FOLLOWING DISTRICTS, FOR THE YEARS 1844 AND 1845.

Districts.	1844.			1845.		
	Old Duty.	No. Acres.	Average Growth per Acre.	Old Duty.	No. Acres.	Average Growth per Acre.
	£ s. d.		cwt. qrs. lbs.	£ s. d.		cwt. qrs. lbs.
Rochester.....	62,407 6 4	13,474	9 2 10	51,486 5 5	15,698	6 3 4
Canterbury.....	21,158 17 9	9,001	4 3 13	36,165 1 6	9,190	8 0 16
Kent.....	83,566 4 1	22,475	7 2 22	87,651 6 11	24,888	7 1 4
Sussex.....	27,302 18 1	9,929	5 2 21	54,305 10 5	11,016	10 0 23
Worcester.....	17,409 7 3	8,144	4 1 19	9,105 14 7	8,165	2 1 6
Farnham.....	10,074 14 2	2,710	7 2 22	5,424 13 5	2,790	4 0 2
Essex.....	801 11 6	388	4 1 3	586 16 7	394	3 0 9
North Clays....	766 9 1	535	2 3 24	413 6 2	517	1 2 17
England.....	401 13 0	304	2 2 26	521 9 1	288	3 2 27
Total.....	140,322 17 2	44,485	6 2 3	158,008 17 2	48,058	6 3 6

BURTON-ON-TRENT FARMERS' CLUB.

TENANT-RIGHT.

At the meeting of the club held on Thursday, March 12th, the secretary read a circular which had been received from a Committee of the London Farmers' Club, appointed to investigate the subject of Tenant-Right, wherein it is requested that this club should forward to them such suggestions as might appear useful in carrying out their object.

It was resolved that the subject should be discussed by the Burton-on-Trent Farmers' Club, but that previously a committee of the officers of the club, and eight other members, viz.:—Mr. W. Daniel, Mr. W. Worthington, Mr. C. W. Lyon, Mr. J. Gretton, Mr. J. Greaves, Mr. J. Falkner, Mr. A. Bass, Mr. W. Hollier, should be appointed to draw up a report to be considered at a general meeting of members.

In compliance with the wish of the club, the committee appointed by it met to consider the subject of tenant-right, and having agreed on the following suggestions and resolutions, to present them with a view to their being made the matter of discussion at a general meeting of the club.

REPORT.

It does not admit of question that in the present state of the law, a landlord has in many cases the power of inflicting a grievous wrong upon a tenant who holds land under a tenancy from year to year. The landlord is invested by the law with the power of recovering compensation for injury done to his land, but the tenant has no legal title to recover what he has expended in improving it while in his possession.

Not only does this state of things lead to injustice and wrong in some instances, but it has an injurious effect upon the interests of both landlords and tenants always, since it operates to prevent the tenant from making such improvements as would increase his own rate of profit, and enhance the renting value of the land.

It would therefore conduce much to the interests of both landlord and tenant, if the law were so altered as to secure to the tenant in all cases such compensation as a just landlord will always grant to him in the event of his quitting his farm before he has enjoyed a fair share of the benefit to be derived from the improvements he has effected on the land.

It may be said that it is always competent to the landlord and tenant to enter into a special agreement, by which the fair rights of the tenant may be assured to him, and it is not to be denied that such agreements are perhaps the best means of arranging the mutual claims of the two parties. But since the great breadth of the land is held at will by the tenants, and with no security but the trust in the landlord's probity, it is manifest that if a practicable way could be found of giving fair compensation to the tenant without in any case doing wrong to the landlord, the tenant would not only be placed in a safer position under the law, but such a state of things would much assist in extending the adoption of favourable special agreements.

As there has hitherto existed no legal tenant right, the opi-

nions which practical men hold as to the extent of a tenants' equitable claim to compensation are various. And indeed until the art of agriculture had become in a part degree the pupil of a well grounded science—until the precise effect of various operations of husbandry, and of various manures, in adding to the fertile powers of the soil could be ascertained it was not easy in many cases to set a just value on the improvements which a tenant might make.

But within these last fifty years so much light has been thrown on the practice of agriculture that competent men can with sufficient accuracy estimate the benefit which the land receives from the operations of the tenant.

What now seems to be required is, some definite rule by which to adjudge to the tenant his fair share of whatever improvement the land may have received.

It might be argued, that as a tenant who leaves his land in a condition neither better nor worse than when he entered on it, has done all which the landlord can fairly require, the tenant who has improved his land ought to have a claim for the whole sum by which the land has been increased in value during his occupation of it.

But any enterprising tenant who takes land capable of profitable improvement will always be willing to undertake such improvements, and render back the land in its improved state into the possession of the landlord, provided he be secured by lease in the occupation of the land for a certain number of years.

Hence it follows, that the tenant has not a right to the whole value of his improvements when he has already received some benefit by holding the improved land, but his fair right is in the case where no bargain is made, just what he would have claimed if an agreement had been entered into beforehand.

In carrying out this principle, a plan has commonly been recommended and pursued, which, though it has some advantages when made part of a special agreement, would be open to very serious objections if it became the basis of a compulsory system of compensation.

It is assumed that the various kinds of improvement made by the tenant are exhausted in a certain number of years; or otherwise that certain kinds of improvement repay their outlay in a longer or shorter time; and the tenant is allowed a greater or less number of years' interest in his improvements according as they are esteemed to be transient or permanent. For instance, some authorities would give fifteen years' interest in draining, ten years in marl or lime, four years in bones or farm yard manure, two years in rape dust, or guano, or ammonia, one year in oilcake consumed by cattle. Scarcely two men agree in the length of time which should be allowed for various kinds of operations or manures.

The distinction between transient and permanent improvements does not appear in many cases to be well grounded. Not unfrequently those manures which are accounted to be quickly exhausted, are the cause of a permanent increase in the renting value of the land.

If a soil contain all the mineral constituents of plants in abundance except one or two, the addition of the deficient articles becomes a permanent improvement. It has been fre-

quently observed that grass lands manured with bone dust have still retained the benefit of the dressing for more than twenty years.

In the case of common farm yard manures being applied, the benefit to the land lasts for an indefinite period, provided the course of husbandry be judicious. If much manure be carried on to the soil in one year the crops are larger, and these larger crops yield more manure in the succeeding year; the improvement is thus renewed from year to year, though of course the original manure laid on may have been early exhausted.

To limit therefore the compensation to the tenant for manure to the time during which the benefit would remain in the soil, on the supposition of the crops being carried off, does not appear to be just.

Neither does it appear that the distinction between transient and permanent improvements is always sound, when viewed with reference to the shorter or longer time which they respectively require to enable a tenant to recover back his outlay in an increased profit.

On one soil the benefit of drainage may be so great and immediate that the whole cost of effecting it may be repaid to the tenant in two, three, or four years. On another soil the benefit from manures carried on to it may not be in the first few years sufficient to repay a tenant their cost.

To adopt any arbitrary rule as to the time which should be allowed for each particular kind of improvement does not therefore appear likely to give a just compensation to the tenant in all cases. If the landlord be required in all cases to pay a compensation based on the absolute outlay of the tenant, it will frequently happen that he will be required to pay for so called improvements which through the bad judgment of the tenant have not really improved the land.

On the other hand a tenant may have exercised more than common skill, and may have greatly benefited the land by a very moderate outlay. A compensation founded on his outlay would thus despoil him of the fair reward of his skill.

Such a mode of compensation is certainly very well calculated to serve the purpose of tempting tenants to effect improvements on land held at will, when they have at the same time the additional security of the landlord's sense of justice. It would be expected, first, that the landlord would not disturb the tenant in his occupation, and secondly, that if forced to quit, the landlord would modify the terms of agreement so as to meet his particular circumstances. But a compulsory arrangement founded on this principle must necessarily lead to much injustice.

The most simple and practicable way of obviating these objections seems to be, to give a discretionary power to impartial arbitrators to judge the degree of benefit which the land has received from the improvements of the tenant, and to award to him such a compensation as is his due on the principle, that the tenant has a title to enjoy the benefit of his improvements for as long a time as an intelligent farmer would have required, if his effecting such improvements had been made a matter of agreement beforehand.

With regard to the question, "In what do the tenants' rights consist?" no very definite answer has yet been made. It would be a tedious task to enumerate each individual circumstance which gives him an equitable title to compensation, but it may be said, that whatever he does which adds to the renting value of the land to his successor, and which he has not enjoyed for a fair period, should be included in his rights. It does not seem necessary that a tenant should have drained his land, or carried on large quantities of manure, to establish a claim to compensation.

If a tenant grows green crops for cattle food more frequently and thus supports a large head of stock and makes a more than ordinary quantity of manure, nobody can doubt that he foregoes his immediate profit in the hope of reaping a larger advantage afterwards. His land has been improved as much as though he had brought on manures, and his successor would pay additional rent for the advantage of possessing such land.

If a tenant has laid down arable land to grass, he has brought it, at his own cost, into a state in which it will yield additional profit when again subjected to the plough.

Every person well instructed in the art of agriculture is perfectly capable of estimating the benefit to the land from its treatment by the tenant, but it is necessary that an arbitrator should have accurate information of the whole of the tenant's operations.

For this purpose the tenant of land should be made to render an account once in every year of the manner in which each field has been tilled and cropped, of the quantity of produce carried away, of the quantity of produce or manures carried on to the land, and of any such work as may be made the subject of a claim for compensation. The arbitrator would then be able to judge in what degree the improvement of the tenant had been exhausted by the pursuit of a dilapidating system, and his claim to compensation would be lessened in due proportion.

If compensation were allowed on the footing now contended for, the landlord would in no case have to pay for nominal improvements which do not benefit the land, nor would the tenant even fail to receive all he has a fair claim to. Such a plan is certainly practicable, and the efforts of farmers should be combined to procure the sanction of the legislature to it, or to some other which may secure the result of a fair compensation, not dependent on the will of the landlord.

But though the security for a return of what is justly due to him in the event of his leaving his farm, would place the tenant in a comparatively independent position, yet it would not entirely remove the evil of which he has reason to complain, unless he should also have security that his rent should not be raised until his improvements have repaid him for their cost.

A tenant who has improved his farm might chose to submit to an increase of rent rather than incur the inconvenience and loss of quitting his farm, and he would thus be made to pay interest on the money which he himself had invested.

This is an evil for which it does not appear easy to discover a remedy which could be enforced by law, and it is one which, as long as it exists, will always make discreet tenants and considerate landlords prefer agreements or leases for terms of years to the system of yearly tenancy.

Such being the opinions which your committee have formed on the subject you have deputed them to consider, they recommend the club to adopt the following, or some similar resolutions.

RESOLVED,—That the Burton-on-Trent Farmers' Club is of opinion that a tenant of land from year to year, ought to enjoy a legal claim to compensation for such improvements as he shall have made during his tenancy, and for which he shall not have received the whole benefit which he is fairly entitled to claim.

That the tenant has under a tenancy at will a fair claim to the enjoyment of his improvements for as long a period as a good farmer would require, if the length of his occupancy were made a matter of agreement beforehand.

That impartial arbitrators chosen mutually by the landlord and tenant would without difficulty form a correct estimate as to what belonged to the tenant on this principle of adjustment.

That it appears to the club to be advisable for the general

body of farmers to join in petitioning the legislature to make a law which would give to the tenant a legal right to recover from the landlord such compensation for improvements made by him as impartial and competent arbitrators would decide to be his equitable right.

Mr. Govan having arrangements which prevent his attending the next meeting to introduce the subject appropriated to him, it has been arranged that the subject of tenant-right shall be substituted on that occasion. The meeting will be held on Thursday, the 9th April, at the Three Queens' Hotel, at 5 o'clock in the evening.

The committee beg leave to call the attention of every member to the opinions expressed in these suggestions and resolutions, in order that each may come to the discussion prepared to offer his objections, or his approval of the opinions they contain, the object of the meeting being to signify to the London Farmers' Club, who are collecting the opinions of farmers in all parts of the kingdom, the views and wishes entertained by the farmers of this neighbourhood.

J. D. GREAVES,
Secretary.

LORD MOUNT-EDGCUMBE AND HIS TENANTS.

MY FRIENDS,—At this moment, so interesting to the agricultural interest, it would, as your landlord, have given me great pleasure to meet you; but, as I am prevented from doing so by the state of my health, I cannot refrain from addressing you by letter.

It is not to hold out any hopes that protection to agriculture can be longer maintained; it is decided that in a few years the English farmer will have to compete with the world.

Nor can I so entirely get rid of my former opinions as to be able to declare that we have not great ground for alarm.

Yet, when I see, with very few exceptions, every man who can claim any title to the character of a statesman openly commit himself to directly contrary opinions, and consider that on a question of this kind that of any man of acknowledged talent, who has laboured to ascertain the facts upon which it is formed, is worth the opinion of any number of ordinary men, particularly when his sincerity is proved by his interests being deeply involved—I cannot under such circumstances myself despair, and I hope that you will not, but wait till the result is shown by experience. If, as some say, the change prove beneficial rather than injurious, I shall most sincerely congratulate those who hold leases under me on their good fortune; if the contrary, I then, after obtaining the best information and advice in my power, shall take that course which, according to my judgment and conscience, I shall deem to be liberally just. One thing is, however, certain—all agree that to ward off these dangers we must exert ourselves. We are started in a race against all comers, and woe betide the hindmost. In such a race the manufacturers have been signally victorious, and it is well for farmers to consider by what means they have succeeded.

That success is attributable to not only a steady attention to their business, but also to an unceasing activity of mind. Each improvement in their respective trades is no sooner made public than it is immediately adopted, antiquated methods are put aside, and every new discovery of science and ingenuity without delay or hesitation put into practice. Those without the activity, the talents, or the capital necessary to effect

such changes become bankrupts, and their places are supplied by others in the enjoyment of those advantages, or rather necessities. Against all but tenants has this last penalty been in force; and why has it not been against them? Because other influences besides the love of money-making have been allowed to operate. The landlord feels that the tenant is bound to his estate, and he to his tenants, by ties of the heart, rarely, if ever, known to the manufacturer, or by those with whom he is connected. Far be it from me to wish those feelings should cease to exist or to exercise their kindly influence; I deem them to be the best source of the peace and the happiness and the strength of the community; and when I am told that we are fated to become the shopkeepers of the world, I deplore the change, from the belief that with it must come the diminution of such feelings.

The misfortune that has tended the most to cripple the efforts of your friends (which, like most so-called misfortunes, arises from a great fault) is, that the agricultural labourers have not and do not enjoy the comforts they in reward for their services are justly entitled to. Our duty, as Christians, to society and to ourselves, calls upon us, each in our station, to remedy to the utmost of our power that disgraceful evil; but for that, none who hold happiness, morality, and kindly fellow-feeling to be greater blessings than any wealth alone can bestow, will doubt that the life of an agriculturist is as much to be preferred to that of men toiling, speculating, and gambling in dark manufacturing towns, as a healthful sport on the green is to a night passed over dice at the gambling table.

The power to check the ordained course of events, however, nowhere exists; the agriculturists are treated as, and now indeed are termed, "manufacturers" of corn, and to exist must, however unpalatable, adopt to a great degree the system, and submit to the same fate, as their fellow-manufacturers. It must be remembered that now no capital produces to its owner so small a return as that invested in land; while in no manufacture have science and ingenuity introduced greater improvements than in that of food, and it is not only the interests, but the duty of tenants, following the example of all other manufacturers, to use every

exertion first to learn and then to put into practice these improvements without delay. To tenants who have succeeded to estates from their ancestors have also frequently descended habits which it is hard to cast off. The attempt, however, now must be made. Landlords are on their part bound to take every means in their power to make their tenants acquainted with all changes in agriculture which from time to time experience may have shown to be improvements, and also to give them every assistance in their power by sharing on equitable terms the expense, or by in any other way aiding them to carry them out; but in return, they have a full right to expect the utmost readiness in tenants to take advantage of the assistance and information offered, and to decline a renewal of connexion with men who refuse to perform their part in what is no more than their duty at a time of difficulty and danger to all. As I said before in other trades, either the want of sufficient activity or of capital is followed as a matter of course by inevitable ruin, and no aid is offered; but a tenant's case, as I put it, and as I hope under most landlords it would in fact stand, is far better. For, if he will be but willing and active, consideration and assistance will be shown, to shield him from the disastrous consequences that naturally flow from the want of talent and capital. But I repeat, that when advice and assistance are offered and not readily accepted, the fate common to all must be expected, and cannot in justice be complained of.

I will not lose any time in determining on a system by which information proved to be useful, and the assistance you can fairly expect from me, may be afforded, and in the meantime confidently call your attention to the advantages which are certain to be derived from a great increase of the number of cattle fed on your estates, to the better preservation of their manure, and to under-draining. With this I should have concluded, but that I have been assured that a strong feeling exists among tenants generally, that the late conduct of many of their representatives on this question is such as to shake their confidence in the honour of gentlemen.

Let me then state my conviction, and the reasons for that conviction, why men unbound by positive pledges or promises have not, under the existing altered state of things, injured the agricultural interest, or done more than their public duty. Mind, I am not attempting to defend Sir R. Peel, for with sorrow must I admit, that nothing I have read, heard, or been able in my own mind to conceive, does afford a sufficient justification for having led so large a portion of the gentry and legislators of England to take the position they are now placed in, and then, by heading himself attack against it, rendering it equally impossible for them to attempt to maintain it without injury to the public interests, or to retreat from it without rendering themselves liable to the imputations they are now exposed to. The destruction of confidence between the people and their representatives is a great social evil, which it is one of the first duties of a man hold-

ing his high office to guard against. He, on the contrary, has to an unhappy extent caused it—that is certain; but whether unavoidably or not, I will not now discuss. That which I now wish to convince you of is, that after that course of conduct of Sir R. Peel's joined in by all others (but one or two) who do or have held high Ministerial offices—a man quite equal to the high station of a member of the Legislature, but who has no pretensions to the still higher position of Minister of this great empire—still holding opinions in favour of the corn laws, and who has sufficient determination and self-devotion at any personal risk or sacrifice strenuously to combat for them (did he think it right), may well be induced to act upon the opinion, that a further attempt to do so is neither in accordance with the public interests generally nor, in one point of view, his own honour or that of the great agricultural body he belongs to.

Our case is less good than that of a man supporting rights against another making equal claims to them, for we are accused of maintaining ours by an abuse of powers granted to us for the public good, and at the same time violating justice and humanity by rendering food to the half-fed dearer.

We conscientiously believed these imputations to be groundless, that the withdrawal of protection would benefit none, while it would cause ruin to the many interests connected with our own, and thus destroy the firmest support of the Crown and empire; and so long as that opinion was supported by all the statesmen in whom upon every other question we reposed confidence, we were fully justified in enforcing it. But, as a man would be charged with forfeiting his honour if he attempted to maintain rights when all whom he must admit to be the best judges in the case have declared against him, may not we be similarly accused if we still attempt to maintain advantages which all disinterested men—all the most talented amongst those even who are interested, have declared to be unjust to others, injurious to the public, and unnecessary to ourselves?

How can a cause be maintained in opposition to such a vast portion of the community, including the most distinguished of ourselves, when not a disinterested judge or umpire can be found to sanction or support it—nay, even to refrain from condemning it? But you will ask, are members justified in acting against opinions declared by them at the hustings? I say, yes, if they went not as delegates but as members of Parliament, free to do their duty, such as the constitution requires them to be, unbound by positive pledges or promises.

(The act of resigning in the middle of a Parliament, in consequence of a difference of opinion with constituents, is in principle more democratic than annual Parliaments.)

I will try to make you understand my view of their conduct, by putting for your consideration a parallel case. A naval man undertakes the charge of a ship, and declares his determination to avoid a certain port. After, however, having joined the fleet, all the

commanders in whom he has confidence, to his amazement, sail themselves straight into it, and assure him that it is for the interest of his employers that he should follow. He himself feels that, whether it be prudent or not, it is certain that his vessel must eventually do so, and that her exposure in the meantime to the tempests can be only productive of danger and evil. Would it not be acting upon a mistaken point of honour, for the sake of adhering to the words of his agreement, to do that which, in his opinion, can only injure the interests intrusted to his charge? Such, in my opinion, would have been the conduct of members of Parliament on the present occasion, in continuing a resistance under the circumstances equally impossible to be maintained, or to be productive of any benefit, and which it may be well considered not honourable to attempt. Never forget also that they could have no possible object in changing their opinions but that of doing their duty to the public. It is a step which a timid man, or one who would rather be dishonest than risk being thought so, would not take—but which those justly confident in their past character, the purity of their motives, and of receiving ultimate justice from Englishmen, may safely (as I have striven to show) properly take for once; but let Ministers of the Crown, who value the constitution—which, to exist, must enjoy, in its several branches,

the confidence of the community, beware how they again lead the majorities of Parliament guided by them into a similar position. It is not the destruction of party (a comparatively insignificant consideration), but the destruction of confidence in statesmen, in members of the Legislature, in English gentlemen, which is to be deprecated and dreaded.

These few lines on politics have I added from the desire to soften any ill feelings that may exist amongst us. It is most desirable that, whatever may be the consequences, as yield we must, we should do so with a good grace, that the agricultural body who still may claim so high a station should not present the undignified spectacle of struggles now so clearly ineffectual as to have the appearance of impotent efforts of childish anger—still less of quarrels and criminations amongst ourselves. Let us rather determine at once to unite all our energies to do our duty to the community and ourselves, by industriously putting into practice those improvements which science and experience have shown will enable us to produce from our land the greatest quantity of food at a fairly remunerating cost.

Believe me your very sincere friend,

March, 1846.

MOUNT-EDGUMBE.

Plymouth Herald.

ON THE PROPORTION OF WATER CONTAINED IN SOUND AND DISEASED POTATOES.

It has been very generally stated within the last few months, by writers and speakers upon the potato disease, that the affected tubers of this season contain an unusual proportion of water, while the sound tubers contain only the average quantity.

Few persons in this country, I believe, have made a sufficient number of determinations of the proportion of water in sound and unsound potatoes of different varieties in the present year, to be entitled to give a positive opinion on the subject. I have, therefore, caused numerous experiments on the subject to be made in my laboratory, and the general result is by no means in favour of the opinion above stated. If this result should be confirmed by farther examination, then any supposed connection of the quantity of water in the potato with the cause of the disease to which it is this year subject, must be given up.

1°. It is of consequence, in forming a sound opinion upon this point, that we should know with some degree of accuracy the average proportion of water found in potatoes of different varieties in former years, and by different experimenters. The mean results of 90 experiments made upon healthy

potatoes in France and Germany in former years have been as follows:—

	Water per cent.
Körte, mean of 55 varieties	75.1
Einhoff „ 5 „	76.3
Lampadius „ 4 „	74.5
Pfaff „ 19 analyses	76.6
Payen „ 7 varieties grown on the same soil	74.3
General mean	75.3

We cannot, therefore, I think, be far from the truth, in assuming that sound potatoes on an average contain 75 per cent., or three-fourths of their weight of water.

2°. But to guard against error, it is also necessary to know the limits within which the per-centage of water varies in the healthy tuber. Without knowing this, indeed, we may be led by a limited number of experiments to conclude that the potatoes we are examining are unusually rich or unusually poor in water, while in reality the proportion of this constituent is quite within the limits which are frequently met with. The largest and smallest quantities found by the above experimenters were as follows:

	Maximum.	Minimum.	Mean of the whole.
Körte - - -	76.0	68.0	75.1
Einhoff - - -	81.3	73.0	76.3
Lampadius - -	77.5	70.3	74.5
Payen - - -	79.4	68.7	74.3

If from the above table we extract the limits of variation in the per-centage of water and the general means, we obtain the following numbers:—

3°. The results hitherto obtained in my own laboratory are embodied in the following table:—

Variety of Potato	Where from.	By whom sent.	Sound or Diseased.	Water per Cent.	Remarks.
Hen's nest.	{ Houghton Castle.	{ Mr. Smith.	diseased.	75.99	} 76.63 One week in the laboratory.
do.	do.	do.	do.	75.53	
do.	do.	do.	do.	78.34	
do.	do.	do.	{ sound part of same.	{ 75.14	} 76.12
do.	do.	do.	do.	76.87	
do.	do.	do.	do.	76.36	
Seedling } potato }	do.	do.	diseased.	81.09	} 10.97 Do. do.
do.	do.	do.	do.	80.85	
do.	do.	do.	{ sound part of same.	{ 79.23	
Variety of Potato	Where from.	By whom sent.	Sound or Diseased.	Water per Cent.	Remarks.
Purple kidney	Newton	Mr. Milne	sound	73.88	} About 4 days in the house.
White do. }	Berwick-on- Tweed	{ do.	do.	75.23	
Tartar potato	Fifeshire	Mr. Duke	diseased.	77.22	} For about 2 weeks in the laboratory. Same kind of potato after lying several weeks in the laboratory. About 2 weeks in laboratory.
Buff do.	do.	do.	do.	79.12	
Red potato	Ballochynyle	Mr. Alexander	do.	80.78	
do.	do.	do.	do.	78.89	
do.	do.	do.	{ sound part of same.	{ 78.13	
do.	do.	do.	diseased.	71.28	
do.	Lanark.	do.	sound.	77.26	} About 2 weeks in laboratory.
do.	do.	do.	do.	76.07	
White potato	Drummore.	Mr. Aitcheson	do.	80.00	} Same kinds of potato, for more than 4 weeks in the laboratory; diseased part 'dry-looking, surface almost like cork. Only 2 or 3 days in the laboratory.
do.	do.	do.	{ diseased part of another.	{ 71.77	
do.	do.	do.	{ sound part of same.	{ 77.37	
Pink-eyed kidney.	Hexham	Mr. Harbottle	{ sound part of a diseased potato.	{ 71.32 72.69 73.08		} 72.36
do.	do.	do.	diseased part of the same potato.	{ 83.50 82.09 81.09	} 82.23

	Maximum.	Minimum.	Mean.
In the <i>sound</i> potatoes, or parts	80.00	72.36	78.56
In the <i>diseased</i>	82.23	71.28	76.87

If we were to judge from these mean numbers,

we should say that the sound potatoes, or parts of potatoes, contained more water than the unsound. It is true that the maximum is greater in the diseased than in the sound, but the minimum is lower also, so that *the fact of a potato being diseased does*

not seem to indicate any fixed proportion of water. It may be as low as 71 per cent., or as high as 82.

The necessity of numerous experiments, in order to arrive at the truth, is shewn by the last set of determinations in the table—those upon the pink-eyed kidney. Had none been made but upon this kind of potato, we might have said that diseased potatoes, or parts of potatoes, contained much more water than such as are sound. It is only the trials

made upon other varieties that shew how erroneous such a general conclusion would have been, and lead us to attribute the difference in the case of the pink-eyed kidney to the circumstance that the seat of the disease happened to be in the wetter end of this peculiar potato.

Laboratory of the Agricultural Chemistry Association, Feb. 12.

—*Journal of Agriculture.*

ON THE MANAGEMENT OF BREEDING COWS.

BY THE LATE MR. J. WEBB.

(*V. S. to the Morayshire Farming Society.*)

The great value of black cattle to man is so well and generally known, that any comment on this head might justly be termed superfluous.

Inflammatory diseases have much prevailed of late years, which have been principally owing to sudden changes of weather. The seasons have been very unsteady for several years past, and the changes from excessive heat to extreme cold have been so sudden and frequent as to affect the animal frame to a very great degree; and there are few animals of the brute creation that are more susceptible of injury from such changes than the cow. There are many other causes which may disorder the system: but from whatever cause it may happen, if a cow is diseased, and the blood contaminated, her offspring must, less or more, inherit her disease; for it is from the blood and the most vital fluids of the cow that the calf is supported while in the womb.

A cow or any other animal may be disordered, and the blood contaminated to a considerable degree, and no evident signs of disease while the blood keeps its circulation, till the inflammatory matter strikes or takes its seat; and many that have the charge of cows are deluded by the supposition, that, while they are appetized for their food, nothing of consequence can be wrong; but, as it is from healthy mothers that a healthy offspring can be expected, I particularly recommend farmers to be careful in the management of their breeding cows, and to preserve them as much as possible from the inclemency of the weather, or any other causes that may disorder them; and when disease cannot be avoided, means should be taken to rectify the system before inflammation encroaches, to the injury of mother and calf. Let it always be remembered, it is better to prevent than to cure; and a simple remedy, in time applied, may remove what, if neglected, would require superior skill and expensive medicine to cure. But before I proceed

farther with my remarks, I would wish to remove a prejudice which much prevails in the northern districts in Scotland; that is, if blood be taken from a milch cow, and a purge given, it is supposed it will put the cow off her milk, or diminish it. This idea is most absurd and ridiculous, for I can prove beyond doubt that the reduction of blood, if required, has the contrary effect. I will admit that if blood be taken from a cow while under milk, and a strong purge given, that it will diminish the quantity of milk for a few days, but it will afterwards return more copious than before, and of much better quality.

I would wish it to be understood, that I do not recommend bleeding or purging unless there be cause for it, and then it must be done with caution, and regulated by circumstances. But I will insist on this point, that if the blood be contaminated, and the animal disordered, there is no possibility of bringing the functions of the system to their proper tone, and restoring health, but by the reduction of blood and administering purging and purifying medicine; and many thousands of cattle have died by the neglect of these means, that might have been saved by timely assistance and proper applications.

I perceive, as I go my rounds, that the operation of bleeding is much practised by farmers on their young cattle; but that of giving them a purge is seldom thought necessary, which might prove of more essential benefit to the animal, in many cases, than the loss of blood; and unless the practice of purging as well as bleeding be more generally adopted, inflammatory and fatal diseases will prevail and increase.

I have frequently, in urgent cases, given a strong purge to a cow at all seasons, from the time of copulation, till within a fortnight of calving, with perfect success; but the time I would particularly recommend a cow to be purified by purging, is betwixt calving and copulation. I therefore beg the

attention of those who have the management of dairy stock, to the following advice:—

When cows are far advanced with calf they should be cautiously fed, and turnips should be given rather sparingly and in small quantities; for an extra quantity of cold, watery food disorders the stomach, and proves very pernicious to both mother and calf.

It is also necessary to be careful, in turning them out of the byre, that they get no extra twist to injure them: also drive them gently to water, or to the park; for many accidents happen from bad management, and from very trifling causes.

The moderate use of salt with turnips, or any watery food, is very beneficial for black cattle, particularly for breeding cows as they advance with calf. When they are within about three weeks of their time for calving, I would recommend about four quarts of blood to be taken from the neck; and two ounces of nitre (saltpetre) should be given each day, for five or six days previous to calving; and in about three days after calving, the following purge should be given:—

Glauber salts, twelve ounces.

Cream of tartar, four ounces.

Nitre, two ounces.

Ginger in powder, two drachms.

(One dose.)

The salts and nitre should be dissolved in a quart of boiling water: the other ingredients should then be mixed in. Give it to the animal when about new-milk warm. As the cream of tartar is heavy, and settles to the bottom of the bottle, it should be well shaken immediately before it is given, that the animal may get the whole contents, as otherwise it may cause disappointment in operating.

The medicine should be given in the morning, and the animal should have nothing to eat for two hours previous to getting it, nor for two hours after, at which time a little hay should be given, and water offered frequently. If the weather be cold, the drink should be warmed to about summer heat. Allow three days at an interval, and repeat the purge.

Should the first dose not operate freely, the second should be made stronger, by adding two or three ounces more of salts.

If these simple rules be carefully attended to, before and after calving, and the medicine be given as directed, farmers may then expect their cows to conceive after the bull, and to produce healthy, wholesome calves; for the greater part of calves, for several years past, have been diseased from their mothers, which has been the principal cause of so many dying in infancy.

VALE OF EVESHAM AGRICULTURAL ASSOCIATION.

A resolution having been passed at a meeting of members of this Society, that security of tenure was essential for the prosperity of the farmer, and would tend to the welfare of all other classes, a committee of landlords and tenants was subsequently appointed to draw up a Form of Lease under which a tenant might hold his farm with the greatest advantage to himself, and with due justice to his landlord.

The committee having given due consideration to the answers they obtained from agriculturists in all parts of England to the "Lease Circular" they last year issued, are now enabled to submit to the members for their consideration a form of lease, based upon the experience thus gained. It has been framed with a due regard to both landlord and tenant. The former has full security given him against deterioration of his property, from unskilful or careless husbandry—the latter has as much liberty and freedom from restriction in cropping as it is possible to afford, with due regard to his landlord's interests. The words in *italics* may be altered to suit local or personal circumstances; and the committee believe that the form will be found capable of adoption upon any land, and in any part of England. If there be an objection to granting a lease, the same principles are still applicable to any agreement, however short the term.

ED. HOLLAND.

This Indenture made the day of one thousand eight hundred and forty in pursuance of an Act to facilitate the granting of certain Leases, between A. B. of of the one part, and C. D. of of the other part,

Witnesseth—that the said A. B. doth demise and let to farm unto the said C. D., his heirs, executors, and administrators, all the dwelling-house, buildings, and several closes of land mentioned in the schedule hereunto annexed, and containing by admeasurement A. R. P. or thereabouts, to hold from the day of for the term of *twenty* years thence ensuing; yielding, therefore, during the said term the rents hereinafter mentioned. Except and always reserved out of this demise all coals, mines, minerals, quarries of stone and beds of gravel, timber, and trees likely to become timber, with full liberty for the said A. B., his agent, or others by him authorized, with or without horses, carts or other carriages, to enter upon the said premises or any part thereof, for the purpose of working any of the said mines or quarries, or of felling or taking away the timber, or planting other trees, or for any purpose whatsoever; making reasonable satisfaction to the said C. D. for any injury or damage which the said A. B. may cause in so doing.

And the said C. D. doth hereby for himself, his heirs,

executors, and administrators, and every of them, covenant, promise, and agree to and with the said A. B. his heirs and assigns, in manner following: that he the said C. D. will pay to the said A. B. by two equal half-yearly payments in every year, the first being made on the 25th day of March and the other on the 29th day of September in each year, the following rents, that is to say, in the first year the sum of £ which sum constitutes the value of bushels of wheat, according to the average price of wheat for the seven years ending on the 1st of January next preceding the date of this demise, made up and published as required by law for the purposes of the Tithes Commutation Act; and in every other year during the continuance of this demise the value of a like number of bushels of wheat according to the average price, in like manner made up and published for the seven years next preceding; the rent for each year varying with the average price of wheat during the preceding seven years.

And the said C. D. covenants with the said A. B. to pay all taxes chargeable upon the said premises during the said term, landlord's taxes excepted.

And that the said C. D. will at his own proper cost and charge repair all the house and buildings hereby demised, and also will keep in good repair all the gates, rails, pales, stiles, hedges, ditches, fences, banks, bridges, mounds and drains on the said lands, the said A. B. his heirs and assigns furnishing on the said premises or within miles thereof all rough timber, brick, lime, tiles and all other materials whatsoever for making such repairs.

And that the said dwelling-house and other buildings having been valued by persons of skill at the entry on the said premises by the said C. D. at the sum of £ which valuations are included in the schedule hereunto annexed, the said C. D. shall and will at the expiration of the said term or at the time of his leaving the said premises, whether it be before or after the end of the said term, deliver up to the said A. B. all the buildings so valued in good repair, and shall and will pay to the said A. B. the whole sum by which the said buildings shall have become lessened in value by reason of his neglect to repair the same; and in case any dispute shall arise with respect to the decreased value of the same, such dispute shall be referred to the decision of two arbitrators or their umpire, chosen as hereinafter provided; but the said C. D. shall not in any case be liable for any damage caused by tempests, and a reasonable deduction shall be made for the natural decay and wear and tear of the premises while occupied by him.

And that the said C. D. shall not sell or assign over this lease nor underlet the lands hereby demised or any part thereof unless with the written consent of the said A. B., and shall use his best endeavours to protect from injury by cattle or otherwise all trees or quickset hedges growing upon the said lands, and shall not lop or cut any of the trees so growing, pollard trees excepted.

And it is hereby agreed that at any time in the sixteenth year of this demise, or in any subsequent year, the said A. B. may require the said C. D. to grow such crops on every portion of the said lands as shall be pre-

scribed by the said A. B., he, the said A. B., delivering in writing to the said C. D. the course of cropping prescribed by him; and in case the said C. D. shall object to crop the land as proposed by the said A. B. the point in dispute shall be referred to the decision of arbitrators or their umpire, chosen as is hereinafter provided.

And that the said A. B. shall at all times have power for himself, or his agent, to go upon any part of the said demised lands for the purpose of inspecting the state of repair of any part thereof, and of ascertaining the state of the management and cultivation thereof; and in case the annual renting value of the said demised lands shall have suffered decrease by reason of the said C. D.'s failing to repair or to cultivate the said lands according to the rules of good husbandry, the said A. B. may give notice to quit to the said C. D. at any time before the 25th day of March in any year, and the said C. D. shall quit and deliver up possession of the said lands on the 29th day of September next ensuing after such notice has been received by him; and in that case arbitrators or their umpire, appointed as hereinafter mentioned, shall assess the damages to the land and buildings caused by such breach of covenant, which sum so assessed the said C. D. shall pay to the said A. B. And in case the said C. D. object to quit after receiving such notice, he may require that the dispute shall be referred to arbitrators or their umpire, chosen as hereinafter provided; and if they shall decide that the said lands have not been materially deteriorated by the management of the said C. D. such notice shall be void; and if they shall decide otherwise the said C. D. shall quit, and shall pay to the said A. B. whatever sum the said arbitrators or their umpire shall judge to be a reasonable compensation for the injury done to the said lands by the said C. D.

And that in the event of the said C. D. becoming a bankrupt or insolvent, or of his making any bill of sale or assignment of his estate or effects, or refusing to pay in full the rents herein reserved within one month after the same shall have been lawfully demanded, the said A. B. shall have power immediately to re-enter and repossess the lands herein demised, paying to the said C. D. reasonable compensation for such improvements effected by the said C. D. as have increased the annual renting value of the said lands, the amount thereof being adjudged by arbitrators or their umpire, chosen as hereinafter provided.

And the said A. B. covenants with the said C. D. for quiet enjoyment of the herein demised lands; and that the said A. B. shall insure all the buildings upon the said premises, provided always that in case such insurance shall be rendered void by the said C. D. having on the premises goods of a hazardous nature, or by other circumstances caused by the negligence of the said C. D., he, the said C. D., shall pay to the said A. B. the whole amount withheld by the insurance office.

And that the said A. B. will effectually drain at his own cost and charge every part of the said lands which require drainage, and that the said C. D. covenants to pay an additional rent after the rate of £5 for every £100 expended by the said A. B. from the time of the com-

pletion of the whole or any part of the drainage and during the continuance of this demise.

And that the said C. D. shall and will during the time he holds the said lands under this demise farm them in a good and husbandlike manner, and shall not break up or convert to tillage any of the land marked in the schedule annexed as pasture or meadow land without the written permission of the said A. B. or of his agent lawfully authorized.

And the said A. B. and C. D. mutually covenant and agree that any dispute arising in settling their respective claims in respect to any matter contained in this demise, as well as the several matters herein declared to be referable to the decision of arbitrators, shall be settled and decided by persons of skill, appointed in the following manner; that is to say, the said A. B. shall choose one

such person and the said C. D. shall choose another to be arbitrators, who shall upon being appointed forthwith choose an umpire, whose decision in case the said arbitrators disagree shall be final; and should either the said A. B. or the said C. D. refuse or neglect to choose his arbitrator within a month after being required to do so by the other, then either the said A. B. or the said C. D. shall have power to choose and appoint two arbitrators who shall decide by themselves or their umpire, and such decision shall be equally binding on both parties as if each had appointed one arbitrator.

In witness whereof these presents written on this and the preceding pages are subscribed by the said parties at _____ in the county of _____ and in the presence of _____

MR. NESBIT'S LECTURE ON AGRICULTURAL CHEMISTRY.

SIR,—I have read with attention your report of Mr. Nesbit's Lecture on Agricultural Chemistry; but since the potato philosophy was published to the hitherto unenlightened world, I have a wholesome mistrust of all such matters, and therefore wish to be informed on a point which seems somewhat doubtful.

The lecture tells us that the inorganic parts of vegetables are derived from the ground or the manure, and phosphoric acid is set down as one of those. Now it appears, by the same lecture, that wheat contains from 45 to 48 parts thereof, as will be seen by reference to the table set forth therein; which also shows that only one and a-half can be had from either the Kentish or Surrey manure.

In the analysis of the soil of Norfolk, by Professor Playfair, also set forth therein, we see that only about one-third of a part of this ingredient was in the soil; and as this is stated to be "good fertile soil," it may be taken as a good sample of soils in general.

Now, suppose a crop of wheat to be grown on this Norfolk or any other soil, assisted by this Kentish or any other farm-yard manure, where is the crop to find its phosphoric acid?

Requesting to be informed, for of course it is all right, I am your obedient servant,
TRIPTOLEMUS.

SIR,—Your correspondent, "Triptolemus," has not paid sufficient attention to the table in Mr. Nesbit's lecture, containing our analysis of farm-yard dung, otherwise he would not have failed to have understood it better. Under the head "Per centage of ash" we have the amount of inorganic matter contained in 100 lbs. of the manure or crop. For example, 100lbs. of wheat contain 2½lbs. of inorganic matter. Some samples, however, which we have examined, under Mr. Nesbit's direction, contain only 1·8 per cent., and many wheats contain only 1·3 per cent. of inorganic matter.

The following numbers in the column show the per centage amounts of the different ingredients in 100 parts

of the ash. Thus 100lbs. of the grain of wheat contain 2½lbs. of ash, and 100lbs. of the ash contain 45lbs. of phosphoric acid. By calculation, 100lbs. of the wheat contain 1lb. 2 oz. of phosphoric acid; therefore the grain of a crop of wheat (4 qrs. to the acre, at 60lbs. per bushel) would remove about 2½lbs. 8 oz. of phosphoric acid from the soil. But in general a crop of wheat (straw and all) does not remove from the soil more than from 25 to 28lbs. of phosphoric acid. This, by calculation, you will find can be replaced by from 5 to 6 tons of farm-yard dung, of the quality of that analyzed by us. The ashes of the dung contain nearly 3 per cent. of phosphoric acid, some portion being united to the iron and alumina.

With respect to the soil from Norfolk, it is so rich in phosphoric acid, that, for years to come, crops might be taken from the land without the addition of any phosphoric acid. By Dr. Playfair's analysis, it appears that 100lbs. contain about 38lbs., equal to about 6 oz. of phosphoric acid. This amount of acid is equivalent to 12 oz. of pure phosphate of lime, or 24 oz. of bone-dust. Supposing the soil to be twice as heavy as pure water, and to contain the same per centage of phosphoric acid throughout the field, an acre of land, to the depth of six inches, would contain 4 tons 12 cwt. of phosphoric acid, equal to 9 tons 10 cwt. of pure phosphate of lime, or to 19 tons of common bone-dust. Your correspondent will find that this is an ample quantity for years to come. But this particular soil is a most extraordinary one, for in many scarcely a trace of phosphoric acid can be obtained. And even this immense amount of phosphates would eventually be lost to the soil (unless occasionally renewed), from the continual disintegration of the rain, the action of the atmosphere, and the crops.

We remain, sir, your obedient servants,

ALLEN & GREENHILL.

Agricultural and Scientific Academy,
38, Kennington-lane, London.

ANALYSIS OF THE URINE OF THE SHEEP.

The urine of animals is now pretty generally understood to be valuable as a manure for nearly every kind of crop: but the urine of all animals is not equally applicable to this purpose, as they do not all contain the whole of those substances which our cultivated crops require. The urine of omnivorous animals, such as that of man and of the pig, contains phosphoric acid in combination with the alkalis, and with lime and magnesia; but that of herbaceous animals, in general, is destitute of this important food of plants. The ox and the horse discharge the whole of the phosphates contained in their food along with their solid excretions, so that their urine contains none; and the hare is the only herbivorous animal yet known, in the urine of which these phosphates have hitherto been found in considerable quantity.

It is probably because of the difficulty of obtaining the urine of the sheep that it has not hitherto been examined. I had recourse, therefore, to the butcher, who furnished me with a number of sheep's bladders, containing urine in the state in which they were cut out of the body of the newly slaughtered animal. The contents of these bladders I put into the hands of my assistant, Mr. Fromberg, with instructions to direct his principal attention to its inorganic constituents, and especially to examine it for phosphates. Mr. Fromberg accordingly submitted it to examination, with the following results:—

1°. When evaporated to dryness, 100 parts by weight left 7 of dry matter—or 10 gallons of the urine held in solution 7lbs. of dry fertilizing substances.

2°. This dry matter, when burned, gave off ammonia, and left a large proportion of ash. It consisted, in 100 parts, of—

Organic matter containing nitrogen	71.86
Inorganic or saline matter	28.14
	100.00

3°. The saline matter or ash was composed as follows:—

Composition of the Inorganic part of Sheep's Urine.

Sulphate of potash	2.98
Sulphate of soda	7.72
Chloride of potassium	12.00
Chloride of sodium	32.01
Carbonate of soda	42.25
Carbonate of lime	0.82
Carbonate of magnesia	0.46
Phosphates of lime, magnesia, and iron	0.70
Silica	1.06
	100.00

The urine of the sheep, therefore, contains only a very small quantity of phosphoric acid in combination with lime and magnesia. It agrees very closely in this respect, therefore, with that of the ox and the horse, in which no trace of phosphates has yet been detected. It abounds also, as the urine of these animals does, in salts of potash and soda. It is especially rich in common salt and in soda, which, in the ash, is in the state of carbonate, but which in the urine is, no doubt, combined with some organic acid. *If it be natural to the urine of healthy sheep to contain so much soda, we may find in this one reason why they relish salt so highly, and thrive so much better when it is abundantly supplied to them.*

4°. The organic part contained, as was to be expected, a considerable proportion of urea, a substance which, during the fermentation of the urine, is changed into carbonate of ammonia. The following table represents the entire composition of the urine, both of the inorganic and of the organic parts, so far as time permitted the latter to be submitted to examination:—

Composition of Sheep's Urine in 1000 parts.

Water	928.97
Urea	12.62
Organic matter soluble in alcohol (sp. gr. 0.88)	33.30
Organic matter soluble in water, insoluble alcohol	3.40
Organic matter soluble in weak potash insoluble in water and alcohol	0.10
Organic matter insoluble in any of these liquids	0.15
Inorganic matter, consisting of—	
Sulphate of potash	0.51
Sulphate of soda	1.32
Chloride of potassium	2.05
Chloride of sodium	5.47
Chloride of ammonium	3.00
Carbonate of soda	7.22
Carbonate of lime	0.14
Carbonate of magnesia	0.08
Phosphate of lime and magnesia, with trace of phosphate of iron	0.12
Silica, with trace of oxide of iron	0.18
	998.63

The urine of the sheep, therefore, is to be classed along with that of the ox and the horse. It contains a trace of phosphates; but, like the above animals, the sheep excretes most of the phosphates of its food in its solid droppings. The urine of this animal, therefore, though rich in soluble saline matter,

and in substances yielding ammonia, would not be sufficient of itself to maintain the fertility of any land not naturally rich in the earthy phosphates. It is the conjoined action of the urine and of the solid droppings of the sheep, trodden in together, which renders this animal so valuable a servant in fertilizing the fields of the practical farmer, in so many parts of our island.—Journal of Agriculture.

LETTERS ON SCOTCH BANKING AND CURRENCY.

TO THE EDITOR OF THE FARMER'S MAGAZINE.

SIR,—What hubbub is this which has awakened me? I had thrown away my crutches, and had laid my old bones down, hoping to snatch some repose. But lo! the country is stirring. A "Scotch Coercion Bill" is on the hooks, and I am on my legs again. I could easily alter, in unimportant particulars, what I said last time—Peel attempted to tamper with us, taking us by the button in a friendly way, the more securely to pick our pockets. I could add much additional important matter, no doubt; but *Potato Peel* will not wait till I hobble up. I must just content myself in this case with pinning my former letters round his skirts in the form of a philabeg, and crying after him—"Take care, my fine free-trader (Query—free-booter), that your meditated 'Scotch Coercion Bill' does not make such a quashing in poor Scotland as to win you the additional title of *Bankrupt Bobby*."

Yes, yes; you will have a *Scotch difficulty*, as well as an *Irish difficulty* to amuse you. You will soon tire of such playthings, Master Bobby.

Some people say that the baronet of Tamworth is in delicate health. I wish he could be persuaded to take a trip, in quest of health, to the pyramids for six months, or to inventory the jewels at Lahore. Sir Robert's health *should* outweigh *every* other consideration. I am sure all my friends would be *transported*. A gentleman, recently married, was lately enjoying with his fair one an evening walk along the beach at Musselburgh (a village in the neighbourhood of Edinburgh). "Pray, my dear," said the lady, "what is the difference between *exported* and *transported*?" At that moment a vessel left the harbour, bound for a foreign port. "Were you, my love," returned the gentleman, "aboard that vessel, you would be *exported*, and I would be *transported*!" What could be more graphic! The Premier's health is above every other consideration.

I now take leave to address again to you, my excellent friends, and through you, the appeal I made so lately to common honesty and common sense, and which was then, no doubt, listened to, as of this I have in my possession satisfactory assurances. May it now be so again through your columns.

I am, &c.,

London, March 16th.

OBITER DICTUM.

LETTER I.

"It's gude to be merry and wise,
It's gude to be honest and true,
It's gude to support Caledonia's cause:
Hurra for the bonnets o' blue."

MR. EDITOR,—The declaration of my Lord Melville at the meeting on Scotch Banking, held within the County Build-

ings, on Tuesday, the 21st November, 1844, that Sir Robert Peel, in his (Lord Melville's) belief, had no intention of interfering with Scotch Banking or Currency at present, excited no little surprise at the time, particularly after the preliminary measures adopted by the Premier, with the view of assimilating the currency of the United Kingdom, and suppressing joint-stock banks of issue. Great pains have been lately taken to impress the belief that all intention of *dealing with the Scotch banks and currency* had been abandoned. The object of this attempted deceit has now become very apparent. Sir Robert well knew that it was dangerous to "set the heather on fire," and therefore he deemed it "expedient" to circulate a rumour that his favourite nostrum of assimilation had been discarded. If he persists in the attempt, he will certainly perish in the conflagration. But he has been questioned on the subject, and has given such a Jesuitical reply, as amounts in fact to nothing; for he has openly requested that *no inference whatever may be drawn from it*.

"Sir R. Peel, in answer to a question put by Mr. Macaulay, asking if he felt it to be compatible with his sense of public duty to give any explanation of the intentions of Government with respect to banking and currency in Scotland, said he thought it the best course to reserve all explanation until he was actually enabled to ask leave to bring in the measure itself. He thought that Lord Wharnclyffe's expressions on the subject had been misconstrued; but, added the right hon. baronet, 'I hope no inference whatever will be drawn from the explanation now given'" (a laugh).

He might just as well have remained silent.

The mover of the address, Mr. Charteris, expressed himself on this subject in the following terms. The hon. gentleman was pleased to say—

"The Bank of England charter having been revised during the last session, the banking establishments of Ireland and Scotland ought naturally to undergo a like revision; but though in ignorance of the intention of her Majesty's Government on this point, I may, perhaps, express a hope, that in placing the banking establishment of Scotland on what it considers a sound footing, it will interfere as little as possible with the existing currency, to which the whole nation is so firmly attached. The Scotch £1 notes are *really dirty things*—if I were the right hon. baronet I would not touch them."

In the House of Lords, on the 4th February, 1845, "a noble lord, who spoke from the cross-benches, expressed his regret to find that the Government meant to interfere with the system of currency and banking in Scotland. The whole system of banking in Scotland had stood a severe test. That test had been its great practical success. The great mass of the community, who had ample opportunities of forming a judgment respecting it, had signified their complete satisfaction with the system as it stood. There had been great meetings of Chambers of Commerce, and of persons engaged in trade, as well as county meetings, all of which appeared to be actuated by the same feelings of its advantages. He therefore earnestly

depreciated any interference with that system in order to change what was generally approved. Why, at any rate, should any change be made just now, when no one word was put forth against the system by anybody, when it was admitted to be free from the evils which were complained of in the English banking system? To him, he must say, it was a matter of surprise that any Government should run the risk by interfering or substituting something which might not work so well. These, he was persuaded, were the feelings of the constituencies; they were the feelings of every one of the representatives for Scotland, and they would, to a man, oppose any great alteration of the system; he did hope, therefore, that the alterations which the Government meant to bring forward might be of a trivial nature only, and therefore such as he and others could concur in."

"Lord Wharmcliffe said, he had not intended to trouble their lordships, but he could not allow the objections which had fallen from the two noble lords who had spoken last to go without reply. Then, with regard to his other noble friend who spoke of the anticipated change in the banking system in Scotland, his noble friend had introduced the word 'currency' in what he said, that word not being contained in the speech. The paragraph his noble friend spoke of referred only to the banking establishments of Scotland, and not in the least to the currency (*hear, hear*). But he (Lord Wharmcliffe) would not say a word more, because he should be sorry that anything which fell from him should interrupt the unanimity which prevailed."

Have we at last arrived at the truth, then? The Scotch £1 notes being, according to Mr. Charteris, "*really dirty things*," neither he nor the dainty Premier, we hope, will soil their fingers with them. But people have a peculiar way of judging of men and things in Scotland. It may, no doubt, be owing to their barbarous education and narrow views of things in general; but I know them so well, that I would not wonder if the old fable of the fox and the grapes should steal upon their memories, when they are endeavouring to account to themselves for the Premier's tardy forbearance, as respects the paper currency. *But our banking system is to be tampered with.*

It is broadly hinted in high quarters, that Sir Robert's plan is to restrict the circulation of the Scotch banks to the present amount—tested by the same rule, and for the same period as the English banks, with weekly returns, and regulated in all respects in the same manner; that he will, in a word, propose a lease of nine years of their existing system to the Scotch banks, with their £1 notes continued, and their circulation restricted as above; *but this must be taken as a formal warning of the ultimate suppression of all local paper whatever, and of the prospective adoption of that of the Bank of England, as the sole national issue establishment.* How has Scotland deserved this at his hands? Is it because he has found the representatives of her people, and of their interests, reasonable, compliant, or even facile on many occasions, that he means to practise a little farther on their well-tryed patience and endurance? Is it because Scotland has borne with such exemplary magnanimity and resignation the vile tampering with her courts of judicature, conceived and executed with the overbearing confidence and lick-spittle subservience of ignorance and incapacity, proving beyond doubt, if such additional proof were necessary, that her public men have made merchandise of her public interest, gorging the hungry maws of trumpety dependants, bartering her freedom for place, power, patronage, and parliamentary support, with unblushing effrontery since the days of Melville—proving, moreover, beyond doubt, that in the Imperial Cabinet there ought to sit a special Minister for Scotland, to protect her national institutions, her laws, and her interests, other than a mere law officer, whose duties should be distinct and se-

parate? We want a statesman of large and liberal views, with sufficient expansiveness of comprehension and purpose, decision of aim, and effectiveness in execution, to accomplish the preservation of all that is revered and valuable in our laws and institutions, and to elaborate their improvement, where desirable, with a steady eye to the legitimate necessities and demands of the people of Scotland; but never losing sight of English connexion and English interests, and the obligations, whether of friendly duty or of compact, which they of right impose upon us in our deliberations. It is utterly impossible that a Scottish lawyer, whose only aim is to scramble to the head of his profession, can have either the leisure or the opportunity to acquire the peculiarly and characteristically lofty and far-seeing general and comprehensive knowledge which, at the slightest effort of the will, when any point of difficulty occurs, can recall from the past, and summon for the present, existing practices of government over Christendom, every available precedent which may serve either as a beacon or as a guide to lead to a just constitutional decision. Name to me the first law officer of the Crown (and I can say it, I think, without disparagement or offence, even taking them at their own estimate of themselves), acting, as such first law officer does, in fact, as Minister for Scotland, who, for many a day, could make any pretension, or lay any claim whatever, to be regarded as possessing a title of that knowledge which goes to constitute the enlightened statesman and legislator. We know the wily policy of England—we know it well, and have long done so. *It is a settled point that Scotland must become as a province, or a county of England*; and the juggling statesman who can most speedily accomplish this, will be England's most favoured son. Short-sighted England! Vain glorious sister! I can tell her Minister, however, if he persists in persecuting conscious and unoffending Scotland, that from the smouldering ashes of her glory a flame may yet arise—a flame of indignation, may it never prove of vengeance—which with its thousand tongues of living fire will blight, wither, and utterly consume the reputation of that ruthless adventurer, whatever may have been his previous reputation, who will dare to pluck with unquestioning, disrespectful, and unrelenting rudeness, or to fish away with furtive and unworthy duplicity, those few venerated institutions still spared to a pillaged nation, the last remaining shadows of *native prosperity, national and distinctive.*

"I say, Johnny Bull—hurrah, hurrah!

Eat and drink till you're full—hurrah, hurrah!

When the proud Scottish thistle your Bullship would pull,
Remember the prickles—hurrah, hurrah."

Is it because Scotland has stooped to the infliction of the Jury Court, that yawning whirlpool of destruction, which the judicious litigant or conscientious agent would avoid approaching as he would another *Charybdis*, the expense and uncertainty, on every occasion amounting to a positive denial of justice, which was said to resemble the garden of Eden, in that it had been made for an *English Adam*; but in every other respect more nearly resembling the valley of the upas tree, blasting and withering—visiting with ruin and destruction every unwary stranger who dares venture within its blighting influence? Is it because she has silently acquiesced in the abstraction and transference to London of nearly all her public offices for the collection of revenue, and for other national purposes, thus withdrawing a large amount of money which was wont to pass through the coffers of her banks, and which powerfully contributed to the general prosperity of the country? Is it because she contributes five millions a year to the imperial treasury, while her public expenditure is a mere bagatelle—requiring, as she does, neither troops nor coercion to compel an outward observance of loyalty and order? Is it because she has never

spoken out with revolutionary vehemence, declaring her interests, and in her own behalf, distracting the Minister of the day, and overwhelming his counsels—but has ever rejoiced silently, as is her wont, yet heartily, to witness the prosperity of her fair sisters twain (England and Ireland); and without murmur or complaint, has ever generously contributed her own quota to the common treasury, without enquiring very particularly whether her fair sisters might not have been somewhat extravagant in their habits, and very begrudging and shabby to her personally, in apportioning and doling out her share of the common income? Is it because of all this they call her notes "*really dirty things*," although they have always been worth twenty shillings, when those of her wealthier and fault-finding sisters would scarcely pass for more than fourteen? Is it because Scotland managed her bank business so well, and kept in such good credit in the most perilous times, as always to maintain her paper at par, even when her wealthier and fault-finding sister was wallowing in bankruptcy, and her paper with difficulty exchanging her fourteen shillings in the pound, that she is now to submit to be told by that improvident sister, with the most brazen-faced assurance, that she knows nothing about the matter, but must take advice and example from *her*? The fact is, that, after a hard struggle, this improvident fair one has got out of the dirt; and, instead of thanking her kind sister, Scotland, who helped her out, she points with the basest ingratitude to a few minute spots of mud, which necessarily fell upon her humane sister's garments, as she laboured, with that Christian philanthropy, that high and chivalrous daring, that firm and unextinguishable friendship for which she is renowned, in the very disagreeable and perilous task of dragging her sinking sister from out of the mire and filth of the slough of despondency into which she had so imprudently and recklessly plunged. What has Scotland done, I ask, to justify the strong measure of depriving her of the local management of her own affairs, tampering with her laws, her institutions, and the procedure of her courts, which are, confessedly, both in principle and practice, immeasurably superior to those of England? What has she done that yet another affront must be put upon her?—that after every expostulation, after the clearest and most convincing reasonings and explanations, after the formal approval of those reasonings and explanations by her entire representative body, her entreaties are to be disregarded, and she is to be haughtily commanded to be silent—to sit down quietly upon her native heather, and submit without a murmur, in all the freshness and buoyant vigour of her youth and beauty, to the immediate extraction of the last pair of her beautiful teeth left in her disfigured and lacerated jaws, with which to masticate a scanty meal for the sustentation of her sore persecuted and suffering body.

Sir Robert, I prithee, mark me well. Thou canst not succeed in any attempt on the banking system of Scotland, without a most determined, a most terrific struggle, for which thou art little prepared, as thou knowest not what thou hast to encounter. Scotland is perfectly on her guard. She knows her danger. She knows, too, the subtlety and skilful practice of the *physician* who would prescribe for her. But she has never called him in. She is in perfect health, and needs not the aid of physic. Scotland is reasonable and patient. Scotland prides herself on her reputation for good sense and respectability. But she cannot—nay, will not—submit to be ruined to gratify the vanity or dictatorial humours of any prime minister, however she may respect his talents or integrity. She may regret his errors of judgment; she may grieve to find that the highest of intellectual powers and practical abilities are occasionally subject to the temporary domination of the most palpable and untenable fallacies. But while, as is only becoming her good

sense and high-minded generosity, she is willing to make every allowance for the acknowledged imperfections of humanity, she is not such a fool as to sit still in her chair, shaking her head and twirling her thumbs, weeping and moralizing by turns, with ruin staring her broad in the face, when she knows that a zealous, determined, vigorous effort, coupled with a firm, temperate, respectful remonstrance, based on truth and founded on justice, may and must succeed (if our friendship is to hold together) in averting from her devoted head that weapon of destruction which at this anxious moment hangs suspended over it by a single hair. But if Sir Robert will only permit fair Scotland to argue with the benefit of this single hair of dubiety which intervenes between her and agricultural and commercial destruction, she has no fear whatever, as she is wont to express herself to her sons and daughters, when within her sporting lodge in Glen Tilt, that she shall have found "a hair to mak' a tether o'."

Mr. Charteris has had the politeness to say openly in the house that the Scotch notes are "*really dirty things, and that if he were the right honourable baronet, he would not touch them*." No doubt Scotch bankers were not defaulters on an extensive scale, like the English bankers. They cannot boast of swindling on such a comprehensive and gentlemanly scale as English bankers. They only did business in a petty, huckstering, retail way. Their notes are poor dirty notes; their circulation, a poor dirty circulation; their system, a poor dirty system; they themselves, poor peddling bodies. We shall relate to Mr. Charteris what happened on a time in "Auld Reekie." Some time ago, two culprits were conveyed to the Grassmarket for execution; the one was a highwayman of high character in his vocation—a stately, well-dressed fellow; the other was a poor pitiful thief, who had been a tailor. The highwayman mounted the cart with an air of freedom and consequence, determined to be *hanged like a gentleman*. The thief caught his manner, and ascended the vehicle with as much ease and dignity as if he had been something more than a tailor, and took his seat close by the side of the highwayman. This was too assuaging. The highwayman edged off a little, the thief edged on: at last, as a silent hint was insufficient to make the tailor keep his distance, the *gentleman*, when they arrived at the Grassmarket, spoke to him, and begged him to stand off, for that he was "*a dirty fellow, and stunk abominably*." The reflection was so provoking, that the tailor cried out, "Hey-day! what the devil is here to do? Don't be so proud; *I have as much right to be here as you have*." If Scotch bank notes are "*really dirty things*," will Mr. Charteris be so kind as to inform us whether the notes of the Bank of England are not equally so? The Bank of England did not think it beneath her dignity, *when it suited her*, to issue one-pound notes. Why should not the Scotch banks do the same, as *it suits them best, and has been their uniform practice for centuries*? A Scotch bank note has a good right to say to an English bank note, "*I have as good a right as you to be here*." If the English bank note say to the Scotch bank note, "*You are a dirty fellow, and stunk abominably*," this would be something like the pot calling the kettle black. This is, no doubt, a very dirty comparison, but not nearly so dirty as Scotch bank notes, according to Mr. Charteris. Oh, the odious "*really dirty things*!" Never mind. They have made Scotland.

There is nothing whatever to cause alarm to the most cautious and long-sighted in the prospects of Scotch banking, *if let alone*. We have heard of people being frightened at their own shadows. As it has occurred to me, and that I am in the humour, there can be no harm in telling of an occurrence of this kind, that happened in the country parish of a reverend friend of mine. A foolish fellow went to the minister, and

told him, with a very long face, that he had seen a ghost. "When and where?" said the pastor. "Last night, I was passing by the church, and up against the wall did I behold the spectre." "In what shape did it appear?" replied the priest. "It appeared in the shape of a *great ass*." Go home, and hold your tongue about it," rejoined the pastor; "you are a very timid man, and have been frightened by your own shadow."

I wish to heaven these English *Solons* would take the minister's advice!

Sir Robert and his junior skirmishers, whom he puts forward as sacrifices on every occasion of danger, before the main battle comes up, had better desist in this unprovoked attempt at national pillage. There is no plausible pretext whatever for picking our pockets, or robbing our money-chests. Our sturdy banking fabric is entire, and in good repair; and he has no right whatever to attempt forcible entry, with his *mind made up beforehand to condemn it*. There are those in Scotland who will hang upon his heels with the desperate fidelity and pertinacity of a native terrier, to gall his ribs and alarm the neighbours, so long as he persists in attempting a forcible entry; so that it would be manifestly "expedient," in such circumstances, for him and his burglarious myrmidons to show a clean pair of heels, with whole skins, while it is yet in their power.

Another word in his ear. He and his myrmidons need not flatter themselves that the insignificance of the writer will form his and their safeguard. He need not think that my words will fall unheeded, like the snows of night on the heights of *Morven*. "And Scotia's favourite bairn" hath written in letters of fire—

"What though on simple fare we dine,
Wear hodden gray, and a' that,
Gie fules their silks, and knaves their wine—
A man's a man for a' that."

I have already hinted that we have peculiar notions in Scotland. My cause is the cause of "braid Scotland;" and "every man and mither's son" will swell the cry, till all and every ignorant theorist, however learned, in common phrase, they and he may be, yet egregiously and notoriously ignorant, at least as regards the peculiar wants of Scotland, who plot directly or indirectly to annihilate or undermine "our sainted mither's" prosperity, shall scamper off in terror and dismay, and clear the border, like lusty fellows, at a single leap; and when they reach Whitehall, they will be relating to their assessors, in a suppressed and tremulous whisper—

"They raised a wild and wondering cry
As with his guide rode *Bobby* by.
Loud were their clamorous tongues, as when
The clanging sea-fowl leave the fen;
And, with their cries discordant mixed,
Grumbled and yelled the pipes betwixt."

We have not forgot how to raise the *slogan* or circulate the *fiery cross*. We have swift *gillies* in thousands, by mountain, wood, and stream, ready to "rin till they fa'" when their *mither* is in *travail*. But it will be long before they "rin for sic a *howdie*" as Sir Robert Peel, unless he should adopt some new rules of practice. When he is called in to prescribe for a lady in *travail* (for instance, the fair genius of Scotland), he has no business to attempt her ruin. If he does not take care, we shall be bound in honour to caution *some other friends*. I would beg to inform the right honourable baronet that her Majesty's post runners, under her Majesty's most gracious sanction, are now the messengers of the *fiery cross* in Scotland, and that they bear it alike to the door of the peer and the peasant. The press of Scotland, with their assistance, when

necessity demands it, has assumed the functions, and now performs the duties, of the multitudinous messengers of the *fiery emblem*. And that authoritative and powerful pen, which habitually inculcates peace and good order, when country or institutions are recklessly and wantonly maligned or assailed, will be found to have changed, as if by magic, its very character and substance, and to cut with the insatiable and unsparing keenness of a Highland broadsword.

No modern manufacturer, or manufacturer's son, the *living personification of free trade run mad*, showering her sovereigns and silver pieces, to boot, in the face of every nation of Europe and of the wide world, without being able to show one single sixpence on the creditor's side of reciprocal advantage to excuse it, shall dare to trample on the prostrate body of our venerated parent with impunity. Have a care, *Sir Quixote*. We are prudent; we are patient; but we are brave.

"Oh, ne'er on battle-field throbb'd heart more brave
Than that which beats beneath the Scottish plaid,
Or when the pibroch bids the battle rave,

Or level for the fight our arms are laid:
Where lives the desperate foe that for such onset staid?"

I may, perhaps, proceed to show, in a very few words, what is known to every man of average ability and information on this side the Tweed, "and to a gude few *ayout*"—viz., that our banking system, whether in theory or in practice, is equally unassailable. Is it possible to give Sir Robert Peel credit for ignorance on this point? No, it is not ignorance; it is pride and prejudice that goads him on, coupled perhaps with a half-breathed pledge—with all his prudence, made prematurely—with his eyes fixed on England as a prominent foreground, every interest of hers and their relations clear and striking; and with Scotland looming dimly in the background, veiled in her native mists, and therefore so distant and insignificant in the view of the contemplative Premier, as not to be worthy, everything considered, so long as she brooked such indifference, of a nearer approach, to facilitate a more narrow, searching, and perfect investigation into the interests, necessities, partialities, or, if you will, national prejudices of her loyal people.

I am, &c.,

OBITER DICTUM.

LETTER II.

As for the discontented fool,
Who fain wad be oppression's tool,
May envy know his rotten soul,
And honest men abhor him.
May dule and sorrow be his chance,
Dule and sorrow, dule and sorrow,
May dule and sorrow be his chance,
And evils, a great store o' 'em.
May dule and sorrow be his chance,
And a' the ills that come frae France
Be his, wad lead our banks a dance,
And play them snip—snip—snorum.

MR. EDITOR,—I now proceed to show that our Scottish banking system, whether in theory or practice, is equally unassailable. Is it, then, that our persecutors envy the last remnant of our national institutions? or that they are the mouth-pieces of those who envy them? or are we to take this projected interference with our banking system as an act of pure unprovoked oppression? I do not pretend to be in possession of any secret or mysterious knowledge. I do not claim the merit of any brilliant novelty to recommend me; I am a plain sort of person, and openly declare at the outset, that the facts and views I am about to state are possessed and admitted by every rational man on this side the border, who is prepared to declare, upon his honour, that he has given adequate attention

to the subject, and who is not led, and has no reason to be suspected of being led by party, or other interested bias. I make no pretensions to discovery, as our persecutors have done. I have no wish to go either a wool gathering, or a hunting for mares' nests. I had thought our persecutors had more pressing business on hand at present. As if Irish discontent and disaffection were not sufficient, they have, in spite of all their caution, drunk up the subtle poison which their false friends had placed temptingly before them to work their destruction; knowing well, as those false friends did, that in spite of their silence and reserve, our persecutors were in reality athirst, and in a fever of anxiety and doubt; and as *old Joe* used to say, "must soon have som't to drink." I warn them that if they should persist in draining this cup to Scotland's prejudice, they will certainly have good cause to date from that moment the decline of their influence in Scotland; and who can foretell that this may not lead to their eventual political dissolution?

I shall, in my present communication endeavour to show that the *Scottish public and the United Kingdom have ample security for the amount of issues of the Scotch banks—that the Scotch banks cannot, and never did overissue—and that the hypocritical cry of justice to England and to the Bank of England is, without going about the bush, nothing better than GROSS UNADULTERATED HUMBUG.* If my present communication should extend too far before I can accomplish so much, I shall continue the subject, with your permission, in your next number, and if you should be disposed to afford a place to the series, I shall not drop the subject, until, if not from an innate sense of justice, then out of pure shame, or the craven fear of political annihilation from the consequences of their threatened measures, our persecutors, impelled by new begot settled conviction, impressed by many casual warnings from many influential quarters, shall have spared Scotland this right dishonourable dishonour—this discredit and very bungling attempt at administering a *national emetic*, with the view of compelling us to disgorge the well earned contents of our treasuries, both public and private, that England may have the filthy treat of licking them up again; in fact, with the single purpose of surfeiting the hungry and gluttonous stomach of insatiable England. We never heard of such gluttonous tastes, practices, and propensities before out of a dog kennel. We cannot contain our indignant disgust at such hypocritical greed, such unreasonable and palpable injustice. Do not teach Scotland to sympathise with Ireland in the cry against the *Saxon*. Surely, a certain right hon. baronet must have mislaid his caution lately.

Before proceeding to our subject, we must say a few words. It is highly probable that the men of Scotland—"from Maiden-kirk to John o' Groat's"—will speak out in words, to be followed up by actions, we fear—if sufficient provocation should be given—not to be misunderstood. We have given our persecutors full warning. It is unquestionable that it is egregiously impolitic to concuss the Scottish nation at this moment. If they should persist in doing so, they will speedily be told, that they neither represent them nor their interests. Some who do not know any better, might be led, or inclined to argue—if their Sovereign should, unfortunately, listen to them instead of her loyal Scottish subjects—that they will thus be freed from their allegiance. Do our ruthless persecutors think there may not be danger here? There may be some who will say, we gave a King to England, otherwise we never should have consented to the union, and only agreed to it on condition that our reasonable wishes, as to *local interests*, should be scrupulously, faithfully, and conscientiously attended to. If there should be clandestine crime, and secret outrage in the country, our persecutors must answer for it. If

Scotland, from a peaceful country, should become another Ireland, our persecutors must answer for it—*ay and feel it*. Our interests—our prosperity—our all is at stake. Will those persecutors, then, have the assurance to say that they can justly blame or utter a single complaint with any hope of sympathy, either at home or abroad, after the timeous warning they have received? If they should persist, an appeal will be made from them to their Sovereign in behalf of injured Scotland—her favourite Scotland—that interesting and romantic land, which has at length been fortunate in finding a Sovereign youthful and lovely—tender and noble-hearted—capable of appreciating alike the sublimity and grandeur of her territorial features, and the high and lofty daring of her chivalrous and heroic sons. *VICTORIA is Scotland's idol*. Will that living and loving idol patiently permit the destruction and abstraction of the revenues of her favourite Temple? Will she look on with apathy to see her dutiful and loyal worshippers despoiled? We do fear for her gracious reply—her gracious interposition. She must be heartily sick of the eternal sing song of free trade, producing nothing more interesting than the humiliating spectacle of her own Ministers going begging round the world, with humble entreaty and heads uncovered, but, like many other beggars now a-days, *never a lucky penny coming into the hat*; no stranger being so simple as to pay for an old song about free trade, when they can stand by, and listen, and enjoy the melody, with their hands thrust deep in their pockets, while they whisper in amazement, can these foolish minstrels be the Ministers of England? can these be politicians? and, if so, of what school? Who sing for the benefit of the world, and when they demand some payment, exchange, or what they elegantly denominate *reciprocity*, though sternly and contemptuously refused and repelled, sing on more blythly and lustily than ever, in the pride of their talents and accomplishments. The astonished nations, exclaiming in wonderment, "*we could never afford to do this!*" Anything in the way of a fair exchange, we comprehend." I must say that, though no man who knows my sentiments, will accuse me of want of liberality, politically speaking, I do not, and cannot, admire the results of our free trade policy hitherto. But which of the two is the system to blame, or its practical administration? I consider free trade an open subject. I consider Scotch banking, the poor laws, and *justice to Scotland*, open subjects; and I firmly believe that the Cabinet is divided, or, at all events, is neither cordial nor heartily unanimous upon them.

But now for our subject. When the bank charter was under parliamentary discussion last May, Sir Robert Peel proposed and carried important changes and modifications in the regulations of the English banking and currency, declaring that, for the present, he should say nothing about the issue of small notes, but reserved for future legislation the system of banking in Scotland and Ireland. His avowed and declared object in making the alterations was to provide against imprudent over issues in times of prosperity, and sudden and excessive contractions in times of panic, to the injury of the public and the imminent peril of the Bank of England. These precautions may have been perfectly necessary in England, as I shall plainly show before I have concluded my letters to you, sir, on this subject; but such precautions are inapplicable, unnecessary, utterly uncalled for, and therefore must be regarded as insufferably intrusive, and, if persisted in, absolutely insulting to the entire public of Scotland. The English private and joint stock banks *did certainly* contrive to manage their issues in the most reckless manner, spreading periodical disaster and ruin over the length and breadth of that "*merrie land*." But can any such charge be brought against the Scotch banks?

For a century and a half the Scotch banks have enjoyed the

privilege of unlimited issue. Have they ever abused it? The average *circulation* for the last three years has been about THREE MILLIONS for a *population* of TWO MILLIONS AND A HALF; whereas in England and Wales there has been a *circulation* of nearly THIRTY MILLIONS of *paper money* and TWENTY MILLIONS of *metallic currency* among a *population* of SIXTEEN MILLIONS. Can our persecutors contradict this? The total circulation of *notes* in England, for the month ending February 1, is as follows:—Bank of England, £20,558,920; private banks, £4,576,895; joint stock banks, £3,134,351; besides the metallic currency.

The *subscribed capital* of the Scottish bank is upwards of TWELVE MILLIONS, surely a *sufficient guarantee* for a *circulation* of THREE MILLIONS. Can our persecutors deny this? If not, what apology can they possibly be prepared with, for treating us all like bankrupts, incompetents, and swindlers. Can they be ignorant of the *self imposed* checks of the prudent and conscientious Scotch bankers? Are they aware, that this, of itself, renders over issue impossible? Are they aware that, in Scotland, the moment a banker receives, in the course of his business, a rival banker's notes, he loses no time in exchanging them for any notes of his own that may be lying in that rival banker's hands, and that have been received in the like manner, in the course of business; and whatever difference or balance may remain over on either side, is instantly paid in cash, or when the amount renders it more convenient, cancelled by the transfer of available securities? Do they know that it is the interest of rival bankers *thus* to diminish the circulation, and any over issue of their rival's notes? Is it not plain that a banker cannot profit by holding his neighbour's notes? They are unproductive to him, and therefore he loses no time in returning them to the issuer. Are our persecutors aware, that under the Scotch system, no provident man, within reach of a bank (and there are banks in every considerable village), ever thinks of keeping a spare note in his possession over night, but pays it into his credit that he may enjoy the interest? This also keeps down the circulation. So that these two checks—viz., the immediate exchanges of notes which take place between rival bankers, and the public inducement held out to all holders of notes whatever, to pay them into the nearest bank that they (the depositors) may enjoy the interest allowed on all such payments, are two most effective checks on over issue, depending upon self interest for the certainty of their operation, a more powerful stimulus, we opine, than any other which even the fine spun uniformity theories of our ingenious persecutors can either devise, create, or bring into useful operation. These ingenious gentlemen, however high may be their estimate of their own powers, had better not commit the folly of setting up a rival workshop to human nature, to fabricate checks and restraints, more powerful, more effective, and of more certain operation than *self-interest*; otherwise they will make small progress in convincing the matter-of-fact native of Scotland, who has long been honoured, or if not honoured, then distinguished by the title of "*the canny Scot*."

But, besides all these guarantees, which I have already noticed, and which one would think sufficiently ample, we have the farther security arising from the fact, that the whole proprietary body of a Scotch bank are bound to a man, and to the last farthing they are worth, for the debts of their company; and that, in this country, where a stern sense of justice and equity prevails, and where our laws are based on the dictates and principles of honesty, the real, as well as the personal property of a defaulter, is attachable by a very summary process, and rendered immediately available by a creditor in extinguishing his debts of every description. Can these ingenious—would I could say ingenuous—gentlemen, give us any

good and sufficient reason, in justice, why this should not be the case in England as well as in Scotland? They should set about studying the admirable provisions of our Scotch laws, before they attempt to improve upon our institutions. They need not, in their arrogance, pretend to sneer at this our recommendation. We are only commending the principles of everlasting truth and justice. Can they afford, as public men, to sneer at these? I ask them, if it is decent to see a man (as you may see a thousand at any time in England) rioting in prison on the income derived from his *real property*, while he defies and laughs to scorn his *personal creditors*? And this under the sanction of the laws of England! We have no such English justice and decency in Scotland. I may add too, that in Scotland, the moment that bank notes are tendered in payment of a debt, all legal proceedings and expenses cease; whereas in England an act of Parliament became necessary to oblige a creditor to receive Bank of England notes in satisfaction of a debt, at least to the extent of staying legal proceedings. Is this, of itself, not sufficient evidence to any sane man, of the perfect stability of the Scotch banks and of the unbounded confidence of the people in them? Will our ingenious persecutors be disposed to stultify their common sense by denying it?

I have shown that the people of Scotland, and of the United Kingdom, are amply guarded against all loss by a permanent guarantee of *twelve millions* of subscribed capital, to cover less than *three millions* of issues. That *over and above* this, in Scotland the real and personal estates of the individual proprietors are attachable, by a very summary process, for the entire debts of any banking company with which they may stand connected; affording, if it were necessary, a *farther* ample guarantee to the public, that *over issuing is impossible*, from the very effective, self-imposed checks I have already explained. And if any *further* check against over issuing were necessary, it exists in the inducement held out to individuals, by the Scotch banks allowing interest on the smallest deposits; thus operating as they do, in fact, as national savings banks—giving a death blow to hoarding, and calling intelligibly on every man to return any notes that may come into his possession, immediately to the nearest bank, that they may *there* fructify to his advantage. Are all these checks not a sufficient safeguard against over issuing? I have also shown, by one simple statement, the *perfect confidence of the people of Scotland in these banks*.

Again, then, I repeat the question with which this communication opens:—*Is it that our persecutors envy this last remnant of our National Institutions? or that they are the mouthpieces of those who envy them? or are we to take this (projected) interference with our banking system as an act of pure unprovoked oppression?*

As space will not permit, at present, I shall, in my next, endeavour to show, that the hypocritical cry of *justice to England, and to the Bank of England* is, without going about the bush, nothing better than GROSS UNADULTERATED HUMBUG. *Sawney* has read somewhere of the protection the vulture gives the lamb. But his persecutors will please bear in mind, that *Sawney* is no sheep to have his bones picked.

In a word, this *act of uniformity*—this barefaced national pillage—will not go down in Scotland.

I am, &c.

OBITER DICTUM.

(To be continued.)

THE LONDON FARMERS' CLUB.—MONTHLY MEETING.

IMPROVED FORM OF FARM LEASES.

The usual Monthly Meeting of the London Farmers' Club was held on Monday, April 6, in the rooms of the Society, at the York Hotel, Bridge-street, Blackfriars; Mr. Baker, of Writtle, Essex, in the chair.

Mr. BEADELL, in rising to open the question, commenced by saying, that he thought they should all agree in this—that of the many subjects which interested the agricultural world, there was none of greater importance than that which related to the bargain to be made between the land owner and the land occupier (*hear, hear*); and it was upon the way in which that was carried out, that much of the prosperity of both must depend (*cheers*). They must admit that this bargain ought to be mutually binding; that was to say, that it should be so framed as to prevent the tenant from committing waste upon the estate of his landlord, at the same time giving him all the liberty and all the rights that he could enjoy short of that (*hear, hear*). Now, leases, as at present drawn, did not secure this object. They found leases teeming with reserved rents and shifts, but very little appeared in them which had the effect of securing to the landlord what were his just rights, and of giving liberty and elasticity to the operations of the tenant (*hear, hear*). He (Mr. Beadell) apprehended that in dealing with the tenant, the point next in importance to the lease itself was the term of the lease; and they could hardly go into any county without finding that the terms of leases varied. They had in some counties the term of seven, in others fourteen, in others again twenty-one years; and in Scotland nineteen years was the favourite term. Why it should be so he knew not, but so it was; that period appeared to suit very well, and it generally secured to the landlord a good, honest, industrious and improving tenant (*hear, hear*). They could not expect that the tenant would employ his capital and go into improvements of his farm unless he had fixity of tenure (*cheers*); and that not such as would merely enable him to derive back the money which he had put into it; but such as would give him a profit, and a good handsome profit, into the bargain. If they considered how few years would suffice to enable the tenant to get back his money, he did not think there would be much necessity for legal leases. But he held, that the enterprising tenant who brought his knowledge to bear in improving the property which he farmed, was entitled to a rate of profit far beyond what the mere interest on his money would afford him (*hear, hear*). In going into this matter, the first part of the question was, the legal matter of the lease. But as the law was not their business, they must leave it to the lawyers to give effect to that portion of a lease which was binding between man and man (*hear*), and go on in harmony in endeavouring to carry out that which they had in view. They all knew

as well as he did, that the farmer was in most cases tied down to a certain course of cropping; very ordinarily to four courses, namely, one-fourth to naked fallow, one-fourth to spring corn, one-fourth to clover, and one-fourth to wheat. He mentioned this for the purpose of showing the absurdity of the system. There were, of course, variations from this plan; some where green crops, turnips, and other things were allowed to be grown in fallow, and others where beans and peas, with clover, were allowed to be taken. But he had met with many instances of the plan he had first mentioned, although they knew that the system of naked fallows was pretty nearly exploded. He recollected an instance in which the proviso of naked fallow appeared in the lease, and he called upon the party in order to speak to him upon the absurdity of it; and also to remonstrate on the absurdity of tying down the tenant to put down clover once in every four years. The reply was, that the tenant must plant his clover, and if it did not take, he would then be allowed to put in peas and beans. Thus, the tenant would in that case be called upon to spend 10s. or 12s. an acre without any benefit whatever to the landlord (*hear, hear*). He mentioned this as a specimen of cases which had frequently come across him. Leases containing these objectionable provisos were drawn and persisted in time after time, and he (Mr. Beadell) could only account for it in this way, that the old form of lease was handed down from generation to generation, and adopted, whether conformable to the wants of the present day or not. The family lawyer was called in to draw a lease, and the old, musty record—which did all very well at a period when farmers could neither read nor write—was got down, and a lease drawn according to its prescribed form; and if the tenant remonstrated against any of its obsolete provisions or covenants, the reply was, "If you do not sign that, you can't have the farm at all." Well, what was the consequence? Why, the lease was signed for the sake of getting the farm, thrown into the bureau, and never thought of any more until the tenant was about to quit it (*hear, hear*). His experience was, to a certain degree, limited upon these points. But he knew that frequently, when the tenant was about to quit his farm, and when the lease was read, and covenants which he ought to have observed were pointed out to him. He remarked: "Oh! I never looked at that!" (*hear, hear*). The lease, in fact, under such circumstances, became a dead letter until the end of the term for which it had been taken, and the conditions were enforced, and the tenant was made subject to covenants to which he ought never to have been subjected. If these objectionable clauses could, by any means which they could devise, be substituted by more plain and un-

understandable ones, which tenants could and would act under, why they should accomplish a great and permanent good. In some leases there were covenants for reserved rents of as much as 10*l.* an acre for certain offences. Now, all these things ought to be, and should be, got rid of: the punishment bore no proportion to the offence. The tenant certainly ought not to do anything in opposition to his lease; but if he did, he ought at least to have the same amount of justice measured out to him as a person would in one of the criminal courts, where the punishment would only be proportionable to the offence (*"hear," and a laugh*). Reserved covenants would doubtlessly be well got rid of altogether. He did not think there was any great objection to the system of imposing penalties; for if a penalty were conditionally imposed, say of 50*l.*, 100*l.*, or 200*l.*, why he did not so much object to that, as it only, in point of fact, meant a penalty to cover the amount of damage done to the estate by the misconduct of which the tenant might have been guilty (*hear*). It was said that it was much more easy to find fault than to mend; however, thinking it might be useful, he had turned his attention to what a lease ought to embrace; and he would take the liberty of very shortly stating the sort of lease which would accomplish the objects which they had in view, namely, to secure the rights and interests of the landlord, and at the same time to give liberty and elasticity to the operations of the tenant, and enable him to do those things which it was so desirable to do at the present day. In the case of every lease with which he (Mr. Beadell) had anything to do, he should like that it should be short; he had in the way of business frequently to read over leases of five, six, or seven skins, and he was of opinion that a lawyer must be badly acquainted with his business who could not draw a lease in one skin. The conditions might be made equally stringent, whether the lease occupied one skin or six (*hear, hear*). He would just mention one case, which had occurred very near to the place where their excellent chairman was born:—A tenant had had some dispute with his landlord, and came to consult him (Mr. Beadell) as to what he should do, as there was about to be an action at law in the case. Now his lease happened to occupy five skins, upon ascertaining which, he said to him—“There is only one chance for you, and that is this; I never yet knew a lease of five skins, the beginning of which did not contradict the end” (*"Hear," and a laugh*); and so it turned out, and that saved the action (*hear*). There was, in almost every lease, very much more formal matter than there need be. All that was necessary might be accomplished by two descriptions of covenant; he would call the first the “covenant of forfeiture”—that was to say, if the tenant chose to offend with his eyes open, there should be an absolute forfeiture of the lease; because they would scarcely ever find a good farmer in such a position. They would not find a farmer who had a large amount of capital, and was really able to pay his outgoing, put himself in such a situation where there were reserved rents or penalties, as to run the risk of forfeiture. As parts of the covenant of forfeiture (although no great friend to timber), he would include the

act of cutting down any timber without the permission of the landlord, or of breaking up any land without such permission; and also insolvency, assignment, or non-residence (*hear*). The next description of covenant which he proposed should be inserted, was the “covenant of compensation.” In that he should include only one cropping or mowing grass or clover without an extra artificial dressing, for he did not think it answered to mow twice; but if the farmer chose to mow grass or clover twice, why then he should give the land an artificial dressing (*hear, hear*). He should certainly also think it an offence if the tenant took two white straw crops. With regard to manure, he thought the tenant ought to be compelled to bring upon the land a quantity of manure equal in value to the hay or straw which he took off when converted into dung. He would make the same covenant binding as to green produce, the neglect of scouring ditches, keeping water-courses open, &c. Now, he was far from thinking that he had embraced all the matters which ought properly to come under these two heads. He had merely shown that there were certain acts which ought to be made covenants of forfeiture, and certain others which ought to be matters of compensation; and if any damage were done, it should be paid for by the party who did it. He thought, too, that there should be in every lease a clause allowing the tenant to remove all buildings which he might have erected upon the farm during his occupancy, if the landlord and the in-coming tenant refused to take and pay for them (*hear, hear*). He thought it would be useful that it should go forth from this club as a principle, that if the tenant put up bullock-houses, piggeries, &c., with a view to making the greatest profit of the farm, and the in-coming tenant did not see the use of them, he should be allowed to take them away. Another which he proposed to insert was what he should call the general arbitration-clause; that was to say, that in case of any dispute arising between the landlord and tenant, that it should become a matter for arbitration, and not a matter of legal inquiry; and he thought that they would find that most of their best landlords would readily agree to the insertion of such a clause in their leases (*hear*). He could not, for a moment, think that any landlord would wish to go to law with his tenant, unless he wished to worry, tease, and perplex him; and on the other hand, he could not suppose that the tenant would desire it, unless he wished to worry, tease, and perplex his landlord (*hear, hear*). Of course this told both ways; and he thought arbitration was much better than going to law (*hear*). He had also drawn out a form, which he called a “cropping form;” and which, although it might not be such as to meet the necessities of all cases, it had been acted upon without any inconvenience being found to arise from it. It had been agreed to in several instances, both by landlords and tenants; it was, in fact, a species of covenant which had been in practice in some parts of the country for some time. He (Mr. Beadell) usually inserted a general clause, binding the tenant to farm according to the most approved system adopted in that part of the country in which the lands were situated. Then the land was divided into certain portions, it

might be four, five, or six; he had taken one-fourth of fallow with or without green crops, one-eighth in clover mown only once, one-eighth in beans and peas, another in non-exhausting crops, and three-eighths in wheat crops. They must all know that there was much land that was better adapted to the growth of barley than of wheat, and he therefore thought that it ought to be left to the discretion of the tenant, whether he chose to have wheat, barley, or oats (*hear, hear*); and he could not, for his own part, see that more mischief was likely to be done to land by one crop of white straw than by another. They must bear in mind that, although there they were all good farmers and excellent fellows ("*hear*" and a *laugh*), there were such persons as bad tenants (*hear*). No lease in the world would ever bind a bad tenant; and a lease became a one-sided document where a tenant could not farm well (*hear*). He begged also to say one or two words respecting persons who farmed without capital; they were the greatest enemies the good farmer had. They increased the rent which the legitimate farmer had to pay; and, supposing they had to go abroad to purchase corn, they just gave the foreigner a premium to the extent in which they were themselves deficient in growth (*hear, hear*). He thought, therefore, that the bad farmer was a great injury to the legitimate farmer, and wherever there were bad farmers, he hoped there would be those that would give them the hint: let it be remembered that where they had less twitch, they could grow a greater quantity of corn. With regard to improvements, there was certainly a difficulty on that point; he could hardly see how the subject of improvements could be dealt with in leases (*hear, hear*). His notion of permanent improvements was, that they should be carried out by the landlord, and not by the tenant (*hear*). In taking land which required draining, and would involve an outlay of £3 10s. or £4 per acre, it was necessary to consider how many acres could be managed with the capital. He was talking the other day to a large landed proprietor, who told him that he was perfectly satisfied in buying land, provided he could make 3½ per cent. of his money. He (Mr. Beadell) said—"I don't think you ought to be satisfied with 3½ per cent.; I think you ought to make more—I think you ought to make 6 per cent. It is much better to buy less land, improve it permanently, and make 6 per cent. of your money, than have a large quantity of land, and only make 3½ per cent." (*hear*). If a man took the worst of land, wood-bound land; or land with water on it, and drained and improved it, what was the consequence? Why, the tenant, who would not look at it before, was glad to take it then; and thus land which had been a byword and a reproach, was often brought into the best possible cultivation. He was not aware that there were any other remarks which he need make—he had already detained them longer than he intended when he first got up (*hear, hear*).

Mr. WOOD suggested that Mr. Beadell should touch upon the question of money and corn-rents (*hear*).

Mr. BEADELL said, he thought that was a question which hardly came within the scope of their discussion; but if it did, he would rather hear the remarks of some

other gentleman upon it. He would only say, in conclusion, that it appeared to him, that nothing could be more prejudicial than that any system should be pursued which did not fairly recognise the rights of both landlord and tenant; and in all questions of leases, they must look as well to the interests of the landlord as the tenant (*hear, hear*). It would be a great improvement upon the present state of things, when once there should be a better understanding between the landlord and tenant, as to the way in which they were to go on. A bad landlord and bad covenants were sure to make a bad tenant (*hear*). One might arrive at a pretty fair criterion as to the character of the landlord, by simply riding through his land. For if we only looked to one side of things—if we selfishly looked only to our own welfare, our selfishness was sure to punish itself (*hear*). We should always have a degraded tenantry where we had a domineering landlord (*hear*). Society formed a chain, and not one single link could be out of order without more or less disorganizing the whole (*hear, hear*); and while, on the one hand, they were ready to assert, maintain, and stick out for their own rights; they should show themselves willing to accord to others the rights which legitimately belonged to them (*cheers*). If, in the observations which he had made, it would be found that he had been instrumental in bringing forward a subject of confessedly great importance, he should feel that he had accomplished the object which he had in view in lending his humble aid (*cheers*). He could not sit down without expressing his regret that the importance of the subject had not been the means of assembling a larger number of the members of the club (*hear*). By calling attention to the subject, however, they would have sowed the seed, and he trusted they should reap a glorious harvest (*hear, hear*).

Mr. TRINDER, of Cirencester, said he had a form of lease which had been prepared at a meeting held at Evesham, and a copy of which had been sent to him. He begged to hand it to their worthy chairman, who would perhaps read it to the club.

The CHAIRMAN read the form accordingly, but it was a somewhat lengthy document, and did not appear to meet the approbation of the gentlemen present.

Mr. EDWARD AITCHESON pointed out that it made no provision with respect to improvements made by the erection of farm buildings; but only contemplated the improvements made in the land.

The CHAIRMAN said he had drawn up a form of lease for the purpose of submitting to the meeting on this occasion, and as the object was to arrive at a form of lease securing to the tenant his rights and interests, and at the same time to prevent any deterioration of the property of the landlord, he thought it necessary that the lease should go principally to those two points. He had endeavoured to show, at the meeting of the club at which the subject of tenant-right was discussed, that there was great injury done to the property of the landlord by tenants endeavouring to get their improvements out of their farms before they left them, in consequence of their knowing that they should not be paid for them (*Hear, hear*). It must be evident that the improvements of one tenant were the stepping-stone to those of another;

and surely it must be better for the incoming tenant to take and pay for these improvements than to allow the soil to be exhausted by the efforts of the outgoing tenant to get back his capital (*Hear, hear*). In Essex a tenant takes a farm for fourteen years: at the end of seven years it will be in excellent order for producing, but at that very period he begins to hesitate whether he shall go on, or whether it would not be wiser then to begin and take out the improvements; for if he allows them to remain to the end of the term, they will induce others to offer a greater amount of rent for the farm than he can afford to give; and he therefore, in nine cases out of ten, sets about to reduce the farm to the same state as that in which he found it (*Hear, hear*). Now, it must be perfectly manifest to every one that both the landlord and the tenant would be greatly benefited if they could be allowed to remain in the land, and if a fair compensation were paid for them, the rate of compensation being governed by the price of grain. The price of the quarter of corn would show what the landlord or incoming tenant could afford to pay. But if there was a fixed money rent, and the price of corn was exceedingly high or exceedingly low, much injury might be suffered. In the form of lease which he had prepared he had had a special eye to preventing this (*cries of "Read it!"*). The Chairman said he would, with great pleasure, read the form which he had drawn up; and having done so, he said he had had it printed, for greater convenience; and if the members of the club would each take a copy of it, read it carefully over, make any observations in the margin, or suggest any improvements, and transmit it to him again, he should be much obliged (*Hear, hear*). For, being a member of the sub-committee which had already been appointed, he should have an opportunity of making use of their suggestions.

FORM OF LEASE.

THIS INDENTURE, made the _____ day of _____, one thousand eight hundred and forty-six, in pursuance of an Act to facilitate the granting of certain Leases, between A. B., of _____ of the one part, and C. D., of _____ of the other part,

WITNESSETH, That in consideration of the rents, covenants, and agreements hereinafter to be observed and maintained, he the said A. B. doth by these presents, demise, lease, and to farm, let unto the said C. D., his heirs, executors, or administrators, all that capital messuage, farm, and premises called or known by the name of _____, in the county of _____, and now or late in the tenure or occupation of _____, consisting of a messuage or tenement, with yards, gardens, orchards, barns, stables, and outbuildings, together with _____ acres of arable and grass land, lying in the several inclosures numbered in the schedule hereunto annexed as follows:—

or otherwise, with their appurtenances, except out of this demise, all timber and other trees, fruit-trees, saplings, pollards, wood and underwood whatsoever, now being or which shall hereafter grow upon

the hereby demised premises, and reserving unto the said A. B., his heirs and assigns, and any person or persons authorised or employed by him, right of entry at all reasonable times upon the said premises, to mark, fell, and carry the said timber wood and underwood. And also to hunt, shoot, fish, fowl, and sport upon and over the said hereby demised premises, and to take and kill game thereon. To have and to hold* the said demised premises (except as aforesaid) unto the said C. D., his executors and administrators, for the term of 21 years to be computed from _____, determinable at the expiration of the 11th or 16th years of the said term, by either party to this demise giving notice in writing to that effect at least 18 months previously to the determination of either of the aforesaid terms. Yielding and paying yearly and every year in lieu of rent† the value of _____ quarters of wheat, such value to be deduced from the averages of the last six weeks, taken for the tithe commutation purposes, as made up and published in the *London Gazette*, at the expiration of the six weeks previously to the quarterly days respectively as hereinafter mentioned, namely, Christmas, Lady Day, Midsummer, and Michaelmas, which averages having been so taken as aforesaid, shall, upon being calculated upon the number of quarters of wheat as hereinbefore stated, constitute, represent, and actually be the rent of each quarterly day of payment respectively, the aggregate of which shall constitute, represent, and actually become the yearly rent to be paid and payable as in manner hereinbefore expressed.‡ Provided always that if it shall happen that the said yearly rent or value of _____ quarters of wheat in lieu thereof as hereinbefore expressed and reserved, or any part thereof shall be in arrear or unpaid for the space of _____ days and shall not afterwards be paid on demand, or if the said C. D., his executors or administrators, shall become bankrupt or insolvent, or shall do or suffer any act or thing whereby the said premises hereby demised may become assignable or liable to be taken in execution, or if the said C. D., his executors or administrators, shall not perform and keep the covenants, clauses, and conditions herein mentioned and contained, then it shall and may be lawful for the said A. B.,

* The periods of determining the lease may, if thought requisite, be at the 8th, 12th, 16th, or 20th years; but the first period should not be for a less time than eight years.

† If the rent be fixed upon the presumption that wheat will realize a certain price, then it may be made to vary proportionately as a rent fixed on corn, for assuming that land which will grow $3\frac{1}{2}$ to 4 quarters of wheat per acre, and 5 quarters of barley, is worth in wheat $3\frac{1}{2}$ bushels, at 56s., 24s. 6d., and in barley at 32s., 6 bushels per acre: And the covenant might be that when the price of wheat shall not exceed 56s. per quarter upon the average by the tithe commutation returns, the rent shall be 24s. 6d. per acre; and when the price of wheat shall not exceed 52s. upon the average, the rent shall be 22s. 9d. per acre; and when the average price of wheat shall not exceed 45s. per quarter, the rent shall not exceed 20s., and so may be reduced or increased in proportion as the price of wheat shall rise or fall.

‡ All payments by labour, such as carting timber or coal, to be inserted if stipulated for in the agreement; or the rent may be equalised upon the average of two or more years; or by taking the average of the whole of the preceding year or years with the average of the last quarter, and the average of these will give the rent.

his heirs, executors, administrators, and assigns, to enter into and upon the premises hereby demised or any part thereof, and in the name of the whole wholly to eject therefrom the said C. D., his executors and administrators and all other occupiers thereof, and the said C. D. doth hereby for himself, his heirs, executors, administrators, and assigns, covenant, promise, and agree with the said A. B., his heirs and assigns, in manner following: that is to say, that he the said C. D., his executors and administrators, from time to time during this demise,

1st. Shall pay the said yearly rent, or value of quarters of wheat in lien thereof, by equal quarterly payments, on the days at the times and in manner as hereinbefore in that behalf stipulated.

2nd. Shall bear, pay, and discharge the title commutation rent charges, and all other parochial rates and charges whatsoever (land-tax, quit-rents, and landlord's income-tax excepted).

3rd. Shall maintain and leave the said hereby demised premises,* with the appurtenance and all fittings and fixtures thereof, and all the roads, fences, gates, stiles, bridges, ditches, and drains belonging thereto, in good and tenantable repair, order, and condition (damage by fire and extraordinary tempest only excepted) being allowed by the said A. B., his heirs or assigns, rough timber, bricks, tiles, slate, and lime, and shall paint or tar the said hereby demised premises once in every three years upon being allowed paint or tar for the same by A. B., his heirs or assigns.

4th. Shall not cut down, or otherwise destroy or injure any of the timber or ornamental trees or saplings, nor grub up any of the underwood now growing or to be hereinafter grown upon the said demised premises, but that he the said C. D., his executors or administrators, shall be entitled to the wood and bushes arising from the fences, as also the lops of the pollards when such fences are made. †

5th. Shall preserve and protect the game and fish upon the hereby demised premises for the use of the said A. B., his heirs and assigns, friends, or servants, and suffer notices to be given and proceedings taken in his name against any person or persons trespassing in pursuit thereof.

6th. Shall reside upon the said premises during the continuance of the term hereby granted.

7th. Shall not assign or underlet all or any part of the said message and premises hereby demised during all or any part of the term hereby granted without the consent in writing of the said A. B., his heirs or assigns.

8th. Shall inbarn or stack upon the said demised

farm and premises all the crops of corn, seeds, and hay that shall yearly grow or arise thereon.

9th. Shall expend and consume upon the hereby demised farm and premises all the hay, straw, fodder, and chaff, as well as turnips and other roots and vegetables growing thereon (potatoes excepted).

10th. Shall expend upon the said demised farm and premises all the dung, compost, and manure, which shall arise or yearly be made or brought thereon, except that made in the last year of this demise, which shall be left for the succeeding tenant upon being paid by valuation for the same, together with the labour thereon.

11th. Shall manage and cultivate the grass lands in a good and husband-like manner, according to the most approved system of the district in which the said hereby demised premises is situated, and shall not break up or otherwise convert into tillage any of such grass lands, nor shall mow more than one moiety of the same more than once in any year, under a penalty of 10*l.* for every acre so broken up or converted into tillage as aforesaid, such penalty to be paid and recoverable as increased rent during the continuance of the term hereby granted.*

12th. Shall manage and cultivate the arable land in good and husband-like manner, according to the most approved system of the district in which the said hereby demised premises is situated, nor shall nor will at any time or times during the term hereby granted take from off or have upon any part thereof more than two crops of wheat, barley, or oats, without the intervention of a summer's fallow, being at liberty to take one crop of clover, beans, or peas, or some other ameliorating crops, between the said two crops of wheat, barley, or oats, and to be at liberty to grow upon the fallowed land turnips, coleseed, roots, or any green vegetable crops, provided that the same shall be eaten and consumed by cattle upon the said hereby demised lands and premises. †

13th. Shall not in the last two years preceding each of the periods at which the determination of the lease hereby granted is stipulated, or after having received notice thereof (as hereinbefore mentioned), mow any clover more than once on any of the grass lands in successive years, nor sell any hay or straw from off the farm and premises hereby demised. ‡

14th. Shall prevent as much as possible all trespasses and depredations on the said hereby demised premises,

* Where the farm is situated near towns, this covenant may be dispensed with, by allowing roots to be sold upon bringing on an equivalent in manure.

No restriction is made upon mowing clover more than once, as this crop, if converted into hay, will be beneficial to a greater extent than if fed upon the land.—If reservation is requisite to prevent mowing particular enclosures of grazing lands, insert clause to that effect.

† This covenant will admit of variation according to circumstances, and may restrict so far only as to not taking more than two grain crops between fallow and fallow, such fallow to be made in every 4th, 5th, or 6th year.

‡ If the nature of the farm will admit of hay or straw being sold, one ton of lime or good rotten manure to be brought on for every ton of hay or straw sold, and shall not during the demise sell or carry away any gravel, clay, soil, &c.

* As to improvements—if the landlord finds tiles, &c., for drainage, the tenant to pay 5 per cent. upon cost of same, or for additional buildings in the same proportion. The landlord shall restore the buildings in case they shall be destroyed by fire or tempest within six months.

† Upon this clause great diversity of opinion exists, and this covenant must therefore depend upon the mutual understanding of the parties to the lease. But I may be allowed to suggest that if the landlord conceded to the tenant the right to take hares and rabbits, reserving the winged game to himself, much damage to crops and ill will between parties might be prevented.

or in or upon the woods and plantations adjoining the same, and shall maintain and keep the roads leading to or from the same, also shall yearly do all necessary repairs to the said hereby demised premises, within the space of thirty days after having received notice thereof in writing.

15th. Shall at the expiration or other sooner determination of the term hereby granted, or from any or whatever cause the same shall or may arise, leave for the use and benefit of the said A. B., his heirs or assigns, or for the use and benefit of the then succeeding tenant, one fourth part of the arable land hereby demised, fallowed with at least five ploughings to be given at seasonable times, the first of which shall be given on or before the first day of March, and also shall and will at such expiration as of the term aforesaid, leave at least one eighth part of the said arable lands in clover or grass layer, and which said clover or grass layer shall have been sown upon lands fallowed the preceding year, one moiety of the said clover and grass layer not having been mowed.

16th. Shall permit the said A. B., his heirs or assigns, or any incoming tenant, to enter upon and take possession of all or any portion of the lands so to be fallowed as aforesaid on the 24th day of June, and also to enter in and upon the farm at spring seed time for the purpose of sowing clover or grass seeds upon the lands fallowed in the preceding year as aforesaid, and which clover and grass seeds shall be harrowed in by the said C. D., his administrators and assigns, without payment or charge for the same.

17th. Shall make the fallows and carry out the manure as stipulated as aforesaid, and leave at the expiration or other sooner determination of the term hereby granted, all the grass and clover hay made and grown upon the said demised premises within the last year, and also all the dung, compost, and manure, made or brought upon the said demised farm and premises in the last year of the term hereby granted, and all the straw and chaff arising from such last year's crop as aforesaid, together with all fixtures and buildings* erected or put up at the sole cost of the said C. D., his executors or administrators, upon the said demised premises, and all tillages and labour to the fallows and manure, and for all hay, dung, compost, straw, chaff, fixtures, and buildings to be paid for by valuation in proportion to the value and utility of the same in accordance with the preceding covenants, and all improvements consisting of draining and manuring by any manure not produced upon the said demised premises, together with all other permanent improvements, from which the full benefit may not have been derived in proportion to the original cost thereof, as the same may at that time be unexpended, such valuations as aforesaid to be made and settled by two different persons, who, when so appointed and having so taken upon themselves such reference and arbitration, shall, in writing, thereupon appoint an umpire, whose decision, in case of any disagreement between such arbitrators, shall

be final, binding, and conclusive, and to whom also shall be referred all other matters in dispute in respect of such occupation, and all dilapidations of and upon the said demised land and premises, and all damage sustained by the land and fences from unskilful and improper management or otherwise, and who shall be empowered to deduct the amount awarded for the same from the amount of the valuation so to be ascertained as aforesaid.

18th. Shall have the use of the barns, stack yards, and premises to thrash and dress the crops of corn and seeds arising from such last year's crop, according to the custom of the county as aforesaid, and shall be paid or allowed for the thrashing out of such last year's crop, and have the corn arising therefrom carted out by the said A. B., his heirs or assigns, or by his succeeding tenant, a distance not exceeding 10 miles as compensation for the straw and chaff arising therefrom.

And it is hereby agreed and declared that he the said C. D., his executors or administrators, paying the rents, and observing, performing, and keeping the covenants hereinbefore contained, shall hold and occupy the farm and premises herein demised for all the said term hereby granted, without interruption by the said A. B., his heirs and assigns.—In witness, &c.

Another Clause for a Lease fixed upon a Corn Rent deduced from the prices of various kinds of Corn.

Yielding and paying therefore, yearly and every year during the said term unto the said A. B., his executors or administrators, the rent in the manner and at the times hereinafter mentioned; that is to say, 50 qrs. of wheat, 50 qrs. of barley, and 30 qrs. of beans, to be ascertained quarterly by the average price of wheat, barley, and beans, sold at the corn market in London, in the entire week next preceding the 25th day of December, the 25th day of March, the 24th day of June, and the 29th day of September in every year, and one fourth part of the value of 50 quarters of wheat, 50 quarters of barley, and 30 quarters of beans, to be paid on each and every of the said quarter days during the said term, without making any deductions, defalcation, or abatement whatsoever out of the same, or any part thereof.

To produce a fair equable annual payment, corn-rents may also be based upon the average of the preceding two or more years. Suppose it should be required to fix it upon the average of three years, and that during the first year the average price of corn had, from the *Gazette* returns, have been 52s. per quarter, and on the second year 48s. per quarter, and the average price of the last quarter 56s., the average to be deduced would be as follows:—

When for Three Years.

1st Year	52 × 4 = 208
2nd Year	48 × 4 = 192
3rd Year	} 56 = 56
Last Qr.	
	9)456

50s. 8d. average of Three Years.

* Buildings that have been put up by the tenant without the consent of the landlord, to be removed, or to be taken at the value of the materials only, at the option of the landlord.

When for Two Years.

1st Year	}	48	×	4	=	192
2nd Year		}	56	=	56	5)248
Last Year						
49s. 7½d. average of Two Years.						

It would be found that he had made several notes at the foot of the form of lease, respecting buildings put up by the tenant without the consent of the landlord, and that his proposition was, that either they should be removed by the outgoing tenant, or taken at the value of the materials only. There were other clauses, about hay and straw: for instance, he had made no restriction regarding clover; but he had laid it down with respect to straw, that for every so many tons of straw carried away, so many tons of manure should be laid down. He had mentioned tons instead of loads, because the word "load" was indefinite and ambiguous; what was a load in one place was not a load in another (*Hear, hear*). There had been an objection raised with regard to a corn rent, on account of the difficulty of fixing it equitably. But all difficulty might be obviated by taking an average of three years: this would always form a fair basis of rent. In reply to a question, he here stated that he proposed, in reference to manuring, that one ton of lime should be laid down for every ton of straw sold. There was another covenant relating to a corn rent, according to which the rent would be represented by a certain amount of produce in corn. He had also laid down the principle that the tenant should not exhaust the land, but receive compensation for improvements effected; and if, on the other hand, the tenant caused any deterioration in the value of the landlord's property, then a deduction should be made upon a valuation; the object being to protect the landlord as well as to give security to the tenant (*Hear, hear*). There was one matter of considerable importance upon which he differed in opinion from Mr. Beadell and many other gentlemen, namely, that with regard to the mowing of clover a second time. All leases restricted the tenant from mowing clover more than once. Now, he (Mr. Baker) had seen as good wheat grown after mowing the clover twice as after feeding it. There was something so peculiarly advantageous to the land in the shading of clover, as to make the second mowing fully commensurate with feeding. There was not the amount of advantage derived from feeding in regard to manure that was generally supposed, for the dung deposited was nearly all evaporated by the heat of the sun (*Hear, hear*). As an evidence of the correctness of his views, he might remind them that clover was not worth more than from 30s. to 50s., or at the most 60s. an acre; and he knew a case of twenty acres having been mown twice, and both crops sold; they were sold by auction, and therefore did not fetch more than a fair price—both crops sold for £365 (*Hear, hear*). Now, he wished to ask whether, in cases where they could mow, anything in the shape of feeding could compensate for this (*Hear*). Why, the clover paid for the crop of wheat itself, whereas, if it had been fed, it

could not have produced £5 per acre (*Hear, hear*). Clover, carried into the yard, would maintain a vast quantity more stock than it could possibly maintain by feeding, and therefore it was that he thought the tenant should not be prevented from mowing twice, if he thought proper (*Hear, hear*). He quite agreed in the principle laid down by the gentleman (Mr. Beadell) who had opened the question, that no man ought to take a farm which required capital beyond his means; but tenants were too apt to look out for large farms. He was quite satisfied that great good was to be done by framing leases with an impartial eye: a lease must not be a one-sided thing: it must not be made entirely for the purposes of the landlord, or exclusively with a view to the interests of the tenant, but for the mutual advantage of each (*Hear, hear*); and if they could only show the landlords that a better form of lease would be better for them, as well as for the tenant, he could not suppose them to be such egregious asses as not to adopt it (*Hear, hear, and a laugh*). Only show the landlord that his estate would be benefited by it, that his family would be benefited by it, and not only his, but his tenants' also, and he would be ready enough to accede to it, and to accept the tenant on such terms (*Hear, hear*).

Mr. HUTLEY said, he did not agree with the principle laid down by Mr. Beadell, of tying the farmer down to bring back upon the farm, in manure, the value of the straw taken from it.

Mr. BEADELL: I did not say that: the value of the dung which the straw would make, was what I meant, and, I believe, what I said (*hear, hear*).

Mr. HUTLEY said: in the next place, with reference to Mr. Baker's form of lease, he could not agree to the principle of giving up all rights to game in favour of the landlord, which he regarded as giving the independent tenants' right away (*hear, hear*). He thought they ought to recommend that which was useful and beneficial. The tenant ought to preserve and take care of the game for the landlord, but he was as much entitled to kill it as the landlord himself.

The CHAIRMAN said there was a covenant in his form of lease securing the tenants' rights in this respect.

Mr. HUTLEY said he did not understand it so.

Mr. TRINDER said the form of lease which he had handed in was silent altogether about game.

Mr. HUTLEY said it was a very serious thing to be bound to keep game for other people. Anything which went forth from this club ought to be for the benefit of the agricultural body at large; and he held that the man who maintained the game ought to be allowed to shoot it (*hear, hear*).

The CHAIRMAN said he believed it had been held in all cases that, unless the lease reserved to the landlord the entire right to the game, and precluded the tenant altogether from sporting, he (the tenant) was not precluded (*hear*). They could not suppose that a gentleman who was fond of game would give up his right in this respect: a gentleman often invested his money in an estate for the sole pleasure of shooting; and if he (Mr. Baker) had an estate which he was about to let, he would certainly reserve this right. He would not pre-

clude the tenant from shooting, but he would reserve the right for himself also (*hear, hear*).

Mr. THOMAS next rose and said: gentlemen might, perhaps, think him, as rather a new member of this club, almost intruding, but no one had listened more attentively than he had to the remarks which Mr. Beadell had made in opening this question, and he would, with the permission of the meeting, offer a few observations on the subject before them (*hear, hear*). In the greater portion of that gentleman's remarks he perfectly agreed, and, with respect to leases, thought it quite true that it was possible to put upon one single skin all that was necessary (*hear, hear*.) In fact he happened to hold a lease of that description, for the principle had been acted upon in his part of the country (Bedfordshire). He conceived that there was no one in that room but would admit that a lease was indispensably necessary to the tenant; but before drawing up a lease it was very necessary to consider what the demands of manure would be. For he apprehended that the rent of farms which were near enough to towns readily to obtain a large supply of manure, should differ from those which had not this advantage. Another important point was, the character of the person to whom the landowner was about to consign his land; and before he let it, it was his bounden duty to inquire into this; and he (Mr. Thomas) thought that no tenant ought to regard it as any slur upon him if the landlord inquired into his means before he let him the farm (*hear, hear*). Then, as to the point that no one ought to take more land than he had capital to farm well; in that he quite coincided, especially at a time when there was so much political tergiversation, and one could hardly believe in the professions of statesmen, or trust them to the length of one's arm on the extent of a tether (*Hear*). A new plan had recently been adopted of letting farms on a 16 or 20 years' lease; and the rent of the first four years was assessed at a certain number of quarters of wheat or barley, according to the price of the period. At the expiration of the first four years, the price of corn was taken from the averages published in the *Gazette*, and the rent again fixed; and so on at the end of each four years until the term of the lease had expired (*Hear, hear*). This plan had not been adopted without very long and very mature consideration; and he must say upon reflection, that he did not think a system more honest and more satisfactory could be found (*Hear*). Now with regard to the period for which a lease ought to be granted, he thought it must be clear to every one, that a term less than 16 or 20 years was scarcely sufficient to allow the tenant to reap the reward which he ought to receive for his exertions (*hear*). He ought to have that fixity of tenure which would inspire every farmer with hope, and give him a pleasure, in cultivating his farm, which he could not have if he thought it would pass out of his hands (*Hear, hear*). In leases of farms upon which there was land which wanted draining, the landlord might, in default of the tenant doing it, enter upon the farm, drain the land, and charge him 6 per cent. for the outlay; and he did not think that the tenant could complain of the outlay which his own neglect had caused his landlord to make for him. With regard to the sale of straw and hay

on the farm, the practice with him was to bring back a certain quantity of dung in lieu of it. On the subject of mowing clover twice, he begged to say that in the case of red clover, he had found it more profitable to mow it than to feed it down with sheep; indeed, he never in one instance found that the crops of wheat had not been finer and larger than when fed down by sheep (*Hear, hear*). Respecting the question of game, he must say that he felt strongly: to introduce an enormous quantity of game on a farm was, in some instances, almost equal to doubling the rent; and when a landlord chose to keep a large stock of game, the efforts of the farmer must become almost paralyzed. He trusted that he should never hold up his hand for a lease in which the landlord kept a quantity of game, and claimed the right of killing it all himself (*Hear, hear, and cheers*). A plan had recently been hit upon in his neighbourhood, which was found to work very well: it was an arrangement to the effect that the landlord should shoot all the feathered game, and the tenant all the quadrupeds; and this appeared to give satisfaction to both parties (*Hear*). He thought this was sound in principle, and calculated to keep up good feeling between landlord and tenant (*Hear, and cheers*).

Mr. WOOD said that after the able remarks which they had just had addressed to them, he felt some diffidence in offering any observations. He did not, however, see the necessity in any new form of lease for tying the farmer down to any particular system of cultivation, although it might be very well to prescribe what particular crops should be taken so as to prevent deterioration by over-cropping (*hear*). He quite agreed with Mr. Beadell's observations with regard to drawing short leases so as to do away with the lawyers (*hear, and laughter*).

Mr. BEADELL: I did not say I wished to do away with the lawyers (*renewed laughter*). I said, let the lawyers attend to the legal part of the lease. I know nothing about law myself, and think it would be quite impossible that a lease could be well drawn without a lawyer. But what I was anxious to enforce was, that a lease could be as well drawn on one skin as on five or six (*hear*).

Mr. WOOD: Well then, I will give it as my own opinion, that it would be well to do away with the lawyers in drawing leases (*hear, and laughter*). I think it much more the business of a land-agent than a lawyer; and the fact of there being an act of parliament to allow land-agents to do so without incurring penalties, shows that the legislature is of the same opinion as I am (*hear, hear*). With regard to a corn rent—I think there are many means of preventing loss by increase or decrease in the value of money. We all know that many persons have been ruined by the fluctuations in the value of money, and not by their own want of providence or skill. I think it might be defined in this way—I won't state this as my own notion: it was mentioned to me by a friend of mine, as a plan for paying a fixed money rent half-yearly, of a certain sum, say £250—At the end of five years, take the average *Gazette* prices of so many bushels of wheat, beans, oats, or barley, according to

the nature of the land; then strike a balance between the amount paid in pounds sterling, and the amount according to the value of the corn, the landlord or tenant paying the difference as the case may be (*hear*). I think this would be a very good way of obviating any difficulty with respect to manures, draining, and general improvements of the farm; these may easily become at; and the value might be arrived at with greater accuracy, if the tenant, in carrying out his manures, sent in from time to time an account of the same, so as to enable the landlord to ascertain the quantity and quality; for there is a vast difference in manures, and in some places it is little better than wet straw.

Mr. BEADELL: Not in Essex—that is not the case in Essex (*hear, and a laugh*).

Mr. WOOD: It is, under present circumstances, very difficult for the land-valuer to ascertain the worth of the manure; but if an account were sent in by the tenant, as I propose, there would be a much better opportunity of ascertaining it. Therefore, I suggest that an account of the dung should be sent in every six months, as also of the value of the draining, in respect of which compensation would be claimed. I perfectly coincide in all that has been said about game and farm buildings. I have merely thrown out the suggestion for sending in accounts in order to prevent things from being overvalued to the incoming tenant, as they too often are, from the fact of the valuer not having sufficient means of judging (*hear, hear*).

The CHAIRMAN: The valuer generally examines the workmen on the farm upon these matters, and does not content himself with the statement of the out-going tenant merely.

Mr. BEADELL said, he thought the suggestion of Mr. Wood, respecting a corn rent, deserving attention, on account of its fairness; but at the same time he regarded it as impracticable. A settlement after allowing matters to run on for four years would be very inconvenient. With respect to his proposition for having accounts sent in every six months, it reminded him very much of a covenant which he had found in a lease, binding down the tenant to keep a regular "field book"—a book to show the cultivation of every separate portion of the farm. But when the farmer was asked for his field-book, his reply was, "Oh, I never kept one" (*hear, and a laugh*); and he thought it very probable that, if Mr. Wood's suggestion were acted on, when the book was required, the same answer would be returned.

Mr. WOOD said he conceived that his plan, if tried, would not be found quite so Utopian as Mr. Beadell appeared to think.

Mr. BEADELL said he did not think it Utopian; he thought it impracticable.

Mr. WOOD thought the tenant would readily enough find means of sending in such accounts; and by those accounts, and the adoption of the principle of a corn rent, he would be able to protect himself.

The CHAIRMAN thought that an adjustment of accounts might take place every year; a certain sum might be paid at the time, and an adjustment made afterwards.

Mr. EDWARD AITCHESON was of opinion that that would lead to quarrels and squabbles—the very thing which they wished to avoid. Nothing was more objectionable than the landlord and tenants having to come together too often; it was sure to engender ill-feeling, and in the end to lead to a sort of hatred between them (*hear, hear*). He would make a few observations, now that he was up, on the question immediately before them. He had had occasion to see a great many leases in his time, and he never found any good to arise from a lengthened lease (*hear, hear*). His own opinion was, that any man who could read and write was capable of drawing as good a lease upon a sheet of foolscap as upon twenty skins. For his own part he thought he could as well draw up a sound and clear lease for a farm of a thousand acres upon a sheet of foolscap, as he could upon any number of skins of parchment (*hear*). It had been suggested by their excellent chairman that the incoming tenant should be allowed to come upon the farm, and sow seeds and green crops, before the outgoing tenant had quitted it. Now he (Mr. Aitcheson) saw many reasons for objecting to the interference of the two tenants upon one farm at the same time (*hear*). He should much rather pay the outgoing tenant upon a valuation for doing this. The man who held the farm ought to have an uninterrupted right to everything until he went out (*hear, hear*). He was not prepared at that moment to show them one of his short leases; but at the meeting of the committee he should be very happy to produce a lease written upon a sheet of foolscap paper, which he thought would contain all that was necessary in any lease whatever (*hear, and cheers*).

The CHAIRMAN said that allowing the incoming tenant this privilege would often prevent a great deal of disagreement, which he had seen between the incoming and outgoing tenants, at the close of the term of a lease. The outgoing tenant had the power of sowing turnips or coleseed, judiciously or not, as he chose; and he had known instances in which the outgoing tenant had, from some pique against the incoming tenant, sown the seeds upon the very lands on which they ought not to have been sown; and when remonstrated with, had replied, that he could sow them where he liked, or that he had done so to the best of his judgment (*hear*). To prevent mischief of this kind, he would allow the incoming tenant to sow the seeds himself; or at all events it might be arranged that the incoming tenant should have the option of selecting the ground upon which they should be sowed (*hear*). With regard to the arrangement for a corn-rent, he (Mr. Baker) could not help thinking Mr. Wood's plan very objectionable, as going over a period of four years; the difference then to be adjusted might amount to a year's rent. He thought it was much better that an adjustment should take place at the end of one year than at the end of four years. If the averages were taken at the end of each year, the matter could be settled and done with (*hear*). They might always take an average of three years in coming to this arrangement, because in doing so all that would be necessary was, to strike off the first, and add the last (*hear, hear*). The only objection to a corn-rent was the trouble it gave; but

the course which he had pointed out was a plain and easy method for arriving at a fair conclusion (*hear*).

Mr. EDWARD AITCHESON remarked that if upon Mr. Wood's plan there should, at the end of four or five years, be a serious balance against the tenant, he might not find it very convenient to pay it (*hear*).

Mr. WOOD: But he would have had the advantage of it in the meantime.

Mr. EDWARD AITCHESON: Yes; but if he had been a prudent farmer, he would have expended the money on the farm (*hear, hear*).

Mr. FISHER HOBBS said he was sorry to see that a subject of so much importance to the tenant farmer as that which had been fixed for discussion this evening, had not mustered a more numerous attendance of the members of this club (*hear*); and whilst there were many things of which he highly approved in the proceedings of the night, he did not think that they had gone far enough for the encouragement and improvement of agriculture in the present day. He did think that while every protection ought, doubtlessly, to be given to the landlord, every possible encouragement ought to be given to the skilful and enterprising tenant also (*cheers*). He did hold that the leases brought forward were such as were applicable to years past, and not such as ought to be recommended for a long term of years, to commence at the present time; as agricultural knowledge progressed, such encouragement ought to be given as should enable the tenant farmer to go on at the same rate (*hear, hear*). There was a great difference between the old, sluggish, indolent tenant, who would not help himself, and the skilful man and man of property, who wished to make the land produce as much as nature would allow it (*hear, hear*); and he thought, in recommending any particular form of lease as emanating from this club, they ought not to lay down any particular restrictions as to cropping, but only to lay down such rules as would prevent the deterioration of the property (*hear*). He (Mr. Hobbs) was one of those who thought the old four-course system was very fast wearing out. He thought that they ought never, under any consideration whatever, to have two white straw crops together. But there were so many new roots and new crops annually brought forward, that the farmer ought not to be tied down to any particular system of white straw or pulse crops, to which these forms of lease did tie him down; they also compelled him to consume the roots upon the farm. He thought they could not well farm too high; and that it was most advantageous to sell off the root crops. They were often taunted about Scotch farming. Why, in Scotland, the root crops were the most profitable things they had. The tenant ought to have every facility which it was possible to give him in his operations, short of exhausting the land (*hear, hear*). With regard to permanent improvements, such as drainage, they ought to be performed by scientific men, or by a company of men, and not by the tenant (*hear*). He thought it would be advantageous to both parties if the landlord were to do the drainage, and the tenant were to pay him a certain rate of interest for the outlay. He could not, however, agree with Mr. Thomas, that

the landlord ought to ask 6 per cent.; 5 per cent. was ample and abundant, and he did not think this club would be justified in recommending more than 5 per cent. (*hear, hear*). With regard to buildings, he did not think the tenant could afford to pay rent for his land unless the landlord erected good farm-buildings, or encouraged him to erect them himself (*hear*). With respect to game, he was one of those who thought that a vast deal of injury was done to the tenantry of the country by game; much more, indeed, than the public were generally aware of (*hear, hear*). In Norfolk, last year, he heard of instances of the game injuring the tenant nearly to the amount of the rent of the land. He was not one of those who would say that the landlord should not have the right to come upon his own land, but there should be some limit to the extent of preserving game. With regard to compensation being allowed to the tenant for his unexhausted improvements at the expiration of the term of his lease, very little had been said; he supposed that was attributable to the fact of the question of tenant-right having so recently come before the Club (*hear*). He hoped that that would be a point which would be strongly recommended in any new form of lease; for he contended that the skilful and persevering tenant ought, if he left unexhausted improvements upon the farm, to be remunerated for them (*loud cheers*). A proper form of lease would be a most advantageous thing; he was perfectly satisfied that throughout his own county, and probably throughout England, a good form of lease would be the means of increasing the cultivation to the extent of 10 per cent. (*hear, hear*.) He hoped and trusted that a form of lease would be adopted by this Club; for if one were adopted he felt certain that the gentlemen of the legal profession would be very glad to follow it out (*hear*). He had talked upon the subject to legal gentlemen in the metropolis, who had told him that they should be glad to adopt such a form of lease for their clients if they knew that it was framed upon a sound principle (*hear, hear*).

Mr. TRINDER impressed upon the Club that it would be highly desirable that each member should take a copy of Mr. Baker's form of lease, and write his observations or suggested improvements upon it, which might be discussed at a meeting to be called at some future day (*hear*). If Mr. Baker would favour him with a copy of it, he promised that he would do so.

The CHAIRMAN repeated that he had had it printed for that purpose, and there were copies on the table for all who chose to take them.

Mr. COBB said he thought that it was utterly impossible to frame any form of lease which would apply to all parts of the country. He was himself a Kentish farmer, and in Kent two white-straw crops were not objected to. They there used a great many fish as manure, and fallowed only once in seven years. He was aware that the gentleman who had opened the question (Mr. Beadell) would not give them any great credit for the management of stock, but he was quite sure he would say nothing against their farming (*"Hear, hear," and a laugh*). In Kent they went upon this principle—What

ought to restrict a good farmer? Nothing (*cheers*). To restrict a good farmer in his operations was the worst thing they could do (*hear, hear*). In the case of a farm belonging to Sir Edward Knatchbull (a name well-known to them all), the tenant went to him, and said he had been doing a great deal to improve the land, and he thought that he ought to have a lease. The result was that Sir Edward gave him a lease; he did not know the precise conditions of it, but it was a continuing lease from seven years to seven years. When Michaelmas arrived, at the end of seven years, if the landlord and tenant still agreed, it went on for seven years more, and so on (*hear*). With regard to the rate of interest to be charged by the landlord on improvements, he agreed with Mr. Hobbs, that 5 per cent. was quite sufficient (*hear*).

Mr. THOMAS said that in mentioning 6 per cent. he had merely stated the fact as to what was paid in a particular instance, without meaning to lay it down that 6 per cent. ought to be the rate of interest generally charged for outlays upon drainage (*hear, hear*).

The CHAIRMAN, in conformity with their usual practice, now submitted a resolution for the adoption of the meeting. He said it was very easy to frame a lease for Kent, Sussex, Devonshire, Herefordshire, or any particular county; but what they must do was to frame such a lease as would apply to farms generally (*hear*). He would read a resolution which he had sketched. This he did; and after some discussion and alteration it was at length brought to the following terms:—"That leases should be so framed as to give the tenant the fullest scope for the management of his farm and security for the capital invested in improvements, and at the same time to give to the landlord protection from undue cultivation or injury to the farm. And this meeting is impressed with the conviction that draining should be done

by the landlord, who should charge a moderate per centage upon the outlay; and also that leases are essential to the cultivation and beneficial occupation of land" (*hear, hear*).

Mr. AITCHESON thought it highly desirable that draining should be done by the landlord.

Mr. THOMAS objected to its being laid down in all cases that the landlord do the draining. He had himself had an offer from his landlord to this effect, that he (the landlord) would be at half the expense of the materials and half the cost of the labour, or he would do it all himself and charge 6 per cent. upon the outlay. He (Mr. Thomas) at once embraced the first part of the proposition, and the landlord found half the tiles and half the labour (*hear*).

Mr. HOBBS said his reason for thinking it better that draining should be done by the landlord was, that farmers generally understood very little of the principle of draining; and on that very ground he did not think it was safe for the landlord to find the tenant in tiles. It was a part of labour which the tenant knew very little about, and if they employed men whose whole time was devoted to such operations it would be found more advantageous both to the landlord and tenant (*hear*). A person who did not understand the business would put in 10*l.* worth of tiles where a skilful drainer would not use more than 2*l.* worth (*hear, hear*).

Mr. WOOD suggested that they should omit altogether that part of the resolution which related to the landlord's doing the draining, for he really believed that the landlords had not the money (*laughter*).

The resolution in the above form was, however, moved and seconded, and

The CHAIRMAN having put it to the meeting, it was carried unanimously.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A Weekly Council was held at the Society's House Hanover-square, on Wednesday, 25th of March; present, His Grace the Duke of Richmond, K.G., in the chair; Sir John V. B. Johnstone, Bart., M.P.; T. Alcock, Esq.; Thos. Raymond Barker, Esq.; John Benet, Esq., M.P.; F. Burke, Esq.; Col. Challoner; F. C. Cherry, Esq.; H. Gibbs, Esq.; Professor Sewell; H. S. Thompson, Esq.; S. Bencraft, Esq.; H. Burr, Esq.; A. E. Fuller, Esq., M.P.; G. Vernon Harcourt, Esq., M.P.; E. Hussey, Esq.; C. Miles, Esq.; O. Ogilvie, Esq.; A. L. Potter, Esq.; H. Price, Esq.; G. H. Ramsay, Esq.; and T. Turner, Esq.

Prize Essays.—Mr. PUSEY, M.P., Chairman of the Journal Committee, having reported the essay to which the judges had awarded the Society's prize for a report on the farming of Cambridgeshire, the sealed motto-paper containing the name of the author of the successful essay was opened by the Chairman in the presence of the Council, and the adjudication found to stand as follows:—

To SAMUEL JONAS, Esq., of Ickleton, near Saffron Walden, the Prize of £50, for his report on the Farming of Cambridgeshire.

Farm-Yard Manure.—Sir JOHN JOHNSTONE, Bart., M.P., agreeably with the arrangement of the Council, as proposed at their last meeting, then introduced to the notice of the members present M. Ouvrard, the French financier, at present on a visit to this country, and who had been introduced to Sir John Johnstone by a friend who was desirous that M. Ouvrard should have an opportunity of laying before the Council a plan of managing farm-yard manure, submitted to him by M. Emile Encoutre, at present residing at No. 48, in the Haymarket, London.

M. ENCOUTRE having remarked that the greater number of farmers left their manure-heaps exposed to the rain, while the smaller number covered them with earth, but imperfectly, and without entirely preserving them from injury and loss, was led to conceive that this object would be most effectually attained by covering the

whole of their surface with a layer of tar mixed with lime. This covering, he imagined, would not only be a complete protection against the rain, but would also tend to the attainment of the following objects: 1. The retention of those exhalations which have nitrogen for their chief element, and, in a manuring point of view, are of the greatest value. 2. The watering of the heap by different manuring liquids produced on the farm, or furnished from other sources, should a deficiency exist. 3. The acceleration of the fermentation and decay of the heaps by passing through them different pipes heated by means of steam to a temperature ranging from 60° to 70° F., and supplied by a boiler, of which the original price would not be more than 2*l.* or 3*l.* M. Encoutre also stated that the grain, before being sown, was immersed in a solution of gelatine and starch diluted with brine, and then sprinkled with the manure reduced to a dry and powdery state. Having given this account of his plan, he proceeded to detail the practical results which had been obtained in France by its adoption; from which it appeared:—1. That only one-sixth of manure thus prepared would be required in comparison with the quantity of common farm-yard manure usually applied for the same extent of surface. 2. That the produce of corn was found to be one-fifth greater where his manure had been used. 3. That after two years the same land was found to require only one-half of the original manurings to keep it in the same condition. 4. That the expence attending the application of this new manure was 8*s.* per acre. M. Encoutre, in conclusion, requested the Council to appoint one or more farms in different parts of the country where his experiments might be repeated, and the value of his plan brought to the test of practical trial, expressing his willingness to give his personal attendance at each of the places selected, and to instruct the parties appointed to make the trial in the proper mode of proceeding.

M. Ouyard then received of the Council their thanks to M. Encoutre, for his attention in submitting this plan to their notice; and availed himself of a suggestion that was made to him, that on the experimental farm connected with the Royal Agricultural College, at Cirencester, it might probably be at once submitted to the practical trial required by its inventor.

Gorse for Sheep.—Mr. Sandham Elly, of Elly Walks, near New Ross, in Ireland, the author of a paper on gorse as food for cattle, in the last part of the Society's Journal (p. 523), communicated to the Council the result of an experiment he had made in feeding sheep on that substance—the first instance he believed either in Ireland or England of sheep sold in market fattened on gorse. The sheep, widders of two years old, were put into a stall in the bullock-house in the last week in December, in fair average condition. They had a feed of beet in the morning, and three feeds of prepared gorse in the evening of each day, until the last week in February, when they were sold fat to the butcher, and realized 30*s.* on the lot. The beet was given as a variety of food, and occupied the time during which the gorse was undergoing preparation. The mutton proved to have an excellent flavour, of the wild

mountain kind, and its chief excellence consisted in the abundance of rich gravy it contained. Mr. Elly expressed himself so well satisfied with this result of his experiment, that it was his intention next year to go more largely into the speculation.

Miscellaneous Communications. — 1. From Mr. Thompson, giving notice that at the monthly meeting of the Council, on Wednesday next, he intended to propose some arrangements regarding the lectures to be given to the members at the ensuing country meeting at New-castle.

2. From Sir Trayton Drake, Bart., reporting that, on his farm at Nutwell Court, in Devonshire, Swedish Turnips, cut into slices by the Turnip-cutter, were employed in their raw state as an excellent food for his horses; and that, boiled in a copper and mashed into a pulp, his pigs thrived on them very well.

3. From Mr. Johnson, of Farnham, stating that land sown with White Mustard, and fed off with sheep, had become perfectly free from moles and wireworms, with which it had previously been constantly infested.

4. From Mr. Fisher Hobbs, Mr. Jonas, Captain Garland, Mr. White, Mr. R. W. Baker, Mr. Fuller, M.P., and Mr. H. Manning, undertaking to make trial of the Australian Wheat and Barley sent to the Society for that purpose, and to report the result to the Council; Mr. F. S. Dutton undertaking to furnish to the Council the result of Dr. Ure's analysis of each of those supplies.

5. From Mr. John Townley, papers on the Potato disease; and on the question, whether varieties of plants propagated by extension wear out.

6. From the Royal Agricultural Society at Prince Edward Island: a copy of their Annual Report, transmitted through His Grace the Duke of Richmond.

7. From Mr. Milberg, of Jever, Hanover: a notice of the new cultivator: invented by him.

8. From Mr. Pusey, M.P., transmitting the thanks of the honorary members elected at the previous monthly Council, for the honour of their election, and their desire to promote the objects of the Society; also Professor Graham's especial wish to promote the views and investigations of the Society in those branches of science to which he is himself more particularly attached.

9. From Mr. Raymond Barker, a notice, that at the next meeting of the Council, he should move an adjournment over the Easter Recess, from the 1st to the 22nd of April.

The Council then adjourned to Wednesday, the 1st of April.

A monthly Council was held at the Society's House, in Hanover-square, on Wednesday; present, Thos. Raymond Barker, Esq., in the chair; Sir John V. B. Johnstone, Bart., M.P.; S. Bennett, Esq.; T. W. Bramston, Esq., M.P.; W. R. Browne, Esq.; J. F. Burke, Esq.; Col. Challoner; F. C. Cherry, Esq.; J. Evelyn Denison, Esq., M.P.; H. Gibbs, Esq.; B. T. B. Gibbs, Esq.; S. Grantham, Esq.; C. Hillyard, Esq.; W. Fisher Hobbs, Esq.; W. H. Hyett, Esq.;

S. Jones, Esq. ; J. Kinder, Esq. ; F. Pym, Esq. ; J. A. Ransome, Esq. ; Prof. Sewell ; H. S. Thompson, Esq. ; G. Wilbraham, Esq. ; and G. H. Ramsay, Esq.

Finances.—The Report of the Finance Committee was read and adopted; from which it appeared that, at the end of the month just ended, the amount of stock invested in the public funds, in the names of the Trustees of the Society, stood at 7,000*l.*, and the current cash-balance in the hands of the Society's bankers, at 1,598*l.*—Colonel Challoner also laid before the Council the official return on the annual income of the Society, for which he had moved at a previous meeting.

Prize Essay.—Mr. Pusey, M.P., chairman of the Journal Committee, transmitted to the Council the motto of the Essay on the "Drainage of Running Sands," to which the judges had awarded the Society's prize of 10*l.* for the best essay in that class; and the sealed motto-paper being opened by the chairman in presence of the Council, it was ascertained that the author of the winning essay in question was Mr. William Linton, of Sheriff Hutton, near York, who was declared by the Council to be the successful competitor for that prize.

Newcastle Authorities.—The agreement between the Mayor and Corporation of Newcastle-upon-Tyne, and the Royal Agricultural Society of England, in reference to the arrangements for the ensuing country meeting of the Society to be held at that place in the middle of July next, was received from Messrs. Clarke, Fynmore, and Fladgate, the solicitors of the society; and having been read to the Council, and signed by the Chairman, the Great Seal of the Society was affixed to the document in the presence of the Council, and the Secretary authorised to complete the agreement by the addition of his signature in the name and on behalf of the Society, agreeably with the terms of the Charter.

Newcastle Lectures and Discussions.—Mr. Thompson then moved, agreeably with the notice he had given at the previous Council, for the appointment of a committee to make arrangements for lectures and discussions on agricultural subjects at the ensuing meeting at Newcastle. He stated that one of the main reasons that had induced him to make this motion was his conviction that, although the Society had been very successful in bringing together first-rate exhibitions of stock and implements, it had not yet succeeded in producing a free interchange of opinion amongst practical men, or anything approaching to adequate discussion on the disputed questions in agriculture—one of the principal arguments used to justify the laying out of so large a sum annually in premiums at the Show having been that such outlay was absolutely necessary to induce practical men to assemble from distant parts of the country, and that when so assembled they would assuredly both impart and receive benefit from intercommunication and discussion with each other. Mr. Thompson, however, need scarcely ask whether this expectation had been realised. In the Show-yard, or at the trial of implements, the little conversation that took place was, he believed, chiefly carried on accidentally, and between such parties only as were locally

known to each other, from the circumstance of their having come to attend the meeting from the same county, or even from the same neighbourhood; whereas, he conceived, the object of the Society was to induce persons living at a distance from one another to practise different systems, and to compare their respective opinions, so that those who could satisfactorily show their practice to be the best, might induce others to follow their example, while they, on the other hand, might themselves be led to abandon such parts of their own system as could not rationally be defended against the advocates of other views. The arrangements which had already been made with a view to the attainment of that object, and the methods tried by the Royal Agricultural Society of England and other associations to render them successful, had been of three kinds, namely—1. Lectures; 2. Discussions after dinner or breakfast (as practised by the Highland and Yorkshire Societies); 3. Sections: in the system followed by the British Association, where each of the great branches of science has a separate lecture-room allotted to it, in which papers approved of by a committee of selection are read, and followed by discussion. The plan first mentioned, that of giving lectures, though very useful in imparting to many the information possessed by the lecturer, was, in Mr. Thompson's opinion, utterly inefficient in the equally important object of eliciting truth by the conflict of opinion and the comparison of facts: in other words, that discussion led to the acquisition of knowledge—lectures to the diffusion of that already acquired. Attempts, he was aware, had been made to combine these advantages, by means of a discussion after the lecture; but in all cases that had come to his knowledge, that object had been defeated by the length of the lecture; the attention was fatigued by listening for an hour or even more; and with the exception of a few brief questions to the lecturer, the audience were found unwilling to recommence the subject. The second plan, that of discussions at table, though found to answer in cases where the numbers were limited to a moderate amount, would, he feared, be found impracticable on a large scale. The inconvenience of providing breakfast or dinner for a large and uncertain number of guests, and the difficulty of carrying on a discussion in a room large enough to accommodate 400 or 500 persons at table, were, he thought, sufficient objections to such an arrangement. The method followed by the British Association seemed best adapted to attain the object in view; and with some modifications, he thought the advantages of lectures might be combined with those resulting from the reading of papers and discussion. He considered that it would be one main point to have the lectures short, and to have it clearly understood that such lectures should be only the opening of the subject and commencement of the business of the meeting. These, however, he regarded as matters of detail only, which he would willingly leave to the committee; his main object was to obtain the sanction of the Council to the principle for which he contended, and the appointment of a committee for the purpose of working it out in its practical details. The following committee on this subject,

agreeably with Mr. Thompson's motion, was then appointed, with instructions to report to the Council at the next monthly meeting, on the 6th of May; namely:

Lord Portman, President
Duke of Richmond
Lord Braybrooke
Hon. R. H. Clive, M.P.
Sir Charles Lemon, Bart, M.P.
Sir John V. B. Johnstone,
Bart., M.P.
J. F. Burke, Esq.
J. W. Childers, Esq., M.P.

Henry Haudley, Esq.
W. H. Hyett, Esq.
G. Kimberley, Esq.
C. E. Lefroy, Esq.
W. Miles, Esq., M.P.
Philip Pusey, Esq., M.P.
H. S. Thompson, Esq.
W. Youatt, Esq.

The Council resolved that Mr. Pusey should be requested to accept the office of Chairman of the Committee.

Rotation of Districts.—The Report of the Committee on the Rotation of Districts for the Country Meetings of the Society having been read, Colonel Challoner, in the absence of Mr. Pusey, brought forward the motion of which Mr. Pusey had given notice at the last Monthly Council, on the inexpediency of holding a country meeting in the South-Wales district in the year 1847, as originally intended by the Council, on account of the contiguity of that district to the one in which the meeting of last year was held at Shrewsbury, and of the total absence of that railway communication between South Wales and the English counties, which the Council now regard as essentially connected with the success of the meeting, and the advantages to be derived from it by the farmers of the district. This motion, having been seconded by Mr. S. Bennett, was unanimously agreed to.

Country Meeting of 1847.—That portion of the Report of the Rotation of Districts' Committee referring to the meeting of 1847, was then adopted; the schedule in reference to the districts proposed for the eight subsequent years being left for consideration at the next monthly meeting.

The district for the County Meeting of 1847 was then declared to be that comprised by the counties of Northampton, Huntingdon, Bedford, Hertford, Oxford, Warwick, Berks, and Buckingham; and the Secretary was directed by the Council to communicate a statement of this circumstance to the authorities in each of the cities and corporate towns throughout the district. The Council also resolved, that the President should be requested to summon a Special Council for Wednesday, the 22nd inst., at one o'clock, for the purpose of receiving memorials from the authorities of such cities or corporate towns in the district as were desirous that the Council should select one of their respective localities as the place of holding the Country Meeting of next year; and of referring the documents so received, with such instructions as the Council may decide, to a Committee for the inspection of the various sites proposed for the occasion by the authorities of the respective cities or towns making such application to the Council, by the date of that Special Meeting. The Committee to consist of the following gentlemen:—

Earl Spencer
J. V. Shelley, Esq.
T. Raymond Barker, Esq.
S. Druce, Esq.

W. R. Browne, Esq.
B. T. B. Gibbs, Esq., or
Humphrey Gibbs, Esq.

The final decision of the question of the particular place of the Meeting for 1847 being left, agreeably with the bye laws, to the Monthly Council, on the 6th of March.

Pleuro-Pneumonia.—Prof. Sewell, at the request of the Council, reported a communication received from Mr. Murray Blacker, in Suffolk, on the subject of the prevalence of the pleuro-pneumonia amongst cattle. Prof. Sewell and Mr. Simonds (Lecturer on Cattle Pathology at the Royal Veterinary College), had fully considered that communication, and were of opinion that the cases alluded to by Mr. Blacker as originating from the introduction among his stock of two newly-purchased cows, one of which became affected in one month, and the other in two months, after their purchase, were not the result of infection; for had infection taken place the attack would, in their opinion, have taken place in a few days. Prof. Sewell referred to the opinion he had stated on former occasions, that this disorder generally yields to early depletion, when recourse is had to that measure in due time.

Mr. D. Robertson's letter "On the conditions under which it would be most desirable that the prize of the Society for thorough-bred Stallions should be offered," was ordered to be reserved for consideration until December, when the prizes for next year would be taken into consideration and decided.

Mr. Agnew, of Manchester, presented to the Council a framed impression of one of the first-class proofs of his engraving after the painting of the "Country Meeting" of the Society, for which the Council ordered their best thanks to be returned.

Mr. Brown called the attention of the Council to sound new potatoes grown by Mr. Fuller, M.P., in Sussex, from diseased potatoes planted in frames.

Mr. Holland, of Dumbleton Hall, presented copies of the form of lease proposed by a committee of the Vale of Evesham Agricultural Association.

The Council then adjourned, over the Easter recess, to Wednesday, the 22nd of April.

A Weekly Council was held at the Society's House in Hanover-square on Wednesday, the 22nd April; present—the Right Hon. Lord Portman, President, in the chair; his Grace the Duke of Richmond; Earl Spencer; Viscount Hill; Lord Braybrooke; Hon. R. H. Clive, M.P.; Sir John V. B. Johnstone, Bart., M.P.; T. Alcock, Esq.; D. Barclay, Esq., M.P.; T. Raymond Barker, Esq.; John Raymond Barker, Esq.; S. Bennett, Esq.; T. W. Bramston, Esq., M.P.; W. R. Browne, Esq.; Colonel Challoner; F. C. Cherry, Esq.; E. D. Davenport, Esq.; C. Hillyard, Esq.; W. Fisher Hobbs, Esq.; J. Hudson, Esq.; G. Kimberley, Esq.; John Kinder, Esq.; J. H. Langston, Esq., M.P.; Col. MacDouall; W. Miles, Esq., M.P.; R. Milward, Esq.; F. Pym, Esq.; Professor Sewell; S. Solly, Esq.; W. R. C. Stansfield, Esq., M.P.; C. Tawney, Esq.; T. Beale Browne, Esq.; Capel Cure, Esq.; A. E. Fuller, Esq., M.P.; A. Majendie, Esq.; A. Ogilvie, Esq.; T. Turner, Esq.; and T. R. Tweed, Esq.

Prize Essays.—Mr. Pusey, M.P., chairman of the Journal Committee, transmitted to the Council the re-

ports of the Judges in the Classes of Essays on Grasslands and Measure Work, from which it appeared that the adjudications stood as follow:—

J.—Grass Lands.

1. *Prize.*—The Essay bearing the motto, "Improvements but not Innovations."
2. *Highly Commended.*— Ditto "Labor omnia vincit."
3. *Commended.*— Ditto "Esse-posses-prodesse."
4. *Commended.*— Ditto "And the land shall yield its increase."
5. *Commended.*— Ditto "Roderic U de Valerae."

II.—Measure Work.

1. *Prize.*—The Essay bearing the motto, "Experientia Docet."

The President then opened the sealed motto-papers containing the names of the authors, corresponding respectively with the prize essays in each of these classes, when the following adjudications were declared and confirmed:—

I. To Mr. John Bravender, surveyor, &c., of Cirencester, Gloucestershire, the Society's Prize of 50*l.*, for the best Essay on the "Advantages or Disadvantages of Breaking-up Grass Land."

II. To Mr. Hugh Raynbird, of Hengrave, near Bury St. Edmund's, Suffolk, the Society's Prize of 20*l.*, for the best Essay on "Measure Work (locally known as Task, Piece, Job, or Grate Work), in its Application to Agricultural Labour; detailing the various descriptions of such work to which any system of measure is applicable, the rates usually paid, and the sum usually earned in a given time, and comparing the effects of such payment with those arising from the payment of wages by time on the direct interest of the employer, and especially on the habits, comforts, and general condition of the employed: the whole deduced as much as possible from personal experience, and affording to parties unacquainted with the practice the means of estimating its advantages, and the information necessary for carrying it out."

The Council having also confirmed the commendations bestowed by the Judges upon the four Essays on "Grass Lands," the President stated that the whole of those communications were highly important and interesting, and reflected great credit on their respective authors, the Judges having found it a difficult task to decide between the competing merits of the Essay to which the prize had at length been awarded and the one which they had so "highly commended."—Colonel Challoner trusted that an opportunity would be afforded to the members of perusing these valuable essays which had been thus strongly commended; and a hope was expressed generally, by the members present, that the authors would place their respective papers at the disposal of the Journal Committee for publication, and the general information of the Society.

Farming Accounts.—The Judges appointed to take into consideration the various Essays sent in to compete for the Society's Prize of 10*l.* for the best method of keeping Farming Accounts, reported to the Council that they did not feel justified in recommending any of the Essays submitted to them, as possessing sufficient merit

in reference to an exposition of such a system of keeping Farming Accounts as would be considered worthy of the prize or the approbation of the Society.

The President then stated that, having conferred with Mr. Tawney, one of the auditors of accounts on the part of the Society, and with Mr. Kimberley, a member of the Council, he would, at the next monthly meeting, submit to the consideration of the Council the propriety and desirableness of appointing a special committee on this important subject, with a request that such committee will report to the Council the result of their deliberation on the best and simplest mode in which the accounts of a practical farmer can be kept in the most clear and satisfactory manner.

Newcastle Authorities.—Messrs. Clark, Fynmore, and Fladgate, solicitors to the Society, transmitted to the Council the duplicate agreement from Newcastle-upon-Tyne, signed by the Mayor, and impressed with the great seal of the corporation of that town, in final ratification of the terms of arrangement which had passed the great seal of the Society at the last monthly meeting of the Council.

Mr. Grey, of Dilston, Mr. Crosby, of Kirkbythore, and Mr. Johnson, of Warkworth, having placed their services at the disposal of the Council, in reference to the carrying out of details connected with the ensuing Country Meeting in the northern district, the Council ordered their best thanks to be communicated to those gentlemen respectively for their kind offers.

Mr. Joseph Rigg, of Abbey House, called the attention of the Council to the desirableness of measures being taken as much as possible for the purpose of enabling the ingenious but small implement maker, of limited means, to exhibit the cheap, simple, and perhaps in many cases most efficient implement, invented by him, at the Country Meetings of the Society.

Conveyance to Newcastle.—The Secretary reported to the Council the steps he had taken, pursuant to the order of the Council, for the purpose of obtaining information on the subject of conveyance by railways and steamers from different parts of the kingdom to Newcastle-upon-Tyne. The various communications connected with these inquiries were laid before the Council, who directed that when replies from the whole of the parties to whom application has been made shall have been received, the Secretary be requested to include the points of information thus obtained, in the classed form of schedule, to be transmitted to the several exhibitors of stock and implements for their guidance.

Railway Liberality.—The Secretary then called the particular attention of the Council to communications he had received from Mr. Creed, secretary of the London and Birmingham Railway Company; from Mr. Herbert, secretary to the London and Dover Railway Company; and from Mr. Swan, secretary of the Newcastle, North-Shields, and Tynemouth Railway Company, conveying, in the most liberal and handsome terms, the great satisfaction it gave to the chairman and board of directors of their respective companies to be enabled to promote the disinterested and national objects of the Royal Agricultural Society of England, by granting a free transit

along their respective lines of railway to the stock and implements intended *bonâ fide* for show at the country meetings. The Duke of Richmond expressed the gratification it gave him to hear of the great liberality which these railway companies had thus shown towards the Society, and he had much pleasure in moving that a vote expressive of the best thanks of the Council, for these communications, and of the high sense they entertain of the value of these most liberal concessions, be conveyed to the chairman and board of directors of these railway companies respectively. This motion was carried unanimously.

Naked Barley.—The President laid before the Council a communication received from the Horticultural Society on the subject of the *Hordeum ægoceras*, a kind of Naked Barley, raised in the Chiswick Gardens from seeds transmitted to England by Captain Monro, who stated them to have been obtained from “the finest Barley grown by the Chinese Tartars.” The seed thus placed at the disposal of the President had not only been distributed by him for trial among parties capable of testing the value of the plant, but having himself received from China, three years ago, a supply of the same kind of seed through a relative of his neighbour, the Earl of Ilchester, he had dibbled the two supplies alongside each other, and in autumn he would report to the Council the result, and furnish seed for further trial. In the mean time, he might state that as this Barley was unfit for malting, he did not anticipate that it would be of any further use in this country than as an early green feed.

Chinese Rapeseed and Oil.—The President also laid before the Council a communication from the Horticultural Society on the Brassica *Chinensis*, or Shanghai Oil-plant, a hardy annual, grown for the sake of its oil over the whole country round that city, but which may be cultivated in almost every kind of soil; and though of no importance in an horticultural point of view, may be raised by farmers for feeding cattle, or on account of the oil which it so abundantly yields. He had likewise placed portions of this supply of seeds in the hands of the Rev. A. Huxtable, and other parties, for trial, and would report the result. The Council ordered their best thanks to be transmitted to the Horticultural Society for these communications, and for the supply of seeds, and the first two parts of the Journal of that Society, with which they were accompanied.

Potato Experiments.—The President took that opportunity of communicating to the Council the results of experiments on the growth of Potatoes from diseased tubers, of which he had on a former occasion reported the progress. These highly interesting and important experiments will be detailed in all their circumstances in a paper which his lordship expressed his intention of preparing for publication in the Journal of the Society. Among the results obtained by Lord Portman in these experiments, the following striking facts may be briefly stated :—

Where eyes were planted which had been scooped out, but allowed to become stale, the greater part of them have failed: but where fresh eyes were planted, all of

them are growing. Of the autumn-planted potatoes all are doing well in dry ground, but only half are doing well in ground less friable, the other half proving rotten, the same effect resulting under the latter condition, both on and under farm-yard dung, as well as in the case of no farm-yard manure at all. All the produce of diseased potatoes has proved to be sound and good; even that experimental portion of it which for the last six weeks prior to ripening has been exposed to a moist heat, such experimental portion, instead of exhibiting any tendency to disease under such condition, furnishing on the contrary finer potatoes—not only sound and mealy, but much superior both in size and quality. From the tubers planted in a box in October, in dry heat, five sprouts have been taken five times successively from each tuber, and planted along with the original tubers in the open ground for a crop: all the plants of this multiplied crop are now growing luxuriantly.

Creteaceous Gypsum.—Mr. MOYLE, of Western Canada, addressed a further communication to the Council on the subject of the results obtained by him in that part of the world with the creteaceous gypsum, to which he had referred in his previous letters; with an opinion, that to the use of this cheap dressing he attributed the great fertility of Canada, and a statement that on one of his own fifty-acre fields, chiefly Wheat, he had last summer grown 40 bushels per acre; the land of his farm having been through the usual rotation of crops for the previous nine years, and the portion on which this Wheat was grown never having had any dressing whatever, excepting one bushel per acre annually of the creteaceous gypsum in question. At the suggestion of the President, it was arranged that Mr. Moyle should be requested to send a ton of this manure to the Society, which would be tried by individual members of the Council, and the practical result of its applicability to the soils of this country ascertained.

Mr. Fuller, M.P., transmitted from the Rev. James Williams one of the Potato-eye scoops used in North Wales, along with a statement of his experience in the improvement in the bulk of the Potato as food after the extraction of the eye, around which the development of the vegetative principle being the strongest, the removal of such portion along with the eye removes, in his opinion, the cause of that “strong” flavour found in the Potato at this season of the year.

Mr. Rogers, of Liverpool, transmitted a communication, suggesting the trenching of ground this year for Potatoes.

Mr. Forsyth, gr. to the Earl of Shrewsbury, transmitted a Pamphlet on the Culture and Economy of the Potato, and also a communication on the subject of Hay-making.

The Commissioners of Excise presented 50 copies of the Parliamentary Report on Feeding Cattle with Malt, for which mark of attention the Council ordered their thanks to be returned.

The Members of Council and Governors present then proceeded to the business of the Special Council.

Special Council.—The Right Hon. Lord Portman, President, in the Chair.

The Secretary laid before the Council the various documents he had received from nine of the cities and corporate towns situate within the district for the Country Meeting of the Society in the year 1847, in consequence of the communication into which, pursuantly to the instructions of the Council, he had entered with the authorities respectively of those places.

The Council having taken into due consideration the whole of these documents, at length selected such four of the localities as appeared from the evidence furnished to the Council to be the best suited for the purpose of the Country Meeting of that year, to which the personal visit of the Committee of Inspection should be directed, and on the respective capabilities of which for such purpose the Committee should be requested to report to the Monthly Council on the 6th of May next, when the final selection of the place of meeting will, agreeably with the bye-laws, be made.

Official agreements.—Mr. Miles, M.P., gave notice that, at the next Monthly Council, he should move, "That, in future, no agreement which may be entered into with local authorities relative to the place of the Annual Country Meeting shall be held good unless the corporate seal, attested by the signature of the Mayor, be applied to such document."

The Weekly Council adjourned to Wednesday, the 29th inst.

NEW MEMBERS.

- Armstrong, Joseph, Higham-place, Newcastle-on-Tyne
- Burton, Thomas, jun., Thurton, Norwich
- Cookson, Thomas, Swinburne Castle, Hexham
- Cœmins, Richard, Tiverton, Devonshire
- Crosby, John, Kirk-by-Thore, Appleby, Westmoreland
- Cuthbert, William, Beaufront, Hexham, Northumberland
- Darby, George, Maskelye, Warbleton, Sussex
- Davison, William, Seaton-Delaval, North Shields, Northumberland
- Firth, John, jun., Wentworth, Rotherham
- Gibson, John, Hayes-terrace, Newcastle-on-Tyne
- Gray, Alexander George, Newcastle-on-Tyne
- Greenfield, James, Brynderwyn, Usk, Monmouthshire
- Haddon, Thomas, Hampton-Lucy, Warwickshire
- Hannam, John, North Deighton, Wetherby, Yorkshire
- Haselwood, William, Hoddesden, Hertfordshire
- Hawkes, Mathew, Melton-Constable, Dereham, Norfolk
- Hawks, George, Newcastle-on-Tyne
- Johnson, T. C., Notton, Wakefield, Yorkshire
- Lamothe, Frederick J. D., Ramsay, Isle of Man
- Laz, William, Kirkbridge, Stanwick-park, Darlington
- Lumsden, John, Mousen, Belford, Northumberland
- Mansel, Lieut.-Colonel, Smedmore, Corfe Castle, Dorset,
- Mansel, John Clavel, Smedmore, Corfe Castle
- Malins, George Wallington Rich., Thelsford, Wellesbourne, Warwickshire
- Maughan, William, Harewood, Yorkshire
- Milburn, John, Crawlerook, Ryton, Newcastle-on-Tyne
- Mitchell, John Hoffe, Deans-Leaze, Witchampton, Wimborne, Dorsetshire
- Moore, John, High House, Morpeth, Northumberland
- Moor, J., Ackworth, Wakefield
- Myers, Henry, Goldsborough, Knaresborough, Yorkshire
- Nixon, William, Union Hall, Newcastle-on-Tyne

- Pettat, Rev. Charles Richard, Aske Rectory, Overton, Hants
- Potts, Forster Charlton, Whorlton, Newcastle-on-Tyne
- Plummer, Matthew, Sheriff Hill, Newcastle-on-Tyne
- Severn, John Percy, Peubyont Hall, Radnorshire
- Smith, Thomas George, Toyston, Alnwick, Northumberland
- Sowery, Stephen, Shieldfield-house, Newcastle-on-Tyne
- Stanton, John, Hayward's-field, Stroud, Gloucestershire
- Tamer, A. O., Brook House, Edmonton, Middlesex
- Taylor, Charles H., Bamburgh, Belford, Northumberland
- Taylor, Hugh, Cramlington, Newcastle-on-Tyne
- Woods, Richard, Osberton, Worksop, Notts.

TO THE EDITOR OF THE FARMER'S MAGAZINE.

SIR,—A letter appears in the *Farmer's Magazine* for April, written by Mr. James Main; the latter part of which states a great error, in saying that "at the present time the expenses of the miller and baker constitute nearly seven-ninths of the cost of the 4 lb. loaf;" whereas, any practical man knows that only two-ninths constitute the expenses of the miller and baker, and seven-ninths the cost of the wheat. I do not suppose any mistake was intended by Mr. Main, and flatter myself this will show a more correct statement.

A CONSTANT READER.

COMPARATIVE ESTIMATE OF THE SEVERAL APPLICATIONS OF MILK.—Allow me to call your attention to the following extract from Mr. Morton's report of a Gloucestershire Vale Farm, in a work published some years ago, by the Society for the Diffusion of Useful Knowledge. He says:—"In feeding calves for the butcher, it generally takes seven weeks to feed them to about a cwt. each; and they consume the following quantity of milk in the seven weeks:—About 10 gallons the first week, 16 the second, 20 the third, 24 the fourth, 27 the fifth, 30 the sixth, and 32 the seventh; so that it takes 159, or say 160 gallons of milk, to produce 112 lbs. of veal. The average money value of the various modes of converting milk into a marketable commodity will stand thus:—

100 gallons of milk produce 112 lbs. of cheese, at 6d. per lb.....	2 16 0
And 5 lbs. of whey butter, at 8d. per lb....	0 3 4
	2 19 4
100 gallons of milk yield 34 lbs. of butter, at 10d. per lb.	1 8 4
And of poor cheese 74 lbs. at 3d. per lb....	0 18 6
	2 6 10
160 gallons of milk produce 112 lbs. of veal, at 7½d. per lb.	3 10 0
But calves newly dropped are worth (deduct).....	0 10 0
	3 0 0
Value of 160 gallons of milk to make veal	3 0 0
Therefore 100 gallons of milk to make veal are worth	1 17 0

Thus making cheese is more profitable than making either butter or veal."

METEOROLOGICAL DIARY.

BAROMETER.			THERMOMETER.			WIND AND STATE.		ATMOSPHERE.			
Day.	8 a.m.	10 p.m.	Min.	Max.	10 p.m.	Direction.	Force.	8 a.m.	2 p. m.	10 p. m.	
March	22	29.20	29.20	34	49	37	W. by South	gentle	fine	sun	fine R.
	23	29.20	29.30	32	52	40	W. by South	brisk	fine	cloudy	fine H.
	24	29.30	29.30	37	50	39	S. W., W.	brisk	fine	cloudy	cloudy R
	25	29.37	29.37	33	48	39	W. N. W.	variable	fine	cloudy	cldy HR
	26	29.47	29.68	36	50	40	W. N. W.	brisk	fine	sun	fine R.
	27	29.79	29.77	36	52	40	W. by N.	variable	fine	sun	fine R.
	28	29.64	29.50	36	53	37	Every way.	brisk	cloudy	cloudy	cloudy R
	29	29.50	30.10	35	47	40	North	gentle	cloudy	cloudy	cloudy R
	30	30.11	30.00	33	50	38	S. East	brisk	fine	sun	cloudy
	31	29.75	29.63	35	55	43	E., S. by W.	lively	fine	sun	fine
	April	1	29.64	29.58	43	50	48	S. West	brisk	cloudy	cloudy	fine R.
2		29.30	29.16	46	56	48	S. W. to W.	strong	cloudy	cloudy	fine R.
3		29.33	29.45	40	51	45	W. to N. W.	strong	cloudy	cloudy	cloudy R
4		29.57	29.20	41	50	49	S. E. to S. W.	variable	cloudy	cloudy	cloudy R
5		29.23	29.18	43	55	47	S. E. to S. W.	variable	cloudy	cloudy	cloudy R
6		29.12	29.00	40	51	41	S. W. to N.	var. gen.	cloudy	cloudy	cloudy R
7		29.09	29.15	37	45	43	N. West	lively	cloudy	cloudy	cloudy R
8		29.20	29.40	41	50	40	N. by West	gentle	cloudy	cloudy	fine R.
9		29.60	29.69	36	53	43	N. by West	gentle	fine	sun	fine R.
10		29.83	29.78	35	56	45	S. to S. W.	gentle	fine	sun	cloudy
11		29.45	29.38	42	55	47	East	gentle	cloudy	cloudy	fine R.

ESTIMATED AVERAGES OF APRIL.

Barometer.		Thermometer.		
High.	Low.	High.	Low.	Mean.
30.54	29.2	74	29	49.9
Real Average Temperature of the period.				
High.	Low.	Mean.		
32.66	39	45.83		
North and N. East Winds.. 5½ days.				
East and to South..... 6½				
South and South West..... 6¾				
West and to North..... 11				

WEATHER and PHENOMENA.—To chronicle the above singular period, the rainy days are marked by capitals. 22, very fine early; 23, variable; hail showers; wind; 24, showery, after a fine morning; 25, fine morning; hail; 26, generally fine; 27, some thunder; 28, compound arrangement of clouds, heavy showers; 29, fine gleams, overcast afternoon; 30, fine morning; changeable; 31, very beautiful.

LUNATIONS.—New moon 27th day, 5 h. 50 m. morn.

April 1, changeable; 2, windy—almost storm; 3, cool; fine forenoon; showers; 4, exceedingly wet; night windy; 5, gloom; profuse showers; 6, similar; 7, wet almost entirely; 8, damp; mistling rain; 9, beautiful and sunny; a hint of rain; 10, very fine, spring-like; 11, changeable; 12, warm, starchy clouds, and bad evening; 13, changeable; showers; 14, fine forenoon only; 15, again rainy; 16, cirro stratus; clouds; mild; 17, fog, followed by close rain; 18, brisk, drying air; dry day; 19, a second dry day; 20, very fine till noon; cold, with some hail, or light showers; cold, fine night.

LUNATIONS.—First quarter, 3rd day, 5 h. 12 m. afternoon; full moon 11th, 5 h. 55 m. afternoon; last quarter 8 h. 24 m. afternoon.

JOHN TOWERS,]

Maidenhead Thicket.

STALLIONS FOR THE SEASON.

His dam won that sweepstakes; his sire won that race.

Name.	Colour.	Age.	Pedigree.	Performances.	Principal Performance.	No. of Winners out by.	Sire of	Standing at	Apply to	Price.
Advocate	bay	14	by Partisan, out of Duckling, by Phantom	started 7, won 8	won the Bibary Cup.	unrtd.	Evenus	Pickaw, Corsham, Wilks	Mr. Barton	6 gs., h. b. 3 gs.
Alphacids	chestnut	16	by Sultan, out of Arabissa, by Quiz	started 4, won 2	won the Lincoln's Inn S.	2	—	Casle le Brunwich, Birmingham	Mr. R. Gibson	10 gs.
Arch	bay	11	by Camel, out of Garcia, by Octavian	started 8, won 2	won £100 at Newmarket	unrtd.	—	Stockbridge, Edge-ware	Mr. Isaac Sadler	5 gs., h. b. 3 gs.
Ascorins	brown	7	by Priam, out of Lucy, by Muley	started 22, won 1	won £50 at Newcastle	unrtd.	—	Edgewarebury, Edge-ware	Mr. E. Newman	5 gs., h. b. 3 gs.
Auckland	brown	7	by Champion, out of Maid of Honour, by Champion	started 9, won 5	won £700 at Ascot	unrtd.	—	Eccleston, Chester	Mr. Hartshorn	10 gs., h. b. 5 gs.
The Bard	bay	13	by Waverley, out of Castrelina, by Casvel	started 27, won 10	won a Produce Stake at York	unrtd.	Ada	Skipton, York	Mr. Watson	5 sovs., h. b. 2 sovs.
Barnacles	chestnut	13	by Cain, dam by Bourbon	started 25, won 11	won the Goodwood S.	unrtd.	—	Bath	Mr. Harvey	5 gs., h. b. 3 gs.
A Bay Horse	—	9	by Malato or Starch, out of Young Petunia, by Rainbow	started 4, won 1	won £100 at Hampton	unrtd.	Cowl	Stockwell, Surrey	Mr. Lowry	2 gs.
Bay Middleton	bay	13	by Sultan, out of Cobweb, by Phantom	started 7, won 1	won the Derby	49	—	Turf Tavern, Doncaster	Mr. W. Channing	15 sovs. (25 subs.)
Bay President	bay	14	by Akarius, out of Lady Elizabeth, by Akarius	never appeared	—	unrtd.	Cocoa Nut	Wadsworth, Thirsk	Mr. J. Foxton	5 gs., h. b. 2 gs.
Belram	chestnut	17	by Sultan, out of Miss Camd'ry, by Stamford	started 17, won 8	won Drawing Room S.	11	—	Burgilly, Stamford	Lord Exeter	10 sovs.
Belorado	chestnut	8	by Bahazar, out of Alice, by Langar	started 24, won 1	won the Brighton Stakes	unrtd.	Mungo Parke	Stockwell, Surrey	Mr. Lowry	5 gs., h. b. 3 gs.
Belzoni	brown	13	by Blacklock, out of Mamma, by Dick Adams	started 19, won 11	won the Ascot Outlands	25	The Baron	Lutterworth, Leicestershire	Mr. Lucas	10 gs., h. b. 3 gs.
Birdcatcher, Irish	chestnut	25	by Sir Hercules, out of Guticoli, by Bob Booty	started 35, won 6	won the Madrats	12	—	Newmarket (Access.)	P. Mc Donnell	25 gs. (40 subs.)
A British Yoman	bay	6	by Liverpool, out of Fancy, by Osmond	started 8, won 4	won the Champagne	unrtd.	Our Nell	Rockliff, Strath	Mr. Moffat	5 gs., h. b. 2 gs.
Bran	chestnut	15	by Humphrey Clunker, out of Velvet, by Oiscan	started 3, won 3	won the Swinley Stakes	20	Julian	Asterly, Southampton	Mr. Chapman	5 gs., h. b. 3 gs.
Cesar	bay	10	by Sultan, out of Cobweb, by Phantom	started 6, won 8	won the Tuddesworth	4	—	Six-mile Bottom, Newmarket	—	10 gs., h. b. 5 gs.
Cain	bay	24	by Paulowitz, dam by Paymator	started 31, won 12	won Glo'stershire Stake	40	Barnacles	Pompehill Farm, Fazeley	Mr. E. Ward	10 gs., h. b. 4 gs.
Calmeek	bay	13	by Zingance, dam by Rubens	started 37, won 12	won Gouthamby Stake	unrtd.	—	Stockwell, Surrey	Mr. Lowry	10 gs., h. b. 4 gs.
Camel Junior	bay	7	by Camel, out of Velocity, by Blacklock	never appeared	—	unrtd.	—	The Lodge, Malton	—	12 gs. (winners and dams of winners of £30, 5 gs.)
Camelino	bay	10	by Camel, out of Maria, by Waterloo	started 31, won 10	won the Prendergast	unrtd.	—	Mount Pleasant, Bedford	Thomas Morgan	7 gs.
Cardinal Puff	brown	12	by Pantaloon, out of Puff, by Waterloo	started 33, won 17	won the Chester Cup	unrtd.	—	Tickhill Castle Farm, Warwick	Mr. W. Hornshaw	10 gs., h. b. 5 gs.
Cantonite	bay	7	by Muley Molech, out of Jubilee, by Cation	started 33, won 16	won Croton Park Cup	unrtd.	—	Warwick	Messrs. Rose and Stanley	5 sovs., h. b. £2 10s.
Charles XII.	brown	10	by Voltaire, out of Wagtail, by Prime Minister	started 34, won 19	won the St. Leger	unrtd.	—	Willstead Paddock, Mitchell Grove, Finsdon	Messrs. Tattersall	12 gs.
Chatham	chestnut	7	by the Colonel, out of Huster, by Camel	started 16, won 3	won the Criterion	unrtd.	—	Willstead Paddock, Mitchell Grove, Finsdon	Mr. W. Wyatt	7 gs. (winners and dams of winners 5 gs., h. b. 3 gs.)
Clarion	bay	10	by Sultan, out of Clara, by Filho da Puta	started 30, won 11	won the Cesarewitch	unrtd.	Walpole	Astley, Shrewsbury	J. B. Almon Esq.	5 gs., h. b. 3 gs.
Clear-well	grey	16	by Jerry, out of Lisette, by Imambetonian	started 12, won 6	won the Clearwell	40	DEgville	Cawston, Norfolk	Mr. Bond	7 gs., h. b. 2 gs.
The Colonel	chestnut	21	by Whisker, dam by Delphin	started 16, won 9	won the St. Leger	7	—	Lees Farm, Berwickshire	George Tait	10 sovs., h. b. 5 sovs.
Corwick	bay	18	by Filho da Puta, out of Stella, by Sir Oliver	started 28, won 6	won the Chester Cup	6	Attila	Falcon Hotel, Bromyard	Mr. Devereux	10 sovs., h. b. 5 sovs.
Corvation	bay	8	by Sir Hercules, out of Ruby, by Rubens	started 17, won 2	won the Derby	unrtd.	—	Willstead Paddock	Messrs. Tattersall	12 gs.
Cotterstone	bay	6	by Touchstone, out of Emma, by Whisker	started 14, won 2	won the Derby	unrtd.	—	Althorp, Northampton	Mr. Elliot	15 sovs. (40 subs.)
Counseller	chestnut	7	by Hundig, out of Catelyn, half bred	started 30, won 23	won Atterley Handicap	unrtd.	—	Glaston, Newport Pagnell	Mr. Wesley	3 gs.
The Count	bay	15	by Figaro, out of Catey, by Comus	started 18, won 13	won Stockton Handicap	unrtd.	—	Swan, Uppingham	Mr. Farmer	—
Croton Oil	bay	5	by Physician, dam by Capstun	started 18, won 3	won Drawing Room S.	unrtd.	—	Wiseton, Rawby, Yorkshire	—	7 gs., h. b. 3 gs.
Defiance	bay	22	by Whalbone, out of Defiance, by Rubens	started 1	—	61	The Emperor	Stockbridge	Mr. Isaac Sadler	15 gs. (20 subs.)
Delham	brown	15	by Filho da Puta, out of Lenatic, by Prime Minister	started 17, won 6	won a Royal Plate	1	Insanly	Rose and Crown, Malton	—	6 gs., h. b. £2 5s.

The Day of Algiers	bay	10	by Priam, dam by Bustard	started 13, won 3	won the Chester Cup	untried.	Malcom	Hampton Court	Mr. Worley	10 svs., h. b. 5 svs
The D-ear	black	12	by Dr. Syntax, dam by Lot-ry	started 44, won 29	won the Hooon Stakes	3	Arkwright	Stapel Inn, Gutterick	Mr. Speeding	20 svs., (40 subs)
Don John	bay	11	by Trump or Waverley, dam by Conus	started 10, won 9	won St. Leger	2		The George, Melfor	Mr. Taylor	20 svs., (30 subs)
The Earl of Richmond	brown	9	by Mulcy, out of Prina Donna, by Southeyton	never appeared.		untried.		The George, Melfor	Mr. Watson	7 gs., h. b. 3 gs.
Emilian	brown	6	by Tom-stone, out of Queen of Trumps, by Velocipede	started 18, won 1	won Lyne Park, Newport	untried.		The George, Melfor	Mr. Whitfield	5 gs., h. b. 2 gs.
Emilius	bay	26	by Fanilus, out of Memina, by Smolensko	started 11, won 12	won the Southampton S.	untried.		The George, Melfor	Mr. P. Newman	20 svs., (12 subs)
Epitus	chestnut	12	by Langart, out of Olympia, by Stamford	started 31, won 12	won Copeland Handicap	untried.		The George, Melfor	Mr. Patterson	12 gs., h. b. 2 gs.
Erymus	bay	19	by Mules, out of Eliza Leeds, by Conus	started 13, won 4	won Drawing Room S.	untried.		The George, Melfor	Mr. Blamire	5 svs., h. b. 2 gs.
Oalear	bay	12	by Mules, out of Diarioletta, by Annadis	started 13, won 5	won Manchester Cup	untried.		The George, Melfor	Mr. B. Smith	5 svs., h. b. 2 gs.
Gardhan	bay	9	by Falcon, out of Meta, by Trump	started 20, won 5	won Hereford Staks	untried.		The George, Melfor	Mr. Worley	10 svs., h. b. 5 svs.
Gibraltar	bay	9	by Mulcy, out of Young Sweet Pea, by Godolphin	started 9, won 5	won the Port	untried.		The George, Melfor	Thomas Morgan	10 gs., h. b. 3 svs.
Gilbert Gurney	chestnut	11	by Mulcy, out of Miss Orville, by Pentulum	started 19, won 4	won Wetherington S.	1	The Traveller	Mount Pleasant, B. dford	Mr. Painter	20 gs., (40 subs)
Gladiator	chestnut	13	by Partizan, out of Pauline, by Mores	started 1, never appeared	won the Derby	13	Sweetmeat	Dean's Hill, St. dford		20 gs., (40 subs)
The Gleaner	chestnut	4	by Bran, out of the Romby, by Peveller	never appeared	run second	untried.		Cockhill, Woodford		3 gs.
Harkway	chestnut	12	by Economist, dam by Nabocklisk	started 38, won 15	won Goodwood Cup (2)	6	Princess Royal	Bush wry, Wolverhampton		12 gs., h. b. 3 gs.
Hern	brown	18	by Bustard, dam by Oville	started 41, won 1	won Liverpool Cup	2	The Witch	Asterley, Sulop	Mr. Chapman	5 gs., h. b. 3 gs.
Herman Pla off	brown	10	by Rookwood, dam by Conus	started 10, won 6	won Northumberland Pl.	untried.	The Co-sack Maid	Middlethorpe, York	Mr. Smallwood	10 gs., h. b. 5 gs.
Highlander	brown	6	by Buckingham, out of Cic-pater, by Camel	started 3, won 1	won match, at Goodwood	untried.		Sto Kwell, Surrey	Mr. Lowry	5 gs., h. b. 2 gs. (win-ner, and dams of winners <i>gralas</i>)
The Hydra	chestnut	11	by Sir Hercules, out of Zebra, by Partizan	started 19, won 5	won Croxton Park Cup	1		Toultoun, York		5 gs., h. b. 2 gs.
Humphrey	bay	11	by Sambeck, dam Oceana, by Cerberus	started 46, won 16	won Stockton Plate	untried.		Sawdon, Seapley?	Mr. R. Coverley	5 gs., h. b. 2 gs.
Jabel	grey	6	a pure Arabian	never appear d.		untried.		Greencombe, Thimton	J. Carew, Esq.	5 gs., h. b. £2 12-6d.
Jamal	grey	9	by Jerry, out of Coramba, by Fillo da Pata	started 9, won 2	won a Royal Plate	untried.		Sudbury, Suffolk	Mr. W. Brown	5 gs., h. b. £1 10s.
Jeremy	grey	17	by Jerry, out of Margressa, by Muley	started 9, won 6	won the Wokingham	untried.		Rowcliffe, York		5 svs.
Johny Boy	brown	14	by Purcus, out of Aldressan	started 4, won 4		untried.		Burwell, York		10 svs.
John of Gaunt	grey	11	by Purcus, out of Mon, by Partizan	started 38, won 23	won Newmarket Stakes.	untried.		Quadenham, Norfolk	Mr. S. Cullson	10 svs.
John of Gault	grey	11	by Cuth, out of Margaret, by Edmond	started 4, won 1	ran second for the Durby	2	Ionian	Hampton Court	Mr. Worley	15 svs.
King	chestnut	16	by Stubb, dam (sister to Corweb) by Phanton	never appeared		21	Burgundy	Hampton Court		10 gs., h. b. 5 gs.
Ilthrid	bay	5	by Touchstone, out of Verena, by Velocipede	started 3, won 2	won Liverpool 1 Leger	untried.		Lichfield Castle, Rothel-ham	Mr. Harshaw	10 gs., h. b. 5 gs.
Kremlin	brown	10	by Sultan, out of Francesca, by Partizan	started 19, won 6	won Cleveland Cup	1	Hedgehor	High Wycombe, Bucks	Mr. Kerby	7 gs., h. b. £2 12-0d
Laurenet	brown	11	by Liverpool, out of Otis, by Buzzard	started 41, won 20	won the Assot Cup	untried.		Marion, York	Mr. Kelly	15 gs., h. b. 4 gs.
Laurelot	brown	9	by Camel, out of Emma, by Whisker	started 16, won 9	won the St. Leger	1	Luminary	Bangor Castle, Ireland	Mr. Wilsor	5 gs.
Laurel	brown	22	by Blackbeck, dam by Prime Minister	started 27, won 12	won 8 Gold Cups	13	Wesena	Stockwell, Surrey	Mr. Lowry	12 gs., h. b. £2 10s
The Little-known	bay	10	by Muley, out of Lucetta, by Zodiac	started 3, won 1		untried.		Knottledge, Ferry-hidge	Mr. Smallthage	5 gs., h. b. £2 10s
Lord John	chestnut	12	by Priam, out of Signoria, by Champion	started 3, won 1	won £300 at Liverpool.	1	Cranebrook	Belmont, Edinburgh	Mr. D. Douglas	7 gs., h. b. 3 svs
Mauco	brown	12	by Emilus, out of Mustard, by Merlin	started 17, won 1	won St. Leger	2	Poromus	Rehill Farm, Fazeley	Mr. E. Ward	12 gs., h. b. 4 gs.
Mcbourne	brown	12	by Humphrey Clinker, dam by Cervantes	started 16, won 9	won Palatin Stakes	untried.		Kildare, Ireland		6 svs., h. b. £2 10s
Mcroy	grey	12	by Drome, out of Plead, by Bob Bowd	started 16, won 6	won the maidrds	untried.		Stamile Bottom, New-market		8 gs., h. b. 4 gs.
Metcor	chestnut	7	by Velocipede, out of Dildo, by Whisker	started 2, won 1	won 2000 guineas Stakes	untried.		Newmarket	Messrs Barrow	7 gs., h. b. 3 svs
Montreal	bay	10	by Langar, out of Legend, by Merlin	started 17, won 6	won Newmarket St. Leger	1	Alice Hawthorn	Stockwell, Surrey	M. Lowry	40 gs., (40 subs)
Muley Moloch	brown	13	by Muley, out of Vandy, by Dick Amory	started 19, won 17	won the Port	66	Jewboy	Goodwood, Chichester	Mr. Kent	5 svs.
Mus	bay	4	by fozzare, out of Young Mouse, by Godolphin	started 42, won 1	won Orleans Cup	2		Purcus, Fazeley	Mr. G. Holmes	5 svs., h. b. 2 gs.
Naimunger	brown	14	by Vo faire, out of C. prius, by Partizan	never appeared		untried.		Bushy, Stamford	Lord Exeter	15 svs.
Nutwith	bay	22	by Tomboy, dam by Conus	started 7, won 3	won St. Leger	untried.		Carston, Ruzby	Messrs Ffytton	10 svs., h. b. 5 svs.
Panuloon	chestnut	9	by Castrel, out of Idalia, by Peruvian	started 7, won 6	won Warwick St. Leger	25	Satirist	Belgrave Lodge, Leicester	Mr. E. Bailey	7 gs., h. b. 5 svs.
Peakin	chestnut	11	by Bivram, out of Komable, by Rowton	started 1, never appeared		untried.		Harker Lodge, Carlisle	Mr. Blamire	5 svs.
Perkin Warbeck	chestnut	11	by Buzzard, out of Cowbe, by Phanton	started 4, won 2	won the Biddesworth	3	Fila Persian Lady	White Swan, Stockton	Mr. R. Mundy	5 svs., h. b. 2 svs.
Physican, Young	bay	9	by Physican, out of Spawley, by Southsayer	never appeared		untried.				

(Continued on next page.)

STALLIONS FOR THE SEASON—(Continued).

Name.	Colour.	Age.	Pedigree.	Performances.	Principal Performances.	No. of Wins out by.	Sire of	Standing at	Apply to	Price.
Plenipotentiary. Precursor	chestnut	15	by Emilius, out of Harriet, by Pericles	never appeared ..	won the Derby	29 untried.	Poison	Horsehenth, Cambridge Kent (Green-street, Kent)	Mr. W. Martin ..	15 sovs.
The Prior	chestnut	7	by Muley Moloch, out of Rebecca, by Lottery	started 8, won 7 ..	won £140 at Chester ..	untried.	Ninety-one	Erdington, Birmingham	Mr. Moss	5 gs., h. b. 2 gs.
Prime Warden	bay	12	by Cadliand, out of Zarina, by Morisco ..	started 10, won 3 ..	won Newton St. Leger ..	untried.	Ninety-one	Hednesford,	Mr. J. Shepherd ..	5 sovs., h. b. 5 gs.
Prizefighter	chestnut	6	by Gladiator, out of Barbara, by the Laird ..	started 5, won 2 ..	won Great Yorkshire S. ..	untried.	Ninety-one	Bitterswell, Lutetworth	Mr. C. Kent	10 gs., (dams of winners, 2 gs.), h. b. 3 gs.
The Provost	brown.	10	by the Saddler, out of Rebecca, by Lottery ..	started 14, won 1 ..	won Scarborough Stake ..	untried.	Lord Exeter	Gurghley, Stamford ..	Lord Exeter	20 sovs. (25 subs.)
Ramadan	bay	9	by Beiraun, dam by Reveller ..	started 6, won 1 ..	won £50 at Newmarket ..	untried.	Lord Exeter	George & Diamond, Tadcaster ..	7 gs. (winners and dams of winners)	5 sovs., h. b. 2 sovs.
Ratan	chestnut	5	by Buzzard, dam by Picton ..	started 7, won 3 ..	won the Criterion	untried.	Lord Exeter	Manor-House, Catterick	Mr. Dale	5 sovs., h. b. 2 sovs. (grats.)
Ratcatcher	chestnut	10	by Langar, out of Rufina, by Blacklock ..	started 65, won 25 ..	won the Cleveland Cup ..	3	Dog Billy	Willensden Paddocks ..	Messrs. Tattersall ..	10 gs., h. b. 5 gs.
Redbank	bay	13	by Sandbeck, out of Johanna, by Selim ..	started 31, won 12 ..	won the Mostyn Stake at Holywell	4	Cherokee	Linton, Harlow, Essex	Mr. C. Marsen ..	10 gs., h. b. 5 gs.
Riddleworth, } Brother to .. } Robert-de-Gorham }	chestnut	13	by Emilius, out of Filagree, by Sootbsayer ..	never appeared ..	.....	untried.	Dog Billy	Ashby-de-la-Zouch ..	Mr. T. Bowman ..	5 sovs., h. b. 2 sovs.
Rubens, Young } First called } HonestRobin }	chestnut	7	by Sir Hercules, out of Duvernay, by Emilius ..	started 20, won 7 ..	won second for the Derby ..	untried.	Dog Billy	Hain, Arundel .....	.....	20 sovs.
The Saddler	chestnut	20	by Robin Adair, out of Euphrasia, by Rubens ..	started 23, won 8 ..	won the Clifton Stake ..	—	Dog Billy	Pickwick, Corsham,	Mr. Eaton	5 gs.
St. Francis	bay	18	by Waverley, out of Castrelina, by Castel ..	started 23, won 9 ..	won the Doncaster Cup ..	23	The Shadow	Wills	Mr. T. Warren ..	10 sovs., h. b. 9 sovs.
St. Martin	bay	11	by St. Patrick, out of Surprise, by Scout ..	started 49, won 28 ..	won the Ascot Cup	untried.	The Shadow	Elberston, Scarborough	Mr. P. Pitt	10 gs., h. b. 3 gs.
Sambo	brown.	12	by Acteon, out of Galina, by Walton ..	started 19, won 9 ..	won the Danvers Cup ..	5	Pythia	Newmarket	Mr. F. Croft	7 gs., h. b. 2 gs.
Scroggins	black	12	by Muley, out of Roscha, by Walton ..	never appeared ..	.....	untried.	Pythia	Sheffield	Mr. T. Briggs ..	5 gs., h. b. 2 gs.
Scutari	bay	9	by Sultan, out of Velvet, by Oiscant ..	started 23, won 9 ..	won second for St. Leger ..	1	Fistruiff	Swan, Tadcaster	Mr. J. Jackson,	5 gs., h. b. 2 gs.
Seahorse	bay	7	by Camel, out of Seabreeze, by Pacowitz ..	started 22, won 9 ..	won Newmarket Stakes ..	untried.	Fistruiff	Pattingham, York ..	of Hull	10 gs., h. b. 2 gs.
Sir Hercules	black	20	by Whitebone, out of Peri, by Wandere ..	started 9, won 2 ..	won Wolverhampton L. ..	untried.	Fistruiff	Stockbridge	Lord Exeter	5 gs., h. b. 3 gs.
Sir Isaac	brown.	15	by Camel, out of Arachne, by Filio da Fuda ..	started 7, won 3 ..	won a Produce at Liverpool ..	39	Fistruiff	Whittonhouse, Salisbury	Mr. Isaac Sadler ..	25 sovs. (40 subs.)
Slane	bay	13	by Royal Oak, dam by Orville ..	started 18, won 9 ..	won Waterlo Shield ..	4	Fistruiff	Burghley, Stamford ..	Lord Exeter	10 gs., h. b. 3 gs.
The Squire	grey.	8	by the Saddler, dam by Mimos ..	started 17, won 1 ..	won Newcastle Leger ..	untried.	Fistruiff	Stockbridge	Mr. Isaac Sadler ..	5 gs., h. b. 3 gs.
Staveley Moloch ..	bay	8	by Muley Moloch, dam by Figaro ..	never appeared ..	.....	untried.	Fistruiff	Whittonhouse, Salisbury	The Stud Group ..	25 sovs. (40 subs.)
Theon	brown.	9	by Emilius, out of Maria, by Whisker ..	started 6, won 3 ..	won Doncaster two-year-old Stake	1	Fistruiff	Yardley, Birmingham	Mr. Holloway ..	10 gs., h. b. 3 gs.
Thiark	bay	8	by Vellaire, dam by Whisker ..	started 31, won 11 ..	won Wolverhampton S. ..	untried.	Fistruiff	Hampton Court	Mr. Worley	25 sovs. (40 subs.)
Touchstone	brown.	15	by Camel, out of Banier, by Master Henry ..	started 21, won 16 ..	won St. Leger	27	Fistruiff	Hampton Court	Mr. Worley	5 gs.
The Tulip	chestnut	15	by Wamba, out of Young Chryseis, by Dick Andrews ..	started 3, won 1 ..	won a Produce at Chester ..	8	Fistruiff	Gornborough, Sheriff Hutton ..	Mr. Armstrong ..	5 gs., h. b. 2 sovs.
The Ugly Duck	bay	5	by Venison, out of Monstrocity, by Plenipotentiary ..	started 3, won 3 ..	won Wolverhampton S. ..	untried.	Fistruiff	Crown & Anchor, Ripon	Mr. R. Blacker ..	5 gs.
Veloicopede	chestnut	21	by Blacklock, dam by Juniper ..	started 5, won 8 ..	won 29.0 guineas Stake ..	untried.	Fistruiff	Eaton, Chester	Messrs. Weather-	31 sovs. (40 subs.)
Venison	brown.	20	by Partizan, out of Fawn, by Smolensko ..	started 12, won 7 ..	won the Liverpool Cup ..	116	Fistruiff	Dymock, Ledbury	by	10 gs., h. b. 5 gs.
Voltaire	brown.	13	by Blacklock, dam by Phantom ..	started 22, won 16 ..	won Portland Handicap ..	18	Fistruiff	Queen of Trumps	Mr. Young	10 sovs., h. b. 3 sovs.
Volfaire, Young } The Wild Hero }	bay	8	by Volfaire, out of Nitocra, by Whisker ..	never appeared ..	won Doncaster Cup	61	Fistruiff	Alarm	Mr. John Day ..	25 gs. (40 subs.)
Yaxley	brown	14	by Sandbeck, out of Johanna, by Selim ..	started 9, ..	.....	untried.	Fistruiff	Charles XII	Mr. Stephenson ..	15 gs.
				never appeared ..	.....	untried.	Fistruiff	Cherry Burton	Mr. J. Coupland ..	5 gs., h. b. 2 gs.
				never appeared ..	.....	untried.	Fistruiff	Ravellife, York .....	.....	5 sovs.
				never appeared ..	.....	untried.	Fistruiff	Sheriff Hutton Park ..	.....	5 gs., h. b. 2 gs.

CALENDAR OF HORTICULTURE.—MAY.

Retrospect.—Since the date of our last the weather assumed an entirely different character. The Equinox occurred on the 20th of March, previous to which there were four nights of the keenest frosts of the year. On the 20th evening, beautiful and brilliant, with the thermometer at 30° (receding to 24° by sunrise of the following morning), a change of wind took place; and on the 21st clouds came up from south-west, with a rise of 20 degs. from the lowest temperature, and rain fell before night.

The weather then, at that most critical period, was broken up, and underwent an entire revulsion. Subsequently to the time when we now commence this calendar, there have been twenty days with rain to a greater or less extent. On the whole, rain has fallen in excess, so as to impede gardening in some of its nicest operations; for among these are to be reckoned the proper loosening and pulverisation of the soil, especially at a time when all the temporary crops ought to be sown or planted.

April then, to its first half, has been more than showery—absolutely wet—affording a complete contrast in its weather to that of late years; so far it is propitious, but no farther; since the precursors of this rainy visitation—the biting and rigorous frosts of the third week of March—had done a good deal of mischief to the bloom of apricots, and of wall-trees generally, and, we fear, to the berry-bearing shrubs. A dry March is a great blessing to field and garden; but we do not consider as such frosts in the third and fourth weeks, which ought always to be bland and sunny. We must now wait results; but much of good, experience does not permit us to anticipate.

Broccoli has been fine, and extremely early; but it is not destined to continue long this year. Cabbage also is early. Asparagus is rising, and, if the weather become more sunny, will be plentiful by the first of May. But we see a probability of numerous failures in spindle-rooted plants and lettuces, because very little good seed was raised last year, owing to the wretchedly cold and wet weather of July. One circumstance of precocious development is worthy of record: the exposed vines were in complete bud by the 25th of March, the Hamburgs on a S.E. wall being more forward than any other sort, and equally so as those in the latest vinery: this we never before witnessed.

VEGETABLE GARDEN.

FIRST WEEK.—Sow small salads immediately; and if in request, repeat the sowing every week; always recollecting that as cress is more tardy than mustard, its seed should be sown three days sooner: sow *lettuces* also.

Peas.—Sow the tall-growers, giving plenty of manure at the bottom of a six-inch deep trench, over which the soil ought to be raised in the form of a low rounded ridge. Soil for peas ought to be rich in old manure added in the autumn—that at the bottom may be applied now. These remarks are founded upon the practice of a grower, who

produces most surprising crops, by choosing ground (loam) wherein, for years, he had cultivated dahlias for show: replete with vegetable and very old nitrogenous matter, his peas received from it nutriment so ample, that both foliage and fruit were splendid, the latter three times perhaps more abundant than what is usually obtained.

Broad-beans.—Plant again; and also insert the second crop of kidney-beans and runners. The seeds of each ought to go into three inch drills, previously opened and warmed by the sun. Both like ground in good heart; but the runners ought to be on ground trenched, and manured at bottom.

Carrots, parsnips, and beet.—If the early sowings have failed—and we fear this will be the case in too many instances, because so little seed was saved in 1845—sow again immediately, soaking the seed overnight.

Borecole, and Scotch kale, Brussels sprouts, savoy, and the first crop of purple cape broccoli, should be sown, or in the—

SECOND WEEK.—*Sea-kale.*—Clear the beds of weeds; cut and make even the surface of the stools, so as to ensure a number of young eyes, which will not be so apt to run to seed; cover the beds with river sand, mixed with decayed manure, and a sprinkling of pure guano; and then make the plat level by the rake: it may be very proper to scatter salt over the intermediate spaces, but not within a foot of the plants.

Asparagus-cutting will proceed; always select the best head, and leave smaller successions, so as not to deprive any root of all its shoots. Some advise to pour guano-water along the rows as the plants grow, and to use abundance of salt. Our experience is as yet inconclusive; but in watering, we would never venture at first to add more than one ounce of the former to a gallon of water, which will suffice for three yards of a single row. As to salt, apply it in the alleys; and then, in rainy weather, it will be washed down to, and among the dung that was put into them last autumn, and thus will kill insects, and become safe as a top dress, at the removal of the manure next autumn.

Sow radishes of every sort now, and again, if required; also lettuces.

THIRD AND FOURTH WEEKS.—Repeat kidney-beans for the August supply. *Cauliflowers* are now sown for October and November; and onions, to draw young.

If beans be in bloom, and begin to show the abortive tops, nip the latter off, and hoe the ground. Hoe and stick peas, and destroy weeds everywhere.

Cucumbers, either for pickles, or for late open ground supply, may be sown over a hole containing a barrow of warm dung, covered with six inches of very nice soil. The spot ought to be sunny, so as to admit the full exposure of the shoots to its light. Till the seeds push, and the young plants be strong, a hand-light over them will be very serviceable.

FRUIT DEPARTMENT.

Melons ought to come on well; but if rainy, dark

weather continue, they will have neither colour nor flavour: in such seasons, when dung beds and linings are liable to be suddenly chilled, the advantage of hot water in tanks and tubes must be perceived. Cucumbers also are equally favoured with this most equal and ever certain appliance. The benefit of it extends to nurse and succession pines, though we admit that the sweet steam of dung and leaves is very beneficial to their herbage.

Strawberries in pots are gone by; but when grown in the open soil of a large brick range of pits, set in rows a foot apart, the plants about six-inches asunder, extending from back to front, and the spaces covered with flat tiles, a glorious crop is secured, provided care be taken to give plenty of air. £20 have been realized in a season, by selling the fruit in May to fruiterers who go from place to place, and purchase at from 5d. to 8d. per ounce. *In the open air* this crop is looking well; the centres are full and the leaf fine; short grass or fine straw, ought to be laid under and about the trusses to prevent dirt and splashing by heavy rain. If time be allowed to pass a string attached to sticks about the height of the tallest trusses, they would be kept erect, and some persons scruple not to assert, with the advantage of more than twice the quantity of good fruit.

The *first vinery* ripens its fruit, and moisture is withheld, but sun and air are vital; not, however, by the direct ray of the former, for though its power be felt, it should always be moderated by the natural screen of an ample foliage. The later vinery of Hamburgs will be coming on to fruit, and may be mainly assisted by a moist atmosphere. *West Saint Peters* is, and should be, very late; fire is of no use to it, unless the season be very cold, till September. The Muscats ought to be very warm at the periods of blossoming and stoning, and every cluster should be severely thinned when the

berry is of the size of a small pea. Worse economy does not exist than in permitting a crowd of berries at the cost of size, colour, and flavour; moreover, thickly loaded clusters, and too many of them, task the tree too severely.

GREEN-HOUSE, AND PLANT-PITS.

Air, and plenty of it; the removal of dead and moulding leaves; an ample supply of water, so as to sustain growth; due potting when the roots want more room: these are the general essentials. Charcoal drainage appears the best; it cannot become putrid, and retains moisture, while it purifies the water.

PLEASURE-GROUNDS.

Sow and transplant annuals of every favourite kind. At the middle of the month, having prepared the parterres with fresh soil and appropriate manure, plant the geraniums, verbenas, lobelias, and other rich ornaments, which now render our fine gardens so eminently beautiful. Heaths and hair-rooted plants require bog or heath soil; lobelias obtain colour from leaves nearly decayed; rich fresh loam, and leaf mould, or the reduced droppings of old mushroom beds, are excellent for roses, fuchsias, pelargoniums, and most other plants that are to be removed from pits, &c., with balls entire.

Gravel-walks should always be cleared of short-grass, sagina, and other rubbish, before they be fresh gravelled and rolled. Lawns ought to be made free of daisies, dandelion, and the like, and if poor, should be dressed with a little soot, fine sandy earth, with a hint of guano, or nitrate of soda, especially in showery weather. Sweeping, rolling, and mowing, ought to be regularly attended to. The weather, as we close, has to the last been wet, but the barometer on the 16th gives promise of improvement.

16th April.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR APRIL.

The frequent fluctuations in the weather since the date of our last report have had the effect of causing some of the wheats to look somewhat unpromising; still, however, our general advices in this particular are tolerably satisfactory. It would be premature to offer any observations upon the probable produce of the next harvest, yet we may intimate that our prospects in this respect are favourable. Spring corn in general is progressing well.

In some parts of the country the epidemic has again made its appearance amongst both beasts and sheep; yet, as it has been only in a modified form, the losses actually sustained by the flockmasters and others have been by no means alarming. The unusual abundance of pasture and other herbage has caused the stock to fare extremely well.

The principal corn markets have been but mode-

rately supplied with both English and foreign wheat. Fine dry qualities have commanded a steady sale, at an advance in the quotations of from 1s. to 2s. per qr.; in the middling and inferior kinds comparatively little business has been transacted, at previous currencies. The demand for all kinds of barley has fallen off; yet prices have undergone no change worthy of notice. Malt has come somewhat freely to hand; fine parcels have sold steadily, other kinds slowly, at late rates. The shipments of oats from Ireland having fallen off, the oat trade has ruled firm, at an advance in value of from 1s. to 2s. per qr. In beans and flour very little doing; but peas have sold on higher terms.

For hay and straw the inquiry has been extremely inactive the whole of the month, and prices have, in some instances, had a downward tendency. Meadow hay has produced £3 3s. to £4 8s.; clover do., £4 8s. to £6; and straw, £1 12s. to £1 16s.

per load. The stocks of both hay and straw are unusually large.

Our advices from Ireland and Scotland are to the effect that farm labours are sufficiently forward, and that the wheats are looking remarkably strong and healthy. On the whole the corn trade has ruled firm, yet we can notice no material improvement in the quotations.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Notwithstanding comparatively little progress has been made in the past month in the discussions in the House of Commons upon the proposed changes in the tariff affecting the importation of live cattle from abroad for our markets, the arrivals of both beasts and sheep from Holland and elsewhere into London and at the outports have been again extensive, though—as many of the shippers are awaiting the abolition of duties—not quite equal to those of some previous months.

The actual numbers have been as under:—

	LONDON.	OUTPORTS.
Beasts ..	707	300
Sheep ..	1201	210
Calves ..	8	—
Pigs ..	—	20
	1916	530

At least four-fifths of the above arrivals have come to hand from Rotterdam, Schiedam, and Harlingen; the remainder chiefly from Hamburg, by steam-vessels. The most novel importation has been that from Prussia, whence we received 30 oxen for the Smithfield market, held on the 27th of this month, and which, from the admirable condition in which they came to hand, and their apparently good weighing qualities, were readily disposed of at from £19 to £21 each. This is the first occasion we have had to report of any arrival from the interior of the continent; yet it fully bears out the truth of the remarks which we offered to the notice of our readers some time since, that it was highly probable stock would, in the course of time, arrive hither from that quarter during the present year—perhaps in large numerical strength. As this speculation has turned out a most profitable one—as we shall presently show—we feel convinced that the moment cattle is allowed to be landed free of duty, immense numbers will be forwarded to our markets, and thereby will be produced a depression in the general quotations of home-fed stock. It has been argued, that the moment we create a demand abroad the prices will rise there so as to prevent any very extensive exports. This, in some instances, may be true; but the great question for us to consider is to what extent can the foreigner supply us? And, further, what are the present rates current abroad? From information which has lately reached us, we feel confident in stating that the surplus numbers of both beasts and sheep—not only in Holland, but in Prussia—are, at this time, large almost beyond recollection precedent. Hence it is fair to presume that, ere long, our markets will exhibit considerably increased supplies,

without producing any material effect upon the value abroad. To illustrate the rates at which we may be readily supplied, we shall take the above importation, to which we have particularly alluded. In the first place, we find that the actual cost of the beasts in Prussia was £12 per head; the expense of droverage to the place of shipment, about 6s.; that of conveyance by steam hither, £3 10s.; the incidental outlay, such as landing, commission, &c., 8s.; and the duty, £1. To make this important point more clear, we give the annexed return, which we have obtained from an undoubted source.

	Per Head.
	£ s. d.
Cost in Prussia	12 0 0
Droverage	0 8 0
Steam boat to London .. .	3 10 0
Landing, Commission, &c. .	0 8 0
Customs duty	1 0 0
Total expense to the speculator	£17 6 0
Sold in Smithfield at an average of	£20 0 0

Balance in favour of the importer £2 14 0

That many thousand head of really good beasts can be purchased in Prussia at the above quotation, and disposed of here at a corresponding profit, we have no doubt whatever. The Dutch trade still remains in the hands of comparatively few persons, though we are aware of many parties, knowing as they do, that almost every head of beast imported for some months past has produced a profit of at least £1, are preparing to invest their capital in these speculations, and which they will do the instant the measure now before parliament is passed. The care exercised at the Custom Houses in inspecting the stock, before and after it has been landed, has prevented the introduction of diseased cattle; indeed, we have the best authority for stating that very few losses have been sustained abroad for some time past, from the effects of the so-long-complained-of epidemic. The foreign sheep which we have lately inspected have been by no means first rate animals, and we are of opinion that some time has yet to elapse ere any extensive numbers can be received fit for our cutting butchers. We may apply the same remark to the few calves which have lately come in. The difficulties which we have frequently noticed in fattening foreign stock in this country appear to have greatly deterred our graziers from purchasing the animals for that purpose; indeed, at the present time, there are not 100 beasts in this country, either pastured or in the stalls, being thus experimented upon. As we have before remarked, the change in the food and the climate are matters which cannot be overcome; hence, we would not advise our readers to invest their money in such a doubtful speculation. We understand that in most of the large distilleries in Holland, large numbers of beasts are still being fed for our markets, and which will gradually find their way hither as the same advances.

The accounts which continue to reach us from our various counties are to the effect that both beasts and sheep are thriving remarkably well. The lambing season having been an extremely good one, fewer complaints of the scarcity of stock

on some farms have come to hand than heretofore; yet it is quite evident the actual supply is not large, the time of year considered.

Up to Smithfield Cattle Market, the arrivals of beasts from our own grazing districts, arising, in a great measure, from a large portion of the turnips having at length been consumed, have been considerably on the increase, and of unusually fine quality, compared with those of the month of March, current year, and that of April 1845. The numbers of sheep have also improved, though they have fallen short of those last season, as is thus shown—

	SUPPLIES.		
	April, 1846.	March, 1846.	April, 1845.
Beasts	15,224	12,579	12,800
Cows	587	521	600
Sheep	91,620	77,010	110,400
Lambs			
Calves	905	731	600
Pigs	2351	2081	1,600

The bullock supplies for the month have been derived as under:—

Norfolk, Suffolk, &c	7,600 head.
Northern counties	500
Western and Midland districts	2,230
Other parts of England	1,150
Scotland	6,620
Ireland	200
Abroad	707

The remainder have been principally derived from the neighbourhood of the metropolis. From the Isle of Wight the number of lambs has been small—namely, 783; and this, too, notwithstanding the comparatively high rates at which lamb has been selling during the whole of the month. The importation of 80 sheep from the Cape of Good Hope, on the 16th, gave rise to the supposition that they were intended for sale in the above market. Such, however, has not been the case, the sheep having been purchased for breeding purposes. From Scotland, about 1,800 excellent sheep have

reached us, and which have mostly sold at fair prices.

As might be expected from the increase, both in the number and weight of the animals exhibited since our last review, and which exactly bears out the truth of the observations which we have from time to time offered on the subject, a slight falling off has been observed in the general demand, and quotations have had a downward tendency; those of beef having declined 2d., of mutton 6d., of inferior lamb 4d., of veal 4d., and of pork 2d. per 8lbs. So far as our experience carries us, we have no hesitation in saying that the prices of mutton will recede considerably before the end of July.

Up to Newgate and Leadenhall, the arrivals of slaughtered meat from Scotland and various parts of England have been moderately extensive, and of improved quality. Generally speaking, the demand has ruled inactive, on the following terms:—

Per 8lbs. by the carcass.			
Beef	2 4	to	3 6
Mutton . .	3 4		4 6
Lamb	5 4		6 8
Veal	4 4		5 4
Pork	3 4		5 2

In addition to the arrivals given in the annexed statement, about 1,000 carcasses of lambs, together with 300 do. of foreign carcasses and sheep, have been disposed of at fair currencies.

ARRIVAL OF CARCASSES DURING THE MONTH.

	Beasts.	Sheep.	Calves.	Pigs.
Scotland	210	2420	—	2160
Yorkshire	255	2450	—	2650
Lincolnshire	350	770	—	620
Norfolk	270	450	—	480
Suffolk	200	490	—	550
Cambridgeshire	270	610	—	620
Essex	110	390	370	900
Surrey	200	930	710	1300
Devonshire	10	40	—	340
Wiltshire	240	580	410	630
Other parts	580	1000	700	1000
Total	2695	11130	2190	12250

REVIEW OF THE CORN TRADE

DURING THE MONTH OF APRIL.

No further progress has been made with the corn importation bill through the House, the third reading having been repeatedly adjourned. This delay has been caused by ministers themselves, in consequence of a determination to push the Irish coercion bill forward a stage, before proceeding with their commercial policy.

We cannot view this course of proceeding on the part of the Government in a favourable light, as there can be no question that whichever way the matter may be ultimately disposed of, a final settlement would be infinitely better than protracted uncertainty.

Doubt on a point of such importance as that regarding the laws which are in future to regulate duties on corn, must prove injurious to the community at large.

The landowner, the farmer, and the merchant, are alike at a loss how to act; and business in all its ramifications is perfectly paralyzed. We have repeatedly given it as our opinion, that the bill of 1842 worked well, and that no real reason for its repeal existed; but her Majesty's advisers having once determined to make an alteration, we think the interest of the country demanded that the mat-

ter should have been proceeded with before anything else was attempted.

Some of our readers may perhaps differ with us in this view, but we think it must be allowed that to temporize and procrastinate will be of very little avail, as the ultimate fate of the measure must now rest with the lords, who are not very likely to come to a different decision in the month of June or July to that which they might have arrived at in March or April.

Meanwhile there is no knowing whether foreign wheat will hereafter have to pay 16s., 17s., or only 4s. per qr. duty—a position of affairs calculated to prevent operations in anticipation; all parties, whether sellers or buyers, being anxious to know the result before entering into anything like extensive operations. Under these circumstances the transactions of the month have been merely from hand to mouth, and but little fluctuation has occurred in the value of wheat. The present state of affairs renders it impossible to foresee the probable range of prices; for, independent of the difficulties which in ordinary times must always attend this consideration, when little or nothing can be really known relative to the productiveness of the next harvest, political affairs may still have great weight one way or the other. With respect to the growing crop of wheat, the reports from different parts of the country have become less favourable this than they were the preceding month, the generally cold and extremely wet weather experienced during several weeks having detracted from the previously promising appearance of the plant. On heavy clay soils and all imperfectly drained lands, the colour of the blade has certainly changed for the worse; but we are inclined to think that no mischief has hitherto been done which an interval of warm dry weather might not remedy.

The breadth of land under wheat is not, we believe, so great as last year, which would render any acreable deficiency of more importance than usual; and as the stocks in farmers' hands are far less than they were at the corresponding period of 1845, whilst millers hold comparatively nothing, the progress of the outstanding crop is likely to be watched with more than ordinary interest throughout the season. At present it would be folly to venture on predictions, but as the summer advances we shall not neglect to collect the best information from all parts of the kingdom respecting the aspect of the crop, and hope thereby to be enabled in some degree to guide our opinion as to the probable produce.

Notwithstanding the uneasiness created by the proposed alteration in the corn laws, the farmers have manifested no particular anxiety to realize, and the deliveries from the growers have been very

far from liberal. Considering the effect likely to have been produced on the minds of the agricultural body by the prospect of so great a reduction in the duties as that contemplated by the premier's new bill, it may be reasonably inferred that holders of wheat cannot feel much disposed to meet the new state of things with large stocks; we therefore arrive at the conclusion that the yield of 1845 was really deficient, and that the growers have already disposed of the bulk of their wheat.

There has, nevertheless, up to this time been no appearance of the scarcity and want so generally predicted in the winter by the supporters of the Anti-Corn-Law League, and there are now about a million and a half of quarters of wheat in bond in Great Britain. This large quantity would long ere this have found its way into consumption, if affairs had been allowed to go on in the regular way; whereas the prospect of ultimately being enabled to liberate the same at 4s. per qr. has induced importers to hold back: the outcry about scarcity in England must therefore be viewed as an invention of the free-traders, as wicked as it was false. The evil effects of ministers having countenanced these misrepresentations have lately begun to develop themselves in Ireland. The constant predictions of famine have at length caused the evil the parties professed to dread. It cannot be questioned that the stocks of grain in the Sister Isle are at the present moment considerable (perhaps not much less than usual at the corresponding period of the year); but the bulk of the corn is held by parties able to wait the expected scarcity and high prices; and by the regular supplies having been withheld, together with the partial failure of the potato crop, the poor have been plunged into the utmost misery. In several parts of the island the people have been driven, by want, to attack the mills and flour stores; and it is greatly to be feared that the riots will not be altogether put down without blood being shed. If ministers are really anxious to relieve the starving poor in Ireland, they have certainly gone a curious way to work to gain their end. Up to the present time little more has been done than lamenting the evils under which that country labours. If it were deemed necessary to import foreign grown grain, a short bill might have been passed months ago, which would have met with the support of all parties in Parliament, to open the Irish ports for a limited time, so as to meet a temporary evil by a temporary remedy. This, however, would not have suited the enemies to protection: because the potatoes failed in Ireland, the whole system of laws relative to corn, introduced only a few years ago as a final settlement, is to be repealed.

As already remarked, little can be said in the

existing state of uncertainty regarding the probable future range of prices, and the want of animation which has characterised the trade of late does not afford much scope for comment in respect to the transactions of the month; our review can therefore scarcely be expected to prove of much interest, and we shall confine our observations principally to what has taken place in the metropolitan market, as the transactions there will be found to afford a fair type of the proceeding in other parts of the kingdom.

The arrivals of wheat of home growth into the port of London have on the whole been moderate, and the greater proportion of what has been received has been from Lincolnshire, Cambridgeshire, and Norfolk. Most of this wheat has gone direct to the millers, who have purchased it free on board at the different shipping ports on the east coast. The business actually done at Mark-lane has therefore been very circumscribed. The scanty nature of the supply from the home counties (comparatively little having been received from Kent, Essex, or Suffolk), and the superiority of the quality of the samples as compared with the growth of the counties first named, have, however, caused the millers to take off what has been brought forward regularly as it has come to hand, and on the whole prices have rather tended upwards, more particularly for the finer kinds of white wheat. The total rise since the commencement of the month may be estimated at about 2s. per qr.

The indifferent condition in which the great bulk of the last crop was harvested, and the absence of frost during the past winter, have, up to the present period, rendered a mixture of old with the new wheat absolutely necessary to manufacture good flour; and supplies of English old having long since ceased to come to market, the finer descriptions of foreign have been in request for the purpose named. So long as the stocks of free held out, very little was taken out of bond; the better kinds having, however, become exhausted, and what remains in granary being wholly unfit for the purpose required, it has been necessary of late to release small quantities from under the queen's locks. This has been chiefly done by certificates granted under the provisions of the grinding bill, by which it will be recollected it was enacted that for a given quantity of flour or bread exported or placed under lock, a proportionable quantity of wheat might be entered for home consumption. Until the want of old foreign wheat became urgent, certificates were procurable at prices equivalent to 12s. per qr.; but as the demand for them increased, they soon rose in value, and within the last week or two 16s. per qr. has been freely paid for them.

Beyond what has been taken by the millers to

supply their immediate wants, there has been very little doing in bonded wheat; the disposition to make speculative investments seems to have wholly subsided; and, as the arrivals from abroad have been liberal, previous quotations have not been supported. At the close of March good Lower Baltic red wheat was worth about 50s. per qr. in bond, and fine Danzig 56s.; lately the former kind has been sold at 48s., and, in one instance, a cargo from Griefswald of good quality, but not in first-rate condition, was parted with at 46s. per qr. The recent sales must have been at a serious loss to the importers; the cost, free on board on the other side, having been almost as high as the prices obtained here, leaving nothing to cover the expenses of freight, insurance, &c. From the commencement of January up to the close of April, 33,000 qrs. of wheat have been liberated out of bond. At the port of London by certificates, and at Liverpool, Bristol, &c., entries have been made through the same means; but as flour has been substituted for the wheat released, the quantity of bread-stuff under lock has not been diminished. It is evident that the supply of certificates will not much longer keep pace with the demand, and that millers will be compelled to pay the duty. The probable range of the averages has, therefore, become a matter of some interest. These have lately been gradually creeping up, and the duty, after having remained stationary for several weeks, fell from 18s. to 17s. per qr. on the 16th inst., with the prospect of its receding another step in the course of next month. A considerable proportion of the wheat lately received is from the Mediterranean, of a quality not well suited for this market. A few cargoes have, therefore, been re-shipped to Bristol, and one or two to Ireland: there was, nevertheless, on the 5th inst. no less than 481,491 qrs. in bond in the port of London, and 1,227,374 qrs. in the kingdom altogether.

The flour trade has, throughout the month, been dull, and prices of the article have, notwithstanding the rise in wheat, remained nearly stationary. The millers complain that they are scarcely paid for grinding; but competition among themselves has hitherto induced them to continue to sell at the old prices. Flour in bond has fallen in value since our last; and United States, which was then worth 28s., has lately been sold at 26s. per brl. The stock under lock in the kingdom consisted on the 5th April of 940,871 cwts., of which 128,696 cwts. were in London. There is, we believe, some quantity of flour now on passage from the United States, most of which was bought at comparatively high prices, and will probably have to be sold at a loss upon arrival.

The supply of home-grown barley into London

has been small, nor have the arrivals of this grain from abroad been of much consequence. During the interval of rather warm weather experienced in the early part of the month, the demand from the maltsters slackened, and in some instances a decline of 1s. per qr. from the extreme rates of March was submitted to. Lately the inquiry has again improved, and the top quotation for malting samples is now much the same as it was at the close of last month, viz., 36s. to 37s. per qr. Distilling and grinding qualities have, throughout the month, been in moderate request, and have maintained their former value. It is not improbable that low descriptions of barley may hereafter meet with increased attention for feeding; the price of the article, taking weight into consideration, being relatively cheaper than oats. The stock in bond is by no means large, there being only 18,041 qrs. in London, and 88,002 qrs. in the kingdom; nor is it likely that any quantity of importance will be received from abroad, this grain being scarce and dear at most of the continental ports. The transactions in malt have been on a very restricted scale; sellers have, nevertheless, displayed considerable firmness; and though the ordinary kinds have, in partial instances, been sold a trifle below former rates, the old brewers have been compelled to pay full terms for choice samples of Ware, and other favourite sorts.

The subject of a repeal of the malt tax has recently engaged a good deal of attention. This is a measure well deserving the most strenuous support of the farmer, as a modification or a total abolition of the excise duty would cause an immense increase in the consumption of barley. An association has been formed, with a view of obtaining a total repeal, under the patronage of some of the first agriculturists; which, we trust, will meet with all the support it so eminently deserves.

Though the last crop of oats was generally (and we believe correctly) estimated at rather over an average at the time of harvest, the article has lately become decidedly scarce. This has no doubt been caused by the great falling off in the supplies from Ireland. What the stocks in that country may at present be it is not easy to determine; but in England and Scotland farmers certainly do not hold much more than they will require for their own consumption.

The failure of the potato crop in Ireland has, probably, caused oatmeal to be more extensively used than in ordinary years; still we are inclined to think there must be a large stock remaining on the other side of the Channel. High, however, as prices now are in the English and Scotch markets, the rates demanded at the principal Irish shipping ports are relatively higher; any immediate increase in the supplies from thence cannot, therefore, be reckoned on. To show how great has been the deficiency in the arrivals into London, it is merely necessary to state that, against 321,102 qrs. received during the six months ending 28th March last, 419,829 qrs. came to hand from Ireland in the corresponding time of 1845. For some weeks past the weekly receipts have been inadequate to meet the consumption; and the stocks in the hands of the dealers have, therefore, been reduced to a

very low ebb. Prices have, under these circumstances, gradually crept up, and quotations are at present about 2s. per qr. higher than they were at the close of March. Whether the upward tendency is to continue will depend on the arrivals from Ireland, at least until the month of June. About that time or a little later we shall probably have rather large arrivals from the continent; orders in anticipation of high prices having lately been sent out. The quantity in bond is only moderate; it consisted on the 5th inst., the latest date to which the official return is made up, of 109,120 qrs. in the kingdom, of which 71,515 qrs. were in London.

Of English beans the arrivals have been small; the demand, however, has likewise been restricted; and the supplies brought forward have proved fully equal to satisfy the wants of buyers. In point of price very little variation has occurred; the trifling change which has taken place has, however, been in favour of the purchaser. Several rather large cargoes of Alexandrian beans have lately come to hand; and a further quantity is still on passage from the same quarter.

White boiling peas have met with very little attention, and their value has scarcely varied. Grey and maple have been taken pretty freely for shipment to Scotland, and have brought enhanced terms, as much as 34s. to 35s. per qr. having been realized for fine parcels. Of peas there were under lock on the 5th April 14,067 qrs. in the kingdom, and 6,427 qrs. in London.

The delay in the passing of the new Corn Importation Bill, and the consequent stagnation in business in grain in the British markets, have not been without influence on the value of wheat on the Continent; and by the latest advices from the Baltic it appears that holders had become more reasonable in their pretensions. The foreign merchants have long ere this discovered that the famine outcry raised in this country some months ago, to serve party purposes, was a gross exaggeration. So long as they had reason to expect that Great Britain was likely to need assistance, wheat was held at extravagant prices abroad; but since they have become convinced that we shall require comparatively little aid, they have shown more disposition to let us have what we may want on more reasonable terms. Within the last few weeks prices of wheat have tended downwards at all the leading continental ports. Letters from Danzig, of the 21st instant, state that though the supplies from the interior had been moderate, previous prices had not been supported, fair high-mixed qualities having been in vain offered at 47s. to 48s. per qr. free on board. Parcels in granary had been held relatively high, but it occurs to us that if the British demand should not improve, sellers on the other side will have to come down in their demands considerably. Up to the present time very little wheat has been shipped from Danzig, scarcely half-a-dozen cargoes having been despatched from thence to English ports since the opening of the navigation.

From the Lower Baltic ports the accounts are also dull; quotations are nevertheless much too high in that quarter to render it likely that orders to any extent will be sent out by our merchants,

similar qualities of wheat to those shipped from the respective ports being actually cheaper in London and Liverpool than at Rostock, Stettin, &c. At the places last-named, good heavy samples were, according to the latest advices, still held at 46s. to 47s. per qr. free on board; but it was expected that when farmers had finished spring sowing (with which they were then busily occupied), and larger supplies were brought forward, prices would give way, provided the export demand did not in the interval increase.

At Hamburg red wheat has lately been sold cheaper than at any other continental port, very good Waren, weighing 62 lbs. per bushel, having been parted with at a price rendering the cost, free on board, little over 45s. per qr. Even this leaves no margin for profit, if destined for the London market; and until the value of the article recedes further on the other side by rises on this, the importations cannot be very large.

From the United States the accounts reach up to the beginning of April: the export demand for flour had then become somewhat dull, and at New York good Genessee was offering at 5½ dollars, being about equal to 23s. 6d. per barrel. Rather large shipments appear to have been made, and some quantity must now be on passage to this country, mostly bought too high to yield a profit to importers.

CURRENCY PER IMPERIAL MEASURE.

APRIL 27.			
WHEAT, Essex and Kent, new, red	54 58 63	White.	60 66 70
Old, red	62 66	Do.	64 60 70
RYE, old	34 38	New	58 40
BARLEY, Grinding, 28 31 Maltng	34 35	Chevalier	36 —
Irish	27 28	Bere	26 27
MALT, Suffolk and Norfolk	58 63	Brown	56 60
Kingston and Ware	60 —	Chevalier	65 —
OATS, Yorksh. & Lincolnshire, feed	24 27	Pofato.	26 28
Youghall and Cork, black	23 24	Cork, white	24 25
Dublin	24 25	Westport	26 27
Waterford, white	21 23	Black	23 24
Newry	27 30		
Galway	20 21 22		
BEANS, Tick, new	34 38	Old, small	48 50
PEAS, Grey	36 —	Maple	30 —
White	38 44	Boilers	42 44
LOUR, Town-made	46 53	Suffolk	42 — per sk. of 280lbs.
Stockton and Norfolk	40 41	Irish	44 46

Account shewing the Quantities of Corn, Pulse, and Flour imported into the United Kingdom, in the month ended the 5th April, 1846; the Quantities upon which Duties have been paid for Home Consumption during the same month, and the Quantities remaining in Warehouse at the close thereof.

Species of Grain.	Quantity imported.	Quantity entered for consumption.	Quantity remaining in warehouse.
	qrs. bush.	qrs. bush.	qrs. bush.
Wheat, from British Possessions	619 4	3341 5	2872 0
Barley, do.	—	—	—
Oats, do.	—	—	—
Peas, from do.	—	—	—
Wheat, foreign	116381 5	881 6	1224502 7
Barley, do.	6207 6	34 3	88002 0
Oats, do.	12962 3	447 2	109120 3
Rye	—	—	163 7
Peas, do.	7077 3	370 2	12182 1
Beans, do.	17344 7	890 5	29003 7
Indian Corn, do.	38016 0	46996 4	38498 4
Buck Wheat, do.	89 0	200 3	207 1
	cwts. qrs. lbs.	cwts. qrs. lbs.	cwts. qrs. lbs.
Flour from British Possessions	5516 2 9	27600 2 7	43258 1 10
Flour, foreign	121409 3 2	1325 0 17	897613 1 14

STOCK OF GRAIN IN BOND IN LONDON APRIL 5.

Wheat.	Barley.	Oats.	Beans.	Peas.	Maize.	Flour.
qrs.	qrs.	qrs.	qrs.	qrs.	qrs.	cwts.
481,491	18,041	71,315	9,914	6,427	6,654	128,666

IMPERIAL AVERAGES.

Week ending	Wheat.	Barley.	Oats.	Rye.	Beans.	Peas.
March 14th	51 3	29 4	21 9	34 2	35 2	34 9
21st	55 1	29 10	22 0	33 10	34 4	35 4
28th	55 5	30 2	22 1	34 0	35 0	33 3
April 4th	55 0	30 7	22 6	33 7	34 10	34 2
11th	53 0	30 9	22 9	33 4	34 1	33 8
18th	55 10	33 5	22 9	35 5	35 9	34 5
Aggregate average of the six weeks which regulates the duty.	55 5	30 2	22 4	34 1	34 10	33 11
Duties payable in London till Wednesday next inclusive, and at the Out-ports till the arrival of the mail of that day from London	17 0	8 0	6 0	8 6	8 6	9 6
Do. on grain from British possessions out of Europe	4 0	1 0	1 6	0 6	0 6	1 0

PRICES OF SEEDS.

APRIL 27.	
SEED, Rape	24l. 20s. Irish s. —l. —l. per last.
Do, new	25. —l. per last.
Linsced, Baltic	49 41 Odessa 45 47
LINSEED, Baltic and Russia,	38 10, finer sorts, 43 45 per qr
Mustard, white	10 12 brown — per bush.
Linsced Cakes, English	—10l. 10s. to 11l. 0s. per 1000
Linsced, English, sowing	54 60 crushing 45 47 per qr
Carraway	44 46 new 48 50 per cwt.
Coriander	10 13 per cwt.
Mustard, brown, new	10 12 white. 9 11 p. bush
Hempseed	35 38 per qr.
Trefoil	17 24 old. — new 28
Medicor. & Odessa	41 45
Canary	48 49 per qr. fine 51 53s.

PRICES OF HOPS.

BOROUGH, MONDAY, April 27.
The hop market has been so dull since last October, and the sales have been so limited, that, as we have frequently remarked under this head, it has at times been difficult to give prices. At present the rates are from 25s. to 30s. under those of that month, but at this reduction there seems now to be something like a firm market. The principal portion of good or coloured hops have been sold, and there is a good demand for them, the quantity left being of low quality and a colour. Sussex pockets are now 100s. to 120s.; and Wealds, 105s. to 120s. per cwt.

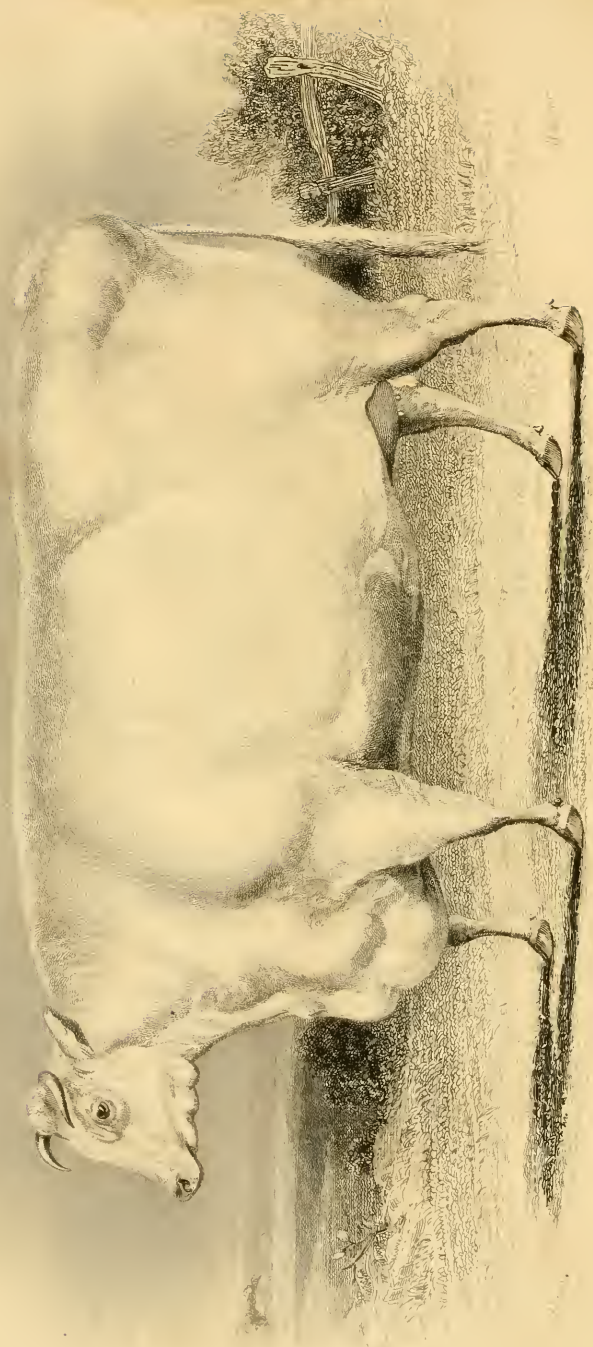
POTATO MARKET.

SOUTHWARD, WATERSIDE, April 27.
There being a continued supply of Mangold Wurzel and White Carrots, at unprecedentedly low prices, the cowkeepers can do without potatoes; if they take them, it is at their own prices.

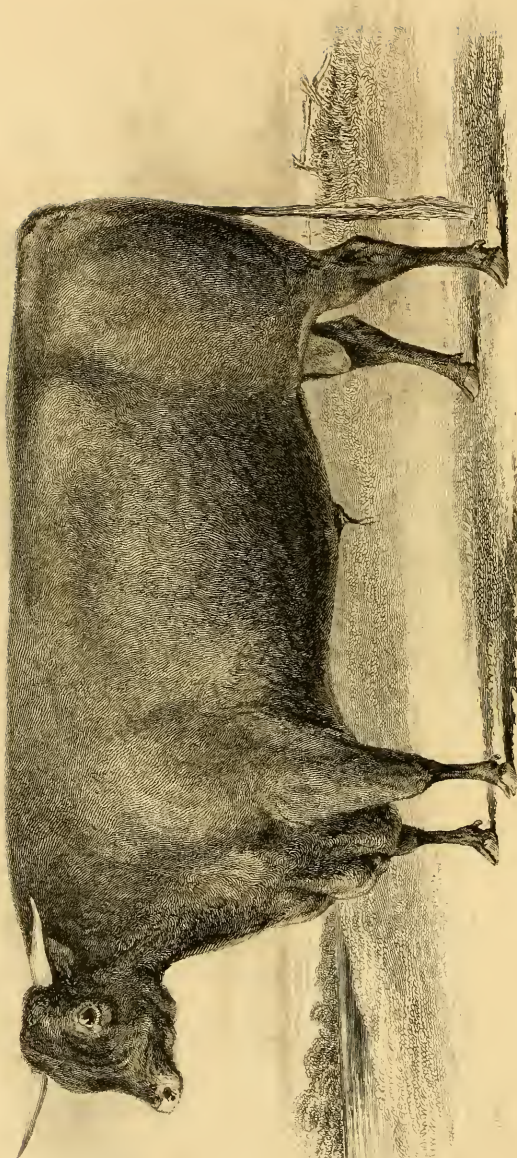
PRICES.—York reds, 100s. to 140s.; do. Regents, 50s. to 90s.; do. Shaws, 20s. to 60s.; Scotch reds, 85s. to 100s.; Montrose Buffs and Blacks, 75s. to 80s.; Fraserburgh Blacks, Buffs, Blues, and Mixtures, 60s. to 70s.

NOTICE TO CORRESPONDENTS.

“A WEST COUNTRY FARMER,” will find his first query fully answered in the present number. With regard to the second, a portrait of the Duke of Northumberland bull appeared in the *Farmer's Magazine* for September, 1839; and one of Hecatomb a year or so earlier. They can only be procured in copies of the magazine.



Handwritten text, likely a description or notes related to the cow, written in cursive script.



Water Buffalo
The water buffalo is a large, powerful animal, and is used for many purposes, such as plowing, carrying loads, and as a source of milk. It is found in many parts of Asia and Africa.

THE FARMER'S MAGAZINE.

JUNE, 1846.

No. 6.—VOL. XIII.]

[SECOND SERIES.

PLATE I.

SHORT-HORN HEIFER.

Snowdrop, three years and ten months old ; bred by the Right Hon. Lord Sherborne, of Sherborne, near Northleach, Gloucester, by Harold, d. (Rachael, bred by Mr. J. Booth, of Cotham, near Newark), by Cedric (3311), g. d. by Nimrod (4571), gr. g. d. by a grandson of Blyth Comet (85), gr. gr. g. d. by Crispin (174), gr. gr. gr. g. d. by Meteor (431), gr. gr. gr. gr. g. d. by Meteor (431). Harold by Waverley (5613), d. (Juno) by Favourite (1028), g. d. by a son of Blaize (76), gr. g. d. by Cœlebs (897), gr. gr. g. d. by Neswick (1266), gr. gr. gr. g. d. by Mr. Fisher's Old Red Bull (3799). Snowdrop was fed and exhibited by Mr. W. Trinder, of Wantage, Berks, at the Smithfield Club Cattle Show, in December, 1845, where she obtained the first prize of Twenty Sovereigns, and Silver Medal for the best heifer under five years old ; also the Gold Medal as the best animal in the sixth, seventh, and eighth classes.

PLATE II.

A DEVON BULL.

This animal, two years and five months old, was bred by Mr. James Quartly, of Molland, near South Molton, Devon ; was exhibited by him at the country meeting of the Royal Agricultural Society, at Shrewsbury, in July last, and obtained a prize of Twenty Sovereigns.

THE OAK AND THE ASH.

Both these trees have been noticed in previous numbers, so far as refers to their culture and uses ; I recur to them again in order solely to call the attention of the curious to a meteorological phenomenon of great interest at this particular time.

Allusion has formerly been made, in more than one periodical, to the unpromising prognostic of the late vernal equinox, when (as in 1845) at almost the precise point of time when the sun entered the spring signs, the atmosphere changed from brilliancy to clouds and gloom, and the weather be-

came entirely unsettled, with a tendency to rain, so frequent as to challenge comparison. Whatever may be said or thought of the equinoctial prognostic, no one, who has carefully observed it, can reasonably doubt that such as the weather actually is at, or within two or three days of the sun's transit of the equinoctial line, so it will remain, on the whole, throughout the summer or winter following. But exceptions there are, as in all other conditions ; and now, without farther preface, I shall come at once to the subject of the present article.

In 1844 a correspondent in a Cambridge paper adverted to the long-noticed fact—that in any year when the oak expanded its buds and became clothed with leaves, while those of the ash remained entirely or comparatively dormant, the succeeding summer would be early and warm, congenial to husbandry and farm crops.

There are few agriculturists—especially those upon grazing farms—who do not feelingly recollect the premature aridity of that spring, by which grass and fodder crops were rendered almost unproductive; and as the summer retained the same character (no rain having fallen till the end of June), many persons were constrained to feed their cattle upon the green boughs of trees.

I had no faith in the prognostic abstractedly; yet as the facts of that year could not be controverted, I noticed them in the *Farmers' Magazine*. The exact resemblance of the two last vernal equinoxes led me to converse upon these subjects with many persons; and about three weeks since, one who resides in the west of England, and who heard me express some fears upon the too probable condition of the summer, recurred to the state of the oak and the ash, saying, that during more than 20 years a dry warm summer had always followed the early expansion of the oak-leaves. At the present time (and in fact from the middle of April), the difference is almost striking. Both trees vary in a trifling degree, and some oaks are naturally later than others; but in general they are now fully three weeks, if not more, in advance of the ashes. The former began to expand their buds before the middle of April, and were quite verdant at the close of the month; but the ashes were black, as in winter, at the beginning of May, and even now (May 14th) are very partially excited.

Whatever can by any means be construed into even an appearance of blind superstitious prognostic ought to be impugned at once—it should be met by every sound argument that philosophy can bring to bear against it: but the phenomena attached to the oak and ash have nothing in common with superstition, they cannot be referred to it. No one, it would seem, has taken a philosophic view of the subject; therefore it appears indispensable to pay some attention to certain facts which are equally curious and undeniable—they are the following: On some occasions the *oak*, as in the present spring, becomes far in advance of the ash; and then, they who think that they have correctly noticed results, assert that the following spring and summer will, in almost every instance, be dry. At other times the *ash* takes the precedence, and the oak is tardy; and then the prognostic is said to indicate a wet and unpropitious summer. Finally, both trees

come into leaf almost simultaneously, and then the following summer will be doubtful, and subject to alternations of rainy and dry weather. If such things are, or if experience and carefully registered data appear to confirm them, it behoves us to inquire into the natural agency which can induce phenomena so extraordinary. The science of electro-magnetism becomes every day more important; and that which was treated lightly, and with indifference only a few years ago, is now admitted to be the interpreter of nature's obscure secrets.

A remarkable article appears in the last-published number of the *Edinburgh Journal of Agriculture*, headed "The *Electro-culture* of the farm," written by Mr. Sturgeon, now Lecturer at the Manchester Institute, &c., &c., &c. It is safer to appeal to authority so high, than to confide in any oral testimony, however great and sincere the zeal of the party; and therefore I extract the following lines. The author premises that this active element of nature, called *electricity*, is so universally diffused throughout every part of the terrestrial creation, that it occupies every part of the earth's surface, and of the shell of air which surmounts it. He adds—"This leads to the inference that all the various objects which clothe the surface of the earth, such as trees, shrubs, plants, flowers, and crops of every kind, partake of this electric distribution, and that each individual object is possessed of more or less of this extraordinary element, or in electrical language, that each is possessed of its *natural share*. It must not be understood, however, that this natural distribution confers upon different objects an *equal share*, either in proportion to their magnitude, weight, or shape; but on the contrary, that each object contains a share peculiar to itself, according to its degree of susceptibility of receiving the fluid, or as some writers say, 'according to its capacity.'"

I stop here merely to remark that although the free avowal of these doctrines proves a great advance in the science of electricity, and in the boldness of its professors, it by no means interprets the theory itself, or explains the cause of those changes of condition from *plus* to *minus*, from *positive* to *negative*, which are here implied in the terms "susceptibility or capacity." As the *sun* is the *fountain* of the two modifications of elementary fluid, which we conventionally term "electricity" and "magnetism," would it not appear more reasonable, as well as consonant with admitted phenomena to presume the existence of two or more fluids (solar elements) which act interchangeably, as disposed by the agency of the dominant orb of day?

But this is not an electrical essay, neither do I conceive that our imperfect instruments are prepared to elucidate the causes of meteoric disturbances;

therefore I return to the observations of Mr. Sturgeon, at p. 271 of the magazine, so far as they apply to the subject in hand :

“The various objects which constitute the vegetable clothing of the land are never in precisely the same electric condition, being continually *positive* and *negative* with regard to each other. An *oak* and an *ash tree*, for instance, though both in their ordinary or normal-electric states, are not endowed with the same degree of electric force, one being *positive* to the other, and, consequently, the latter *negative* to the former. A similar inequality of electric force occurs amongst other growing plants, and their manures, and even amongst the various elements which constitute the latter, no two of them being precisely alike at the same time.”

I have advocated during several years the theory of manuring upon the principle of electric disturbance, and may now unhesitatingly re-assert that there do not exist two or more atoms throughout the entire range of nature which tend to, or do actually unite, otherwise than as they are actuated, that is *attracted*, by the peculiar electric condition of both. If we restrict our ideas to the presumption that in one atom the fluid superabounds (*plus* or *positive*), while in the other it is either absent or defective (*minus* or *negative*), then in supposing that the air is generally positive to the earth, and therefore the earth negative to the air, we would ask, what can—*on the instant*—be the *cause* which shall induce a contrary state, and invert the agency of both? Let us, however, refer exclusively to the sun as the primary agent, and to water as the grand medium of operation; then, little as *we know*, and imperfect as may be our perception of the glorious *machinery*, we still have hold of that *great principle* which, while it satisfies the mind of the all-sufficiency of natural causes, fails not to urge it on to patient investigation.

Mr. Sturgeon mentions the ever opposed conditions of the oak and the ash; he therefore furnishes a popular clue whereby to pursue the subject now under inquiry. Therefore as the oaks are singularly in advance of the ash trees, no period can be more opportune than the present to bring the truth or the futility of the opinion at once to the test; because, not only has the weather subsequent to the vernal equinox been rainy beyond example, but it continues fickle and unsettled.

If the electric, or electro-magnetic condition of the oak, under solar influence, be always opposed to that of the ash, and if we possess, or can obtain, ex-

perimental proof that, under such a condition as the present, a fine maturing season is guaranteed to us, then we obtain an index truly natural and philosophical, pointing to the future, enabling the husbandman to form some rational conjecture of what he has a right to expect, and to adopt precautionary measures.

Mr. Sturgeon appeals to an authority which was once in high repute, and ought never to have been lost sight of—that of Father Beccaria, Professor of Natural Philosophy in the university of Turin, whose experiments were carried on from 1756 till 1775. He wrote a treatise on *atmospheric electricity*, and among others Mr. Sturgeon cites the following passages :

“The electricity which obtains in clouds and rain, when carried to a certain degree, serves to promote, with regard to vegetation, the effects of common heat. It even seems that electricity successively supplies common heat itself with that moisture, by the help of which it actuates and animates vegetation, which, if heat acted alone, would be inevitably stopped. In fact, it is the electric fire that gathers the vapours together, forms clouds with them, and afterwards dissolves them into rain. It is the same fire, therefore, that supplies the earth with the nutritive moisture which is necessary to plants; and this moisture by melting the terrestrial saline particles it meets with, by diffusing them along with itself into the inmost pores of plants, causes them to grow and vegetate with such admirable and incomprehensible regularity.”

The foregoing passages allude to the moist growth-producing condition of the atmosphere, coincident with a showery season, such an one as the present, and which, therefore, ought to test the validity of the prognostic. The opposite is that condition wherein the atmosphere being positive, and its particles in a state of repulsion, the air is dry and serene, the weather warm, sunny and highly favourable to the maturation of grain and fruits.

From all that has been said, we perceive more reason to dread the realization of the equinoctial prognostic, than to rely with hope upon that offered by the early advance of the oaks.

After the profuse and fertilizing rains which have fallen, and still continue, a warm and bright summer would be a consummation of the greatest national importance.

J. TOWERS.

18th May.

ON THE ANALYSIS OF THE HOP, AND THE NATURE OF THE MANURES BENEFICIAL TO ITS GROWTH.

BY J. C. NESBIT, F.G.S.; M.C.S.L., &c.; OF THE AGRICULTURAL AND SCIENTIFIC SCHOOL, KENNINGTON, NEAR LONDON.

The cultivation of the hop being one of the most important items in farming, in the counties of Kent, Sussex, Surrey, Hampshire, and Worcestershire, and requiring at the same time a greater capital per acre than any other crop, it seems a matter of some surprise that no one has hitherto engaged in the analysis of the ashes of this plant, in order to discover the quality and weight of the mineral ingredients removed from the soil by the hop.

It is well known to all hop farmers that hops require more manure for their proper development, than any other plant which they cultivate.

Being anxious to render the cultivation of this plant less expensive, I undertook the analysis of the produce of four hills of the Golding hop, kindly furnished me by John Paine, Esq., of Farnham.

These hops were picked in September, 1845, and together with the leaves and bine, were sent to me in the latter end of that month; the hops of the four hills, dried, weighed 2 lbs.; the dried leaves, 9½ oz.; and the dried bine, 1 lb. 2½ oz.

1.—Analysis of the Ashes of the Hop.

The 2 lbs. of hops, when dried at a steam heat, lost 3 oz. of moisture, and left 1 lb. 13 oz. of dry hops.

The dry hops were burned to ashes in a large earthen crucible, and furnished 1,282 grs. of ashes, being at the rate of 9½ per cent. These ashes were analyzed in the usual manner, and every hundred parts contained as follows:—

I.—Ashes of the Hop.

Silica (or pure sand)	20·95
Chloride of sodium (common salt)	7·05
Chloride of potassium	1·63
Potash	24·50
Lime	15·56
Magnesia	5·63
Sulphuric Acid (oil of vitriol)	5·27
Phosphoric acid	9·54
Phosphate of iron	7·26
Carbonic acid	2·61
	100·00

2.—Analysis of the Ashes of the Leaves of the Hop plant.

The 9½ oz. of leaves, dried at a steam heat, lost

1½ oz. of moisture, and left 8¼ oz. of dried leaves. The dried leaves, burned to ashes as before, gave 572 grs., being at the rate of 16½ per cent.

The ashes were of the following composition in the hundred parts:—

Ashes of the Leaves of the Hop plant.

Silica	10·14
Chloride of sodium (common salt)	7·92
Soda	0·32
Potash	12·48
Lime	41·46
Magnesia	1·99
Sulphuric acid	4·20
Phosphoric acid	2·02
Phosphate of iron	2·93
Carbonic acid	16·54
	100·00

3.—Analysis of the Ashes of the Hop Bine, or Stalk.

The 1 lb. 2½ oz. of the bine, dried at a steam heat, lost 1½ oz. of moisture, and left 1 lb. 0¼ oz. of dry bine.

The dried bine burned gave 353 grs. of ashes, being at the rate of nearly 5 per cent.

The ashes gave the following result in the hundred parts.

Ashes of the Bine of the Hop.

Silica	4·64
Chloride of sodium (common salt)	4·95
Chloride of potassium	7·38
Potash	18·62
Lime	29·59
Magnesia	3·15
Sulphuric acid	2·63
Phosphoric acid	5·22
Phosphate of iron	0·31
Carbonic acid	23·51
	100·00

4.—Composition and per centage of the ashes separated from the carbonic acid.

The carbonic acid, combined with the lime, &c., in the ashes, was produced during the burning of the plant, by the oxydation of the carbon of the vegetable matter.

It is therefore not a mineral ingredient of the soil, and in order to arrive at the real per centage of inorganic matter, it is necessary to withdraw the carbonic acid from the foregoing tables. This we have done in the following tables.

Table 1.—Quantity per cent. of mineral ingredients in the Hop, Leaves of Hops, and Bine, dried at the temperature of boiling water.

	Hop.	Leaves.	Bine.
Per cent.	9·87	13·6	3·74

Table 2.—Composition in one hundred parts of the inorganic matter.

	Hop.	Leaves.	Bine.
Silica	21·50	12·14	6·07
Chloride of sodium	7·24	9·49	6·47
Chloride of potassium	1·67	—	9·64
Soda	—	0·39	—
Potash	25·18	14·95	24·35
Lime	15·98	49·67	38·73
Magnesia	5·77	2·39	4·10
Sulphuric acid	5·41	5·04	3·44
Phosphoric acid	9·80	2·42	6·80
Phosphate of iron	7·45	3·15	0·40
	100·00	100·00	100·00

5.—Quantity of inorganic matter taken from the land by four hills of Farnham Hops.

In order to obtain practical benefit from the foregoing analysis, it will be necessary, in the next place, to ascertain the whole amount of inorganic matter removed by the four hills of hops, and likewise the amounts of the separate ingredients.

The following table gives us the actual weight in *grains Troy*, of the various ingredients removed from the soil by four hills of hops.

Actual weight of Mineral ingredients Removed from the soil by four hills of Hops.

	Hops	Leaves.	Bine.
Silica	268·11	59·24	16·63
Chloride of sodium	90·28	46·31	17·73
Chloride of potassium	20·82	—	26·41
Soda	—	1·90	—
Potash	314·00	72·96	66·72
Lime	199·27	242·39	106·12
Magnesia	71·95	11·66	11·23
Sulphuric acid	67·46	24·60	9·43
Phosphoric acid	122·21	11·81	18·63
Phosphate of iron	92·90	17·13	1·10
Total weight	1247·00	488·00	274·00

6. Amount of Mineral ingredients Removed from the soil, by an acre of hops.

The number of hills of hops to an acre, varies in different localities. In some places 1000, in others 1260, in others 1440 hills go to the acre.

In the present instance I believe about 1000 to be the number of hills contained in an acre.

Therefore by multiplying the numbers in the preceding table by 250, we shall have the actual weights of the various inorganic ingredients of the soil, removed from an acre of land by the hop.

For the convenience of agriculturist, I give in the following tables these weights in pound and ounces *avoirdupois*.

Amount of various Mineral ingredients Removed from an acre of Land by the Farnham Hop.

	500 lbs. of Hops.		146½ lbs. of Leaves.		280 lbs. of Bine.		Total in Hops Leaves and Bine.	
	lb.	oz.	lb.	oz.	lb.	oz.	lb.	oz.
Silica	9	9	2	2	0	9½	12	4½
Chloride of sodium	3	3½	1	10	0	10	5	7½
Chloride of potassium	0	12	0	0	0	15	1	11
Soda	0	0	0	1	0	0	0	1
Potash	11	3½	2	10	2	6	16	3½
Lime	7	1¼	8	10	3	13	19	8¼
Magnesia	2	9	0	6	0	6½	3	5½
Sulphuric acid	2	6¾	0	14	0	5¼	3	10
Phosphoric acid	4	6	0	7	0	9½	5	6½
Phosphate of iron	3	5	0	10	0	0½	3	15¾
Sum Total	44	8	17	6	9	11½	71	9½

By a comparison of the amounts of the various inorganic constituents taken from an acre of land by the hop, with the amount of the different mineral ingredients supplied to an acre of land by different manures, it will at once be apparent that POTASH is the most important ingredient necessary for the hop.

The average quantity of potash contained in guano is 3 lb. per cwt.

The straw of wheat contains on an average 5 per cent. of ashes, and every 100 lbs. of the ashes contain about 13 lbs. of potash.

Farm-yard dung contains on an average 7 per cent of mineral ingredients. These contain about 3½ per cent. of potash.

The following table which gives us the weights of different manures necessary to furnish 17 lbs. of potash to an acre of land, will make it apparent that the large quantity of potash taken out of the land by the hop, is the main reason for the necessity of manuring this plant highly.

7.—Quantity of Guano, Farm-yard Dung, or Wheat Straw, necessary to furnish the 17 lbs. of Potash taken from the Soil by the acre of Farnham Hops.

Hops, leaves, and bine, of one acre of hops, containing 500lbs. hops, 146½ lbs. leaves 289 lbs. bine.	Guano.	Wheat Straw.	Farm-yard Dung.
935½ lbs.	7 cwt.	23 cwt.	61 cwt.

It is evident from the foregoing table, that though 2 cwt. of guano is amply sufficient to supply the acre of hops with its phosphates, yet, that it requires 7 cwt. to supply the potash. Consequently the 5 cwt. of guano might have been replaced by a cheaper manure destitute of phosphates, but containing 12½ lbs. of potash.

Hitherto we have spoken as if the hops, leaves, and bine of the acre of Farnhams were of the usual or average weight. But this was not the case. Owing to the unkindly weather, the yield was very deficient. It is no uncommon thing in some districts to grow a ton of hops an acre. We will suppose a farmer to grow a ton of hops per acre, and that the mineral ingredients of the hop are in the same proportion as in those which were analysed.

We will suppose that the bine and leaves were double in quantity, but containing the same per cent. of inorganic matter as the others.

The following table will then show us the weight of guano, wheat straw, or farm yard dung, per acre, necessary to be put on the land, to replace the potash withdrawn by the hops, bine, and leaves.

8.—Quantity of Guano, Wheat Straw, or Farm-yard Dung annually necessary to replace the 64lbs. of Potash taken from an acre of Land by a ton of Hops, with bine and leaves corresponding.

Hops, leaves, and bine of one acre of hops, containing 240 lbs. of hops, 293 lbs. of leaves, 578 lbs. of bine.	Guano.	Wheat Straw.	Farm-yard Dung.
3111 lbs.	1tn. 5cwt.	4tn. 7cwt.	11tn 13ct.

Now as the whole of the above methods of furnishing the necessary amount of potash are enormously expensive, we are necessitated to look to other and cheaper sources for this valuable substance.

Several salts of potash are well known in commerce, and likewise to the agriculturist. Nitrate of potash or saltpetre is one, and common pearlash is another.

Saltpetre contains about 47 per cent. of potash, and pearlash about 68 per cent. By calculation, therefore, we find that 64lbs. of potash taken from the land by a crop of hops, would be replaced by

136lbs. Saltpetre at a cost of about 32s., or by 94lbs. Pearlash at a cost of about 33s.

The weights of saltpetre or pearlash given above would supply the deficiency of potash supposing the whole crop, including bine, leaves, and hops, were removed from the land. But if the bine and leaves be allowed to rot on the ground about *one-sixth* less than the preceding amounts would be sufficient. The impropriety therefore of removing the bine, &c., from the land, as is too often the case, is very apparent.

One of the most important points to be deduced from these analyses, is the preparation, at a reasonable expense, of a manure which shall contain all the necessary ingredients for the growth of the hop. Being engaged in the analyses of various other samples of the hop, I am now unwilling to present, as perfect, a manure for the hop, until the comparison of different varieties shall have shown that the hops in divers localities agree in the per centage of their various constituents.

It will be seen by reference to the analyses, that besides potash, the hops contain phosphoric acid, lime, magnesia, common salt, and silica. About 3 cwt. of guano would supply the necessary amount of phosphates. The chloride of sodium would be amply supplied by 1 cwt. of common salt. Lime and magnesia, are doubtless found in sufficient quantities in the land. The silica, perhaps, may be found in sufficient quantities in the land, but it would be better to supply both silica and potash together in the shape of silicate of potash. This compound, however, is not at present an article of commerce, but there is a probability that it will soon be manufactured on a large scale. The sulphuric acid can be supplied by gypsum.

Either of the following mixtures will, without doubt, be found exceedingly beneficial for the growth of the hop.

No. 1.—Manure for an Acre of Hops.

	£	s.	d.
3 cwt. guano, at 8s. per cwt.	-	1	4 0
1 cwt. common salt, at 1s. per cwt.	-	0	1 0
1½ cwt. saltpetre, or 1½ cwt. silicate of potash, at 26s. 6d. per cwt.	-	1	19 9
½ cwt. of gypsum, at 1s. 6d. per cwt.	-	0	0 9
Cost per Acre	-	£3	5 6

No. 2.—Manure for an Acre of Hops.

	£	s.	d.
1 cwt. guano, at 8s. per cwt.	-	0	8 0
1½ cwt. superphosphate of lime at 8s, 6d. per cwt.	-	0	12 9
1 cwt. common salt, at 1s. per cwt.	-	0	1 0
1 cwt. pearlash, or equal value of silicate of potash, at 38s. per cwt.	-	1	18 0
½ cwt. gypsum, at 1s. 6d. per cwt.	-	0	0 9
Cost per acre	-	£3	0 6

Experience will prove whether the above manures are adapted for the end proposed.

It may be to the purpose here to observe, that the constant stirring of the hop ground in the winter, cannot but be beneficial to the hop; as by this means the atmosphere and water penetrate and disintegrate the earth, and thus set free and render soluble large quantities of *potash*, which would otherwise continue to exist in the soil in an *insoluble* state.

Some other interesting points respecting the hop, and the *values* of the various manures which are considered beneficial to its growth, will be made public as soon as the necessary analyses are completed.

WINGERWORTH FARMER'S CLUB.

(ABSTRACT OF REPORT OF DISCUSSION ON "TENANT RIGHT.")

Mr. HOLLAND said: Sir,—The subject for this night's discussion is of so much importance to the tenant-farmer, that I could have wished some other and more able person had brought it forward. The tenant right of the farmer is at present so undefined and obscure, that the valuers themselves are at a loss to know how to act. They take different views, which lead to disputes and protracted settlements; and the tenant only knows he has had so much money to receive, and the other so much to pay, but not a word of what it is for. (*Hear.*) Now one inducement for a tenant to improve his farm is a certainty that if he leaves it, that investment is secured, and that investment, I contend, is labour, and material draining is the foundation of good farming, and the present mode of valuing it, I believe, is to extend it over eight years. But if drainage is done well, it ought to last forty years. (*Hear, hear.*) I contend, therefore, that eight years is not sufficient, and it ought to extend to sixteen years at least: indeed, it was the custom some years ago; why it is altered, I am not aware. The next thing is tillage; and I think that where the work is done well, tillage and half tillage ought to be allowed, as it is evidently the tenant's right. (*Applause.*) The manure, also, ought to belong to the farmer, and then he has an interest in making as much as possible, which will be to the advantage of the in-coming tenant. Buildings, too, if erected with the consent of the landlord, the tenant ought to be remunerated for. (*Hear.*) Bought manures he ought to be paid for, one or more years, according to the quality and durability. There are many other things, such as stubbing fences, road-making, &c., which the tenant had a right to receive compensation for, on leaving his farm, if done within a certain period; because

the in-coming tenant profits by this outlay of labour. (*Hear.*) I will not go into any argument to prove the tenant's rights to these claims, because the justice of them has been admitted by all farmers that I have had conversation with upon the subject; and I feel assured they will not be disputed here. The law of tenant right (if law it may be called where the custom of the district or the will of the valuers constitute it) is so obscure and undefined, that it calls loudly for some legislative enactment to make it clearer; and when we see almost every agricultural society and farmers' club in the kingdom taking up the subject, I do not see why the Wingerworth club should be the last to speak out, when their interest is immediately concerned. (*Applause.*)

CHAIRMAN.—I will tell you what is the tenant-right in this district. Seed and labour only is allowed. The tenant is entitled to dressing, bought manures, seed, and sowing. Eight years is allowed for draining. There is no compensation for buildings or road-making; he is entitled to all fixtures. The tenant is bound to leave all his buildings in complete repair, and all fences and gates; therefore, when a tenant takes a farm he takes it in complete repair, and leaves it so. But it varies very much. In limestone districts, all manure belongs to the tenant, and they have tillages and half tillages. In Leicestershire there is none at all. The manure should belong to the tenant, and then he has an inducement to cultivate his land. (*Hear.*) He should have the manure and a way-going crop, or not more than one-fourth part of the whole farm—that is to say, he would have the amount of money in his crop and would be entitled to his valuation on it: it would produce more compensation than tillages, and half tillages, because it would be his own property

that he was increasing. It was for this reason they found the land better cultivated on limestone-soils than in this district, because they were always safe. (*Hear, hear.*)

Several other speeches were made by the Chair-

man, Mr. Bacon, Mr. Riggott, Mr. Denham, the Secretary, C. Binns, Esq.; Mr. Giles, &c. Almost all the speakers agreed with Mr. Holland.

Mr. Denham only contended that the landlord ought to have the tillages.

ENGLISH AND SCOTCH FARMING.

DEAR SIR,—You requested me to send you some remarks upon the farming in Warwickshire, and I have much pleasure in doing so.

When you asked me to report on English farming, I believe both of us thought that my report must be all against English farming, particularly in this and other central counties, when compared with Scotch farming. We were both very much mistaken. In passing hurriedly through these central counties of England, as we have formerly done on our way to London, we see little of the details of farming, and form our opinion of the state of agriculture chiefly from the great clumsy waggons, the heavy and inefficient ploughs, and the expensive misapplication of horse-power, which meet our eyes on all sides, and which we hastily conclude must belong to an age of prejudice and general ignorance. But these are only the outside defects of the machinery; and a minute examination of the farms leads to a very different conclusion as to the details of English farming. I hesitate not to say, that the farming in many parts of Warwickshire is as good, or better, than in Wigtownshire or Ayrshire—though it is much in the same way as I would say a man is a good walker if he beats another on a road, at a great cost of physical power, although loaded with his great-grandfather's boots, which happened to weigh each a hundred-weight.

I do not mean to say that an English farmer is able to pay more rent for his farm than a Scotch farmer would do—quite the contrary; but he grows better crops on the same quality of land, feeds better, raises more manure, puts on more compost, keeps his land more clear of weeds, and his houses, farm roads, and fences in better order; so that, in my opinion, the English farmer only requires to throw off his grandfather's great cumbersome implements to beat us both in neat and profitable agriculture.

I cannot better point out in what we are inferior to English farming than by quoting a criticism upon us by an English farmer. He told me, last night, that a friend of his, a gentleman who had farmed 2,000 acres in Lincolnshire, went to reside in Scotland; that he had there an opportunity of seeing a good deal of Scotch farming, and the distinguishing characteristic of it was *slovenliness*. If slates were blown off the houses, he said there was no repair till the houses were half-ruined, and perhaps cattle injured by cold and wet, unless the landlord made the necessary repair; the windows and doors never painted, but allowed to take water and become rotten in a few years; fences neglected, and openings left, when a trifle would have repaired them, till the

crops are damaged, or cattle injured by wandering, to ten times the amount which would have repaired the fence, or even have made a new one; farm roads neglected, or no farm roads, when a day or two of the farm horses at an *idle* season would have saved *twenty* days' work at the busy season, and much tear and wear both of horses and carts—(true, most true!); slovenliness in cleaning fences and cutting down weeds, and also about the houses and courts, where a very little taste and exertion at odd hours would add very much to the comfort and health both of bipeds and quadrupeds. There was a further catalogue against us, but I will now conclude with one more item—our slovenliness in a great many little things, as stepping over a tool, or a stone out of order, without putting it in its proper place, and following in fact “a weil enough system,” which you may understand; or as an Englishman would say, we want the activity and taste required to carry out that order and cleanliness on our farms which an Englishman delights in.

You will think my English friend a little severe in his criticism, and of course it does not apply to half a dozen top farmers in every district; but I fear, if we take the mass of Scotch farmers, there is too much truth in all of it. At least we will all do well to look at home, and, throwing aside our Scotch prejudices, consider each of us how far we are liable to the criticism. Every system of farming has its good and evil points, and our study should always be to consider the details and results in the good as well as the ill farmed districts of both England and Scotland; and in my experience I have never failed to find something to adopt from ill farmed districts, as well as something in Norfolk or the Lothians inferior to our own practice. By bringing the above criticism before your readers, they may see something to adopt or correct, but I am not sure that the instruction will come home to them with such force as it did to me from an intelligent English farmer, with English neatness and order, and convenience of farm roads, &c., all laid out before me.

But now for the other side of the picture, and to show in what our Scotch farming has the advantage—this may best be done by pointing out the evils of the English system; and

1st. The great hindrance to profitable English farming is the unwillingness of landlords to grant leases for a term of years. To a Scotch farmer it appears wonderful how much some tenants have expended under so discouraging a system; but the general and only possible result of short leases is to check improvement—to cause

draining and other expensive improvement to be either neglected or imperfectly executed; and no inducement is held out to the great body of farmers to forsake the clumsy implements and expensive system of working of their fathers, the effect of which would be to put all the profits of the change into the pockets of their landlords within a year or two after the improvement is adopted. A great part of their clay lands are undrained, and, on the very best managed farms, the draining is quite inefficient—the drains being perhaps 36 feet asunder, and only two feet deep, where they should have been placed at every 16 or 18 feet, and 2½ feet deep.

2nd. This insufficient draining, or the wetness of the land, forms an excuse for a great misapplication of horse power in ploughing the land. A Scotch ploughman would be amused to see five horses in a plough *going one before the other in the furrow*, under the management of two men, turning over a furrow, which we could do much better in Scotland with our well-formed light plough and two horses abreast; and when this regiment of cavalry comes to turn at the land, and gets into close column, he would hardly avoid breaking into a broad *horse-laugh*. The ploughs are no doubt generally of a bad construction, formed to resist draught rather than to throw it off, and with short ill-formed arms, which must make them difficult for the ploughman to hold, even with the aid of two wheels in front, which all the ploughs here seem to have. I saw some new ploughs at a maker's near Warwick of a better construction, but all too heavy for efficient and economical work. I have no hesitation in saying that a Scotch ploughman, with a pair of good horses, will do as much work, and certainly make a better seed furrow, than the two Englishmen will do with their five horses.

3rd. So with their great waggons, drawn by four or five horses, in universal use, there is an immense loss of horse-power, as well as of man's labour. The only purpose for which their immense waggons are at all suited is to carry manure from the towns, or heavy loads to distant markets; and even for that work they are far from economical: they draw in them, with five horses, probably four tons or four and a-half tons of manure; and the hand labour in loading these monster waggons, throwing the stuff to such a height, must be enormously greater than what is required to load our Scotch one-horse carts; the horse power cannot be equally or effectively applied; and the unequal burden thrown occasionally on the wheel horse must often strain and injure it. I know from experience that five horses in our single-horse carts will with great ease draw from six to seven tons, and are filled at probably half the expense, so that even for long carriages our one-horse carts have greatly the advantage. But when we compare the English waggon with the Scotch single-horse cart, *in ordinary work on the farm*, they bear no comparison at all. On the farm the large waggons are unmanageable, and with four or five horses are hardly more than equal to the work of a single-horse cart. An intelligent English farmer in this neighbourhood admitted the superiority of our one-horse carts, and said that if he were beginning now to

farm he would decidedly adopt them in preference to the English waggon.

4th. The English farmer suffers a great loss, both in the cost and dispatch, in preparing his grain for the market, from the want of thrashing machines; and this evil is not reduced by occasionally *hiring* a clumsy, ill-constructed machine, which is done even on farms of a considerable extent. In Scotland, and even in the north of Ireland, now almost every farm of 100*l.*, or even 80*l.* rent, has its well constructed thrashing-machine, drawn by two horses, if water power is not at command, completed at an expense of 30*l.* or 35*l.*, or, with winnowing-machine attached, a few pounds more. The English farmers must adopt this improvement; and they, or the labourers, need not fear that they will find every economy to the farmer produces increased employment and benefit to the workman.

5th. I may observe that while I greatly admire the neatness of the English stackyards, I think unnecessary expense is incurred in raising such very large stacks, containing generally 900 or 1000 bushels of wheat, and also in the very large barns required to receive them. I would recommend the extra expense thus thrown out in a large barn being laid out in the erection of additional cattle houses, enabling the farmers to keep more stock, and to consume part of their straw for fodder along with turnips, in place of sinking their whole straw for litter in their houses or strawyards. Experience shows in Scotland that with turnips cattle require little fodder, and do very well with wheat-straw.

From the remarks thus hastily thrown together, you will see I blame the English farmer for unnecessary expense or extravagance in his management, and the Scotch farmer for *unwise* economy in many things, or *niggardliness*, and to cure our mutual faults may yet take some time; but there is that spirit abroad now which will, I have no doubt, tend to the improvement of both countries. An Englishman, for odd work, might bring neatness and order to our Scotch farms; and the alarm among English landlords on account of the proposed change in the corn laws will force them to grant leases, and tend to a more economical management on the part of English farmers. If a Warwickshire farmer can work his farm with half the number of horses he now employs (as I am convinced he could do), here would be a source from which he could draw security for a very considerable fall in the price of grain. If such were to be the result of the change in corn laws, the possession of a farm for a lease of nineteen or twenty years would certainly lead to such safe means of realizing profit. The great objection is the expense of purchasing new carts and ploughs, and the difficulty of getting workmen to go heartily into the change. As to the mere expense, I believe the saving in one year would pay for all the new implements; and one or two Scotch ploughmen brought in by intelligent farmers, would shame the ploughmen from these old clumsy ploughs, and induce them, too, to compete in the march of improvement. The ploughmen of Warwickshire seem a superior race of men physically; and they might depend upon it the more economically and

profitably farm labour is done, the more labour will be done, the more hands employed, and the better wages given.

Again, for a few hints for the improvement of our Scotch farming from the detail of English practice: we do not, in the west of Scotland, use the drill machine for wheat so much as we should do. Here almost all wheat is sown with the drill machine; and the workers are now busy with the hoe, cleaning between the drills, and cutting down all those seed weeds with which our fields are so often disfigured, and at the same time breaking the hard crust, allowing the air and moisture to get into the ground, and thereby increasing the growth of the wheat.

A dibbling machine is also lately got into use here, to dibble in the seed. Wherever this has been used, the grain looks much more fresh and forward than where it has been sown either drilled or broadcast. I have not yet seen the machine, and am unable to report further about it at present.

Some of the farmers here, immediately after harvest, use a scuffle with very broad soles, to cut under the stubble and seed weeds, which are harrowed and gathered to put into their feeding yards or muck heaps. This serves the double purpose of cleaning their land and raising manure, and in some lands with us might be done with considerable advantage.

The English farmer is indefatigable in raising manure and making up compost heaps; along all his fences and all his roads, every particle of earth, even pure clay, is mixed up with lime or farm-yard dung, and his pas-

tures from such top-dressing have a depth and richness even on very second-rate land that would surprise and delight a Scotch farmer.

I shall be glad if these remarks are of any use to the farmers in your district, either by suggesting any improvement in their management, or exciting to greater neatness and order in their farms.

I am, dear sir, yours faithfully,

G.

Leamington, 25th April, 1846.

P.S. I see you have noticed in your last paper two subjects intimately connected with agriculture. With your views on one of them I entirely agree; while I entirely differ from you regarding the other. I feel that the importance of having better houses for our farm-labourers, and raising their general status—both for the sake of that important class and for the interests of agriculture—cannot be too much pressed upon both landlords and tenants. But I think you are quite wrong in recommending Mr. Davis's theories about thin sowing. I have made the experiment cautiously, and find truly that to sow sparingly, as Davis recommends, we must expect to reap also sparingly; and I am aware that a family of farmers in Wigtonshire, who have been the most enterprising and successful, have, for many years, *proved* that sowing a bushel or two an acre more than the tolerable allowance of seed usually given in Wigtonshire is highly remunerative.—Galloway Advertiser and Agriculturist.

NORTON FARMERS' CLUB.

The monthly meeting of this flourishing institution was held in their room, at the Bagshawe Arms, on Monday evening, May 4. W. J. Bagshawe, Esq., the president of the club, presided. After the usual preliminary business, connected with the library, &c., the secretary suggested that the question on turnip sowing, put down for this evening, should be postponed, owing to the absence of several members at neighbouring fairs, who were expected to take an active part in the discussion.

Mr. ROGERS read a letter which he had received from W. Shaw, Esq., a member of the Farmers' and Graziers' Mutual Cattle Insurance Association, in London, wherein the advantages of cattle insurance were pointed out. In alluding to the projected formation of a similar institution here, it was shown that nearly all local associations of the kind in Cheshire, Derbyshire, and other places have been broken up, owing to the inadequacy of the funds to meet the numerous losses. The Farmers' and Graziers' Association had paid three persons for eleven losses, two for twelve do., four for thirteen do., three for fourteen do., one for fifteen do., two for sixteen do., and one for the loss of no less than twenty-one head of cattle, besides a great many others for smaller numbers. There was another institution, too, which had been advertised in the *Independent*, offering similar advantages to the above. He (Mr. Rogers) thought it his duty to

mention the above facts, in order that members might be in possession of information for their guidance.

Mr. T. HAZARD stated that it was his intention to withdraw his motion respecting the formation of a cattle insurance society. He was now convinced that the insurance of cattle could be more easily accomplished in certain existing institutions than they could be by any local associations in the country, without incurring considerable labour and expense.

Mr. ROGERS, since no other matter was on the notice paper, read an admirable lecture of Professor Playfair's, recently delivered in the Athenæum, at Manchester, on the chemistry of vegetation, which gave rise to an interesting conversation, the president taking an active part. Lime being an article in extensive use here, as tillage, the attention of members was more particularly drawn to the following extract from the able lecture alluded to, which we have no doubt will be acceptable to many of our agricultural readers. The Professor said—

"When a chemist, in his laboratory, wishes to liberate the potash or silica from a soil he is analysing, he mixes it with lime, and heats them together. By this means he renders soluble, in acids or in water, all that was insoluble before. The farmer performs exactly the same operation as the chemist, when he limes his land. He liberates by its means the

silica, the potash, and the phosphates from the soil, and enables them to administer to the wants of vegetation. But by this operation he has furnished to his land no equivalent for that removed by crops; and, therefore, it must infallibly happen that the continuance of the system is merely a continuance of a rapid system of exhausting the soil. It was true that a rich clay, abounding in potash, might long survive the treatment; but it was as certainly going on to exhaustion as a granary of corn, out of which was taken every year a certain amount of grain, and there was merely put in its place the key with which we opened the granary door. The lime is merely the key with which we open the magazine of food contained in the soil. Not unfrequently, however, the lime itself might supply an absent constituent of the soil, especially in cases, such as for clover and grasses, which experience much benefit from a top-dressing of lime. He did not say that the former use of lime was altogether illegitimate, because he had shown that clays often contain potash enough to last for thousands of years, if nothing more than this ingredient were required; but at the same time it must be remembered that the lime aids the plant in removing the phosphates, sulphates, and other ingredients, which may be required for the purpose of their organism, without restoring what is abstracted. He had frequently found, on examining some limestones, lauded for their superior excellence, that their action seemed to be due to the presence of some adventitious ingredient, such as magnesia, which could have been much more effectually supplied by other means. *There was no manure more beneficially used, or more disgracefully abused, than lime.* In its principal action, it had no right to be called a manure; for a manure consists in the restoration to the soil of ingredients taken from it. But lime affords a key so easily applied, to rob the soil anew, that a farmer, who works slovenly, often contents himself with the application of lime, and by its means attains the same result (accompanied, however, by a destruction of property) that he would by the drainage of land, and by a proper system of rotation. Hence it was often substituted for the drain; for the disintegration which the air should effect in a drained field, was obtained by lime in one undrained. But the system in the latter case was a ruinous one to the landlord, and even to the tenant if he remain on the soil; and the cause must be obvious, as he applies the lime without the knowledge of the quantity which should be used; and, as he does not follow it up by a proper rotation—first, to take up the liberated potash, and then the liberated silica and phosphates—a large part of the valuable ingredients of the soil are washed away without benefit to it. A favourite mode of applying lime was to mix it, while still hot, with earth, and, after it has slacked itself, to spread the mixture over the field. Thus used, a powerful effect was produced by the lime, in liberating the alkalies of the earth with which it was mixed; so that, when spread over the field, there was spread with it a stock of nutriment in immediate readiness for the plant. All the processes he had hitherto considered were methods with one object in view—the rendering soluble the nutritious ingredients of the soil; not the supply of materials which that soil may want.”

There is another short extract worth giving, for the information of those who are discontented with guano:—

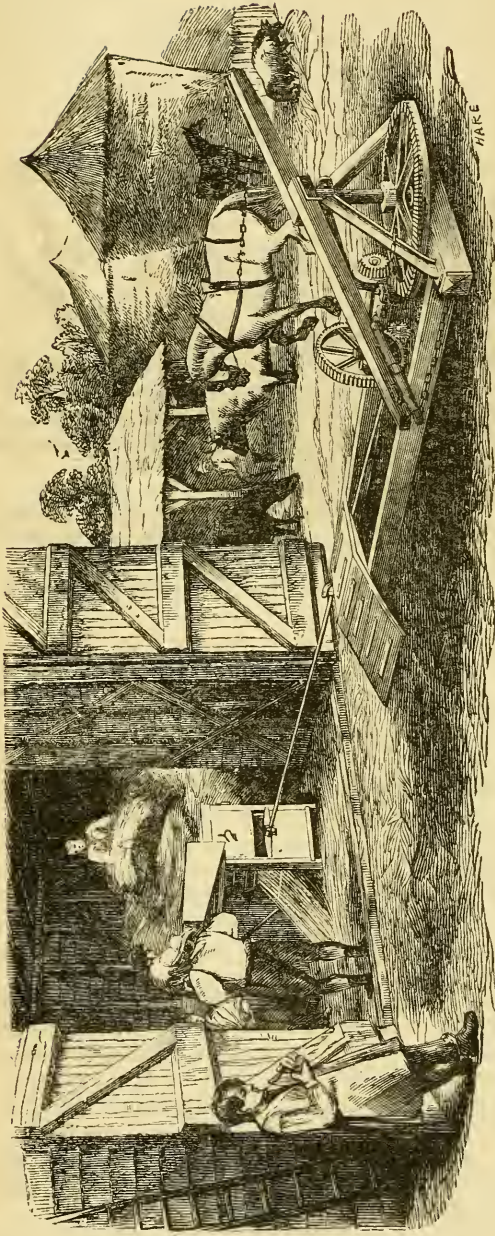
“When the farmers use guano as manure for corn, they are robbing the soil, in the grain, of large quantities of silicate of potash, which they do not replace. Then was guano not to be used? Certainly it was; but it must be used together with silicate of potash, which was obtained from decaying straw, but much more conveniently from manufacturing refuse, and it might be manufactured with great ease. He happened lately to be in a coach with two farmers who were talking of guano;

and one said it was a capital manure, and the other asserted it was good for *navvies*.” On asking what sort of soils they had tried it on, he found that the one who said it was a good manure had tried it on a clay soil; and the other, who condemned it, had put it on a soil almost wholly sand, which contained but little silicate of potash. This farmer had no right to blame the advance of science, which had brought guano into the country; for, if he had consulted science, he would have found, that, though good for some soils, the guano could not supply to his land the place of the decaying straw. Science was now beginning to make its way into the farmer's home. So far from an ounce of practice being worth a ton of theory, it was beginning to be found that an ounce of theory would produce a ton of practice; and the farmers who did not keep up with the present state of science would be left far behind. Experience had done much, but had not generalised its practice. It was for science to explain that experience; and then the farmer would be enabled to cultivate his soil, however different from that to which he had been accustomed. The farmer, then, should not look suspiciously upon science, but rather hold out the right hand of fellowship to it.”

In answer to a question from Mr. Hazard, Mr. Veale said he would recommend about three tons of lime to the acre on fallow, and a less quantity for grass. A prolonged conversation followed, in which the President, Mr. R. Lisle, Mr. Bingham, Mr. Veale, and others joined, and the meeting concluded by proposing a vote of thanks to the President for his valuable services.—The next meeting will be held on the 8th of June, when Mr. John Greaves has announced his intention of giving a paper in vindication of the present system of tenure, &c.

HARLESTON FARMERS' CLUB.—SIXTH MEETING FOR 1846.—May 6th.—Subject, “The breaking up of old pasture land: its advantages and the best process.” Resolved:—That it is highly desirable to break up a large portion of the heavy land pastures in this district, thus adding to the sources of labour and increasing the produce of the soil. That thin paring and burning the flag is the best process of converting such lands into tillage, spreading at least two-thirds of the ashes on the new soil, and carrying the remainder, if desirable, on to the old tilled lands. The Club not only considers that the first should be a root crop, for which the ashes will be an excellent preparation, but recommends that the succeeding crop or crops should be roots also. Aware of the prejudice which most landlords entertain against the breaking up of old pasture land, it is believed that making it compulsory to crop new lauds with roots for the first two or three years (for the growth of which they are so well calculated) will tend to diminish their objections, and be at the same time advantageous to the tenants, as the manure from the extra root crops will be more beneficial to the old lands than the manure from the extra straw crops would have been, and the whole farm will be thus improved instead of impoverished. Draining and claying in the interim will prepare the land for the corn crops at the expiration of the limit, and by breaking up annually a portion only of the pasture intended to be converted, the whole will come regularly into course with the old ploughed lauds. It is believed that permission thus given to break up inferior pasture land will encourage good farming amongst the tenantry by increasing the fattening of cattle and reducing the stock of cows, which it is well known, as they are generally kept, impoverish the land as much as cattle and sheep improve it.—ROBT. B. HARVEY, Secretary.

BARRETT, EXALL, AND ANDREWES'

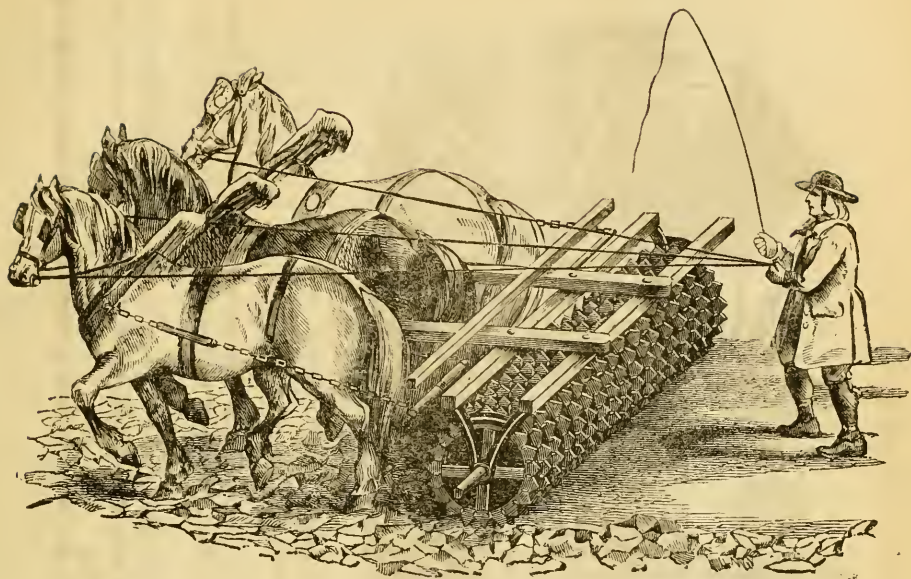


TWO-HORSE POWER THRESHING MACHINE, WITH BEVIL GEAR-WORK,
AS IN OPERATION.

The success, which has borne such ample testimony to the value of their patent hand-threshing machine, has induced these gentlemen to apply the same principle to those worked by horse-power; and the result of nearly twelve months' experience shows that their efforts have not been misdirected.

This machine is most conveniently portable, being much smaller and lighter than an ordinary winnower; and a gentleman, who has one in use, reports that it is capable of threshing every variety of grain without injuring the straw, and that its average performance is fifteen quarters of wheat per day, and other grain in proportion.

The horse work, as shown in the engraving, is exceedingly simple, and when mounted on wheels forms a compact carriage for the barn work and fittings, and is easily drawn by one horse.



GROSSKILL'S PATENT CLOD-CRUSHER AND ROLLER.

At no period of the history of British agriculture was the necessity so great as it now is, for enlisting in its service every development of mechanical science that can be economically brought to bear on the cultivation of the soil. The varied processes of tillage must be carried out with increased energy and intelligence; no needful operation must be omitted, or negligently performed; and when we consider the vast power of machinery, its adaptation to the most delicate as well as the most laborious tasks, the rapidity with which by its agency large surfaces can be operated upon, and the consequent saving of time, which in our variable climate is of the highest importance, we feel justified in re-enforcing that which experience has long established, namely, that *by the aid of machinery a greater amount of labour can be performed in a superior manner, and at a less cost, than by manual exertion.* It will be evident, then, that we are not advising a *larger*, but a more *judicious* outlay of the capital employed in husbandry.

To pulverize clods and reduce a strong soil into a fine tilth, in dry seasons, has always tasked the powers of manual labour beyond its strength; nor have the almost endless variety of ploughs, drags, iron and stone rollers, that have from time to time been employed for that purpose, been much more successful. The operation, therefore, even where practicable, has always been expensive, until the introduction of an implement on the principle of that shown in our engraving, which we know to be a most valuable and effective crusher and roller, and which, whether required to prepare the land for seed, or for rolling the young plant when it is from three to eight inches out of the ground, or to check the destructive ravages of the wire-worm, grub, or snail, it is decidedly more efficient than any other implement now in use for such purposes.

EARL TALBOT'S PLAN OF STALL-FEEDING SHEEP.

Our columns have frequently contained evidences of the great anxiety of Earl Talbot, the highly-esteemed Lord Lieutenant of this county, to promote to his utmost, both by precept and example, the improvement of agriculture in all its departments. His lordship's Ingestre estate presents a most beautiful specimen of land brought into the highest state of culture; but perhaps a greater triumph of the combination of science, capital, and skill, is exhibited in the wonderful change which has been effected on his lordship's Birchwood Park Farm, which a few years ago was comparatively valueless, though it is now producing every year large and luxuriant crops. This estate is in the parish of Leigh, about six miles beyond Ingestre, not far distant from Fradswell Heath, and, before his lordship commenced his improvements in 1841, corresponded very much in regard to sterility with the adjoining common. The soil is naturally a cold, wet clay; but by adopting a complete system of drainage, and by the application of suitable manures, its capabilities have been so greatly improved, that last year fifty acres of turnips, of great size, and which turned out perfectly sound, were grown upon it; and a rickyard, containing about seventy stacks of wheat and other grain, attest how successfully Lord Talbot's intentions have been carried out by his intelligent and indefatigable resident bailiff, Mr. Craven. Improvements on this estate are yet in progress, and Lord Talbot himself bestows a great deal of personal attention upon them. The land is still too cold and moist to allow of sheep to be fed out of doors upon turnips; and this circumstance induced Lord Talbot to despatch Mr. Craven to the Rev. Mr. Huxtable's farm in Essex (if we remember rightly), and to Sir Richard Simeon's, in the Isle of Wight, to make some inquiries into a plan of operation on those farms for feeding sheep within doors. Mr. Craven, profited by his observations, returned to Birchwood Park, and, improving upon the practice of Mr. Huxtable and Sir R. Simeon, though borrowing important parts of the plan of each, has adopted a system of stall-feeding for sheep, which promises to be attended with most satisfactory results. The building which has been erected for the purpose at Birchwood Park is a parallelogram, sixty feet long by fifty wide. The sheds for the sheep occupy three sides, and the fourth is intended to be used as a store for turnips. The sheds are fifteen feet in width. On each side are the stalls, which are two feet wide, three feet long, and are separated from each other by a wooden partition two-and-a-half feet high. Each stall is supplied with a feeding trough or manger; a light chain, nine inches long, is attached by a ring to a staple about the same length, which allows the chain to move up and down; and to the other end is affixed the strap, which is buckled round the neck of the sheep. The stalls are not wide enough to allow the sheep to turn round in them.

A tank or gutter, two feet wide and two feet deep, built of brick, grouted with barrow lime, runs down each side of the shed, immediately behind the sheep; it is covered with a wooden grating, the spars, which are two inches in width, being only three-quarters of an inch apart, and therefore allow the sheep to stand upon them with their hind feet without being entangled. The use of this tank is to receive the droppings from the sheep. A passage down the middle of each shed, three feet six inches wide, paved with stone flags, has a very neat appearance. The sheds are entirely closed on the outer side to the roof; but on the inner side the wall is only breast high, the space to the roof being left open to admit air and light. The roof is formed of a framework of wood, covered with the patent asphalte felt, and has a light and suitable appearance. The building altogether is admirably adapted for its purpose, and is by no means of an expensive style. It is calculated for the feeding of 150 sheep. The sheep, which are at the present time fed upon sliced turnips, are served with their food three times a day; and a little sawdust strewn behind them, and swept with the manure into the tanks, serves to keep the sheds perfectly clean. The tanks are emptied when occasion requires, the wooden grating, in lengths of only about six or seven feet, being easily removed for the purpose. When this operation is in progress, the sheep can be removed to the yard or area between the sheds, which is also intended to receive them when it is necessary they should occasionally feel the use of their legs and feet. This system of stall feeding sheep, it is believed, will answer many valuable purposes. As in the case of Lord Talbot's Birchwood Park Farm, where these useful animals cannot be fed on turnips out of doors, though the land grows the food in abundance, they can be fattened in these sheds. The economy of food will be great, as none will be wasted, and smaller quantity will suffice for animals kept in a state of quietude. It is also expected that the sheep will fatten in a much shorter time. They will not be liable to foot-rot, a disease so detrimental to sheep, and so common on wet farms. The manure collected in the tanks will be exceedingly valuable. When dropped in the fields its strength is wasted by evaporation; here it will retain its virtues, and form a highly concentrated and pungent manure, equal in point of utility, it is thought, to the richest guano. Perhaps a point of greater importance than any to which we have adverted is that the mountain sheep, which are found so difficult to feed on account of their rambling propensities, will become quiet feeders, and thrive in an extraordinary manner. Welsh sheep can scarcely be induced to feed upon turnips out of doors; but at Birchwood Park they may be seen in the stalls, and Cheviots likewise, enjoying their meal of turnips, and submitting to discipline with as much gravity as our English Southdowns and Leicesters. It is

quite surprising to observe how fully reconciled the sheep become to this new mode of life. Timid as they proverbially are, they do not seem alarmed by the approach of strangers; and when the attendant uses his besom close at their heels, they remain undisturbed. After feeding, they lie quietly down; and this state of repose has unquestionably a tendency to encourage their rapid fattening. We had the opportunity, a few days ago, of seeing this new system in operation at Birch-

wood Park, and have given the result of our observation for the information of our agricultural friends; and we have no doubt that any of them, desiring more fully to inform themselves on a subject of so much importance, and to witness this novel and interesting sight, will be treated with the same civility and attention which were shown to us on the occasion of our visit.—Stoffordshire Advertiser.

MONMOUTH FARMERS' CLUB, MARCH 4.

ON "LANDLORD AND TENANT RIGHTS."

After Mr. Crawford had concluded, J. G. George, Esq., delivered a short lecture on the above subject:—

"The subject which it has fallen to my lot to introduce to your notice, is one of vital importance to the agricultural interest; for upon the temperate discussion of the question, and the clear understanding of the rights of Landlord and Tenant, as settled upon equitable principles, must depend chiefly the well-being of both classes. To discuss thoroughly all the different rights of Landlord and Tenant would occupy many evenings; and I would, therefore, call your attention upon the present occasion to the question of *Tenure*; and I wish it clearly to be understood that I myself do not pretend to lay down any fixed rules upon the subject. My object as a landlord is merely to raise the question, and to ascertain, as far as possible, from the practical farmers their opinion upon the subject. I am fully persuaded that the best chance for a landlord to obtain tenants with capital and skill is to grant leases, say for twenty-one years; but before a landlord can be called upon to part with the control over his land for so long a period, he ought to be satisfied that the tenant has the required skill and capital. Now, gentlemen, I would call your attention to the fact that the great bulk of the farmers in this part of the county of Monmouth occupy small farms with small means; and I much doubt whether they would like to run the risk of binding themselves to pay a fixed rent for a long period of years. It may be asked, Why not turn three or four farms into one, and then offer leases of twenty-one years, and you will get a superior class of tenants? This may probably be the result; but then comes the important question, What will you do with the old tenants?—would it be right to deprive a great number of honest, hardworking men of the means of getting a living? I am sure you will say, certainly not. And I much doubt whether, even if we could make arrangements to enlarge our farms, strangers to our soil would thrive amongst us; and I would quote the remarks of Mr. George Buckland, in his excellent essay 'On the Farming of Kent,' R. A. J., Vol. vi., p. 283, upon this subject, as well worth your consideration:

"Amongst improvers of weald-clay land, Mr. Schreiber, of Henhurst Lodge, may be honourably mentioned. It is important to mention here that when Mr. Schreiber commenced his

improvements he brought with him most of the approved modern implements of the eastern counties, which after repeated trials and untiring perseverance, he has by degrees almost abandoned, and has adopted the implements and mode of culture common to the district. This fact leads us to remark, whatever theorists may say to the contrary, how important it is that a man should practically understand the nature of his soil before he steps very far from the beaten path of cultivation. It is generally found that those who have been brought up to farming in the weald succeed much better than strangers.'

"My opinion is that any lease for a less term than ten years is a disadvantage to a tenant, as many landlords who grant leases, say seven years, consider they have a moral right to make a fresh bargain at the expiration of the term; and if the farmer has ventured to invest his capital in the improvement of the land, he will run the risk of paying interest upon such capital in the shape of increased rent; and probably the same landlords would not on any account give a yearly tenant notice to quit, unless they had good reasons, such as great arrears of rent, or negligent farming.

"The farmers will probably say, 'Having pointed out the difficulties in granting leases to us, tell us what system of protection you would propose for us if we are able and willing to invest our capital in permanent improvements of our farms.' In reply to the question I would state as my opinion that the best and most equitable system that could be introduced in this neighbourhood would be agreements by which the tenants' right to unexhausted improvements shall be fully provided for. This system has been found to answer exceedingly well in North Lincolnshire, and is also recommended by the Loughborough Agricultural Society; and I would direct your particular attention to two letters on this subject in the sixth volume of the R. A. J., p. 44, the one by Mr. G. M. Williams, agent of the Earl of Yarborough, and the other by Mr. George Stokes, and both directed to Philip Pusey, Esq.; and as probably some of my hearers may not have an opportunity of referring to these letters, I will, with your permission, read them, as they will fully explain the system which I venture to recommend to your serious consideration. And I would also call your attention to what Mr. Baugh Mackay, in his Essay on the Agriculture of Norfolk, vol. 5, R. A. J., p. 346, says upon this subject:

"Indeed I would venture to submit, that if Great Britain were divided into three parts, and each let separately under one of the following agreements, all the land might be cultivated in the highest possible manner; for, although this division would allow each owner and each tenant to select the one agreement best suited to his own feelings, all would be so far founded on justice to the party who expended his capital for the improvement of the soil as to insure the most liberal outlay of it."

"1st. Leases."

"2nd. Insert a clause in the lease granted, under which the owner should have the power to cancel it, on giving eighteen months' notice, and paying to the tenant such sum as two arbitrators (one for each party) should think a fair compensation to the tenant for his permanent improvement, bearing in mind all the circumstances of the case affecting landlord and tenant."

"3rd. By giving the tenant a clause, under an agreement as a yearly tenancy, by which he would be entitled to a fair and equitable allowance for all permanent improvements made at his expense, but with the sanction of the owner, on written notice of such intended improvements having been given to the latter or his agent, and not having been answered within a given period, or in time to prevent that outlay which the owner of the land would not sanction."

Gentlemen, I have frequently referred to the *Royal Agricultural Journal*; and I would earnestly request every farmer who wishes to go-a-head to carefully peruse it. He will there find the very best system of farming different soils clearly explained; and he will, by a careful perusal of the valuable essays upon the agriculture of several counties in England, also discover what a vast improvement can be effected in the science of farming by energy and perseverance.

"Before I conclude, allow me to call your attention to a rock upon which many an industrious farmer has been wrecked, and just at the time that he has considered himself in smooth water. I mean the too great eagerness to get into a larger farm. I would caution every farmer, before he much increases his farm, to calculate his increased liabilities, and clearly ascertain that he will be able to provide for such increase, not only in fair weather but in foul. Depend upon it that a farmer, in a moderate-sized farm, with a few pounds at his banker's to meet his half-year's rent, is much better off than he would be in a larger farm with all his capital invested in his stock. In the former case it is true he has small interest, but it is certain: in the latter case, he may probably be compelled to sell, just at the time that he ought to hold; and these forced sales, by depressing the markets, not only injure the farmer himself, but his brother agriculturists."

LONDON SEWERS.—We understand that a company is in course of formation, for the purpose of collecting, by chemical means, the *whole contents* of the metropolitan sewers, with a view to their application to agricultural purposes. The intention of this company is, to work out the patent lately granted to Mr. William Higgs, whose labour as a lecturer in this department of science we have several times had occasion approvingly to notice. His plan seems to embrace several points of importance, two of which deserve particular attention—first, the separation and precipitation of the phosphates and other

valuable matter chemically combined with the water; and, secondly, the condensing and solidifying the noxious effluvia which, under ordinary circumstances, would contaminate the atmosphere. We cordially recommend the plan, not only to the capitalist, to whom it promises an ample return, but to the enlightened philanthropist, who is anxious to improve the conditions necessary to health in towns.—Mining Journal.

TENANT-RIGHT.

MARCH FARMERS' CLUB.

The following are the Tenant-Right that they consider the tenant farmer fairly entitled to:—

1. Leases clear of restrictions for not less than 12 out of 14 years would leave a tenant at liberty to exercise skill and expend capital for the first period of his lease; whilst restrictions for the latter part would secure the interests of the landlord, who in return should allow compensation for occupiers' improvements in the event of death or leaving at the end of a lease.

2. It would at the same time be desirable that an understanding should be had, or agreement entered into previous to the expiration of the lease, as to whether the lease is to be continued in his occupation after the expiration thereof.

3. That compensation should be made to the tenant for all unexhausted improvements to the land, such as claying, liming, hollow or other draining, use of purchased artificial manures, and substantial and necessary farm-buildings; and those only in proportion to the actual value thereof at the expiration of the tenancy, by a valuation of the same by disinterested persons.

4. This part of the country not being stocked with game, there appears no necessity for a statement of the injuries to a tenant thereby.

T. T. ELLIOTT,

Secretary to the March Farmers' Club.

March, Cambridgeshire, Feb. 20th.

TENANT-RIGHT.

EXMINSTER FARMERS' CLUB.

MARCH 16th, 1846.—At a meeting of this Club, held on this day, the following resolutions with regard to tenant-right were unanimously agreed to.

1st. That it is the opinion of this Club that tenant-right is a principle which must be admitted in future in all agreements between landlord and tenant.

2nd. That this right consists in his having secured to him an adequate return for his expenditure of capital on his farm, by the length and certainty of his tenure, or by a fair compensation for his outlay and improvements on quitting it.

3rd. That to secure this object, it appears desirable that leases should be granted for 21 years, renewable at the end of 14 years, and also that a series of general rules should be framed for the guidance of both landlord and tenant, with a view to effect a definite settlement of tenant-right.

4th. That to prevent the deterioration of the soil, every tenant should be required to cultivate his estate to the end of his term, the same as he would do if about to continue it, and thereby prevent a loss to the community by a diminution of produce.

5th. That a copy of these resolutions be transmitted to the Secretary of the London Farmers' Club, with a suggestion that the series of rules about to be prepared by the Committee of that Club, should be forwarded to the various local Clubs for their opinion before being finally adopted.

JOHN DREW, Sen., Secretary.

Powderham Castle, near Exeter.

REMARKS ON THE AGRICULTURE OF ABERDEENSHIRE.

No. II.

CLIMATE.

Having in my last paper adverted at some length to the nature and quality of the various soils met with in Aberdeenshire, I now proceed to make a few observations on the character of its climate. It may be supposed that this county, in consequence of its high latitude, and of the number of lofty mountains and extensive wastes with which it abounds, is subject to a much more rigorous and ungenial climate than is actually experienced. The fact is, that the low-lying parts of this district enjoy even a higher degree of temperature during winter than many of the southern counties of the island. In the vicinity of the sea-coast snow seldom lies long upon the ground, and the frost is rarely so intense as to interrupt the operation of ploughing, which is obviously of great advantage to the farmers in that locality. It is considered that in ordinary winters the temperature is seldom so low, or the frost so intense or protracted, as in the county of Middlesex; indeed, Dr. Anderson has recorded that in the year 1762, when the frost was so severe in England that the Thames at London was frozen over for many weeks together, the weather was so mild in Aberdeenshire as scarcely to interrupt the ordinary operations of agriculture; and though a little snow lay for some weeks upon the surface of the ground, there was not a day during the whole season that a plough could not have gone. As a proof that the climate is not uncommonly backward, he mentions having had, on the 4th June, 1779, a dish of ripe peas, which were grown in the field, within a few miles of the sea-coast.* The comparative mildness of the climate of the lower parts of this county obviously arises from the large extent (upwards of sixty miles) of sea-coast on the north and east sides. The great disadvantages attending the climate of Aberdeenshire, compared with that of more southern districts, are the lateness of spring, owing to the prevalence of easterly winds, and the frequent occurrence of fogs and rain at that season, which often render the seed-time both late and precarious. The spring frosts and fogs also prove more or less injurious to newly-blossomed fruit trees. In general years, the summer is colder and more humid than in the southern quarters of the kingdom, there being less variation in the temperature at different seasons.

But from the remarks that have been made in

my former article regarding the extent and diversified surface of Aberdeenshire, it will be apparent that the climate is exceedingly various in different parts of the county. For example, the climate experienced in the mountainous regions of Mar and Strathbogie must be widely different from that enjoyed in the vicinity of Peterhead, where the peninsula of Buchan projects a considerable way into the German ocean. In fact, the several mountain ranges and intervening vales possess climates corresponding to their respective altitudes and situations. It is obvious, also, that the drained and well-cultivated parts of the country enjoy a more genial and salubrious atmosphere than those, at the same elevation, which abound with swampy marshes and inhospitable moors. The upland farmers usually experience, every winter, from one to two months of either frost or snow, or both associated, during which period all operations on the soil are necessarily suspended; which is certainly a great disadvantage, but one inseparable from elevated situations. But on the other hand, it has been ascertained that the heat is sometimes greater in summer on the south sides of hills, and in sheltered valleys in the higher parts of this county, than it is immediately adjoining the coast. A great difference has of late years been observed in regard to the period at which the severity of the winter sets in. Snow-storms now seldom occur till about the beginning or the middle of January, at which time ploughing and other farm operations are usually far advanced; but frost generally sets in much earlier than is desirable, and in the vales and low-lying grounds in particular, potatoes are very liable to suffer from its influence at an early stage of their growth. This also frequently happens on the banks of slow-winding rivers, the reason of which is conceived to be too apparent to require any explanation in this place.

The occurrence of hoar-frost so early as the month of July is not an uncommon circumstance in some parts of this county, on which occasions the potato crop is, of course, considerably damaged; but when not seriously attacked till about the middle of October, as is most generally the case, the frosts which may then occur seldom commit more injury than blackening the haulm, and terminating rather prematurely the growth of the tubers. Numerous instances of this have happened during the past autumn. In many parts of this county, particularly in the upland vales, oats and bear are likewise very liable to be attacked by frost before

* Keith's Survey of Aberdeenshire.

attaining maturity, and sometimes so severely as to render the grain altogether unfit for seed. It is always a very serious loss to the farmers of this district when frost arrives immediately before the oat crop becomes ripe, as the vegetative powers of the grain are thereby completely destroyed, and there is no external mark by which the damaged seed can be distinguished. It may, however, be recognized at once, by carefully stripping the husks from the kernels, when the longitudinal groove in the breast of the latter will be observed black and carious, and the kernels may be crumbled with facility between the fingers. It has been ascertained that grain, in a very green and milky state, sustains no injury from these slight frosts; but that if it approaches very nearly to maturity, it becomes quite unfit for seed. The hoar-frost generally occurs during some part of the month of August in the sheltered vales and glens, and it is then that the grain is most liable to injury: it never happens but during a calm, with a clear sky; the freezing cold is confined to the surface of the earth, or to within a few feet of it; for a thermometer, raised only five or six feet into the air, will indicate a temperature of 39° or 40°, when serious mischief is going on below. The injury is strictly limited to the lower and more sheltered lands, as all the higher and more open lands escape. No injury is sustained in very narrow gorges, through which water flows rapidly; although patches of land in them are otherwise low and sheltered. Spaces round mill-slucices, and other small waterfalls, are also free from injury, and margins of from twenty to thirty yards in breadth on both sides of the larger and more rapid streams. If a breeze sets in before sun-rise, no evil follows, although at some previous hour of the night it has frozen at the surface of the ground.*

Notwithstanding the frequent occurrence of these hoar-frosts towards the end of summer, the climate of Aberdeenshire is, in general, sufficiently favourable for ripening oats and bear. Wheat and barley are grown in some parts of the Buchan, Garioch, and Dee-side districts, in which the soil and climate are better adapted to the production of these grains than in other parts of the county. Oats and bear are, however, the principal cerealia cultivated in Aberdeenshire. The culture of beans and peas is attempted in the parish of St. Fergus, and other places in Buchan, where the soil is chiefly composed of adhesive clay; but in general seasons the harvesting of these crops is peculiarly hazardous in our changeable climate. Potatoes and turnips are raised in full perfection wherever the soil has been relieved

from the baneful influence of superabundant moisture.

It may not be out of place to notice here the heights above the level of the sea, at which some of the cultivated plants succeed in this county:—

FEET.

- 1,200 Larch. This valuable tree appears to find, in our region of primitive rocks, a soil well adapted to it; it thrives well at the inferior heights, and ripens its wood early.
- 1,100 Birch.
- 1,050 Scotch fir.
- 1,000 Broom.
- 950 Oats ripen fully here, and are attended by all the plants of our common husbandry in full perfection, including potatoes, greens, and some cabbages; white peas and flax also succeed.
- 900 Ash, elm (*Ulmus Montana*). Gooseberries ripen.
- 800 Cherries, jargonelle pears, raspberries, hawthorn.
- 750 Beech, *Quercus sessiliflora*.
- 700 *Quercus robur* (dwarfish).
- 500 Ribstone pippin apple.
- 450 Achan pear, lime, *Salix alba*, liburnum.
- 420 Silver fir. One fine specimen at Haughton deserves notice, as it shows that the species is well adapted to our soil and climate. It is 92 years old, more than ten feet in girth, and seventy-six feet in height, measuring upwards of 200 cubic feet.*

In ordinary seasons, the sowing of oats and barley occupies from the last week in March to the end of April. In some springs, however, sowing is not begun until about the 1st of April; while in others it is not unusual to have the oat-sowing completed in the low and dry parts of the county by the first week in that month. The present season being unusually mild, the sowing of oats was commenced in some places about the 20th of February. Bear sowing is commonly finished by the 1st of May; potatoes are planted from the middle of April to the same period of the following month; but earlier planting is now recommended, and partially adopted. Swedish turnips are generally sown from the 15th to the end of May; common turnips from the 1st to the 20th of June. The subjoined statement of the dates at which the sowing of oats was begun and finished for some years back, on an extensive farm in the low part of Aberdeenshire,

* See New Statistical Account of the parish of Alford.

* See New Statistical Account of the parish of Alford.

which is rather above the average in point of earliness, may be interesting, as illustrating the character of the climate :—

YEARS. COMMENCED.	ENDED.
1838, April 4 . . .	April 29
1839, March 21 . . .	„ 18
1840, „ 24 . . .	„ 16
1841, „ 27 . . .	„ 22
1842, „ 26 . . .	„ 19
1843, „ 22 . . .	„ 14
1844, April 4 . . .	„ 24
1845, March 20 . . .	„ 15
1846, „ 3 . . .	March 28

The harvesting of grain crops usually begins about the last week in August, but does not become general throughout the county till near the 10th of September. It occupies from four to six weeks, according to the state of the weather. In the upland parts, the harvest is always comparatively late, and often very precarious, owing to the changeable character of the climate. The following are the dates at which harvest was begun and completed for some years past on the farm above alluded to :—

YEARS. COMMENCED.	ENDED.
1838, August 22 . . .	October 6
1839, „ 18 . . .	September 22
1840, „ 20 . . .	October 16
1841, „ 21 . . .	„ 12
1842, „ 14 . . .	September 26
1843, „ 18 . . .	„ 28
1844, „ 20 . . .	October 4
1845, „ 28 . . .	„ 4

The winds from the north and north-east are the coldest and most chilling; the wind from the east conveys rain and fogs, and is peculiarly disagreeable in harvest. Its effect in raising the barometer, or in preventing its fall on the approach of rain, is very frequently to be observed. The south and south-west winds are the most genial.

At Aberdeen, the thermometer has occasionally been observed as low as 13° or even 10° below zero; though not for any long continuance. In summer the temperature scarcely ever rises above 70° or 75° (Fahrenheit) in the shade during the day, while during the night it is very seldom below 60° Fahrenheit. The average temperature of the seven years ending in 1838, has been 46.7. The extremes of heat and cold, as observed at Alford (420 feet above the level of the sea, and twenty-six miles inland from the coast at Aberdeen) during a period of 15 years, have been 84° Fahrenheit the highest, and 4° degrees below zero the lowest. The mean temperature of the seven years ending in 1839, has been 45.0784. At St. Fergus, in the division of Buchan, and immediately adjoining the coast, the mean range of the thermometer in summer is stated to be from 52° to 57°, and in winter from 38° to

48° Fahrenheit. At Aberdeen, the fluctuations of the barometer are not in general either very great or very sudden; it scarcely ever rises above 30.5 inches, or sinks below 28. The greatest rise observed during the seven years ending in December 1838, was 30.2718, in January 1833; the lowest monthly mean was 29.3920, in December of the same year. The mean of the whole period of seven years was 29.87. The mean range of the barometer at St. Fergus is, in summer, from 29.49 to 29.56, and in winter from 29.40 to 29.47.*

The quantity of rain that falls in a year varies from 20 to 38 inches in depth. The average annual fall at Aberdeen during the seven years ending in Dec. 1838, was 21.1 inches; while at Alford the annual mean of the five years ending in 1839, was 38.57 inches. Subjoined is a statement of the average depth of rain which fell at three different stations (Girdleness, Rubislaw, and Leuchar) in this county, during the six months from April to September, 1845, both inclusive, as observed by Mr. John Stratton, of Aberdeen. To afford a comparison, I annex the mean monthly depth of rain which fell at Chiswick during the same period, as given in the "Gardeners' Chronicle":—

MONTHS.	ABERDEENSHIRE.	CHISWICK.
April	1.7 inch	0.95 inch
May	1.2	2.89
June	4.4	1.36
July	2.2	2.31
August	3.5	2.79
September	2.4	1.77

Amount in 6 months 15.4 12.07

The climate of this county has been vastly improved within the last twenty years. The great extension of drainage, the reclamation and planting of large tracts of waste ground, the general adoption of improved cultivation, and the increased growth of turnips and other agricultural plants, have all conspired to render the climate more salubrious, and better fitted for maturing the cultivated crops, than it was before these improvements were effected.

CONNECTION BETWEEN LANDLORD AND TENANT.

It is admitted by all, that the connection subsisting between the proprietors and the occupiers of land exercises a most material influence either in accelerating or retarding agricultural improvement, according as it may be adjusted on liberal and equitable principles, or the contrary. And as very much of the acknowledged superiority of Scottish farming is doubtless to be ascribed to the mode in which the relation between landlord and tenant has long been regulated, it is hoped the following

* Statistical Account.

observations on Aberdeenshire leases, &c., may prove interesting to southern readers. It is allowed that some of the covenants and practices about to be noticed are not altogether faultless; but most of them are, I think, judicious, and favourable alike for proprietor and occupier. The points to which I purpose adverting under this head are: 1st, The duration of tenure; 2nd, The mode of letting farms; 3rd, The usual covenants of leases; and 4th, The rent of land in different parts of the county, with the various modes of payment, &c.

1. Tenancy-at-will, or letting from year to year, is now almost entirely unknown in this county. All parties seem to be thoroughly convinced of its many and serious disadvantages; indeed, I am satisfied that it would be as judicious to induce the present proprietors of Aberdeenshire to let their farms in this way, as to get intelligent tenants to occupy them on such insecure terms. Until within a comparatively recent period, however, life-rent leases were very common in this, as well as in other parts of the country; but being now universally regarded as a bar to improvement, they are rapidly falling into desuetude. Although never granted at present by any landlord, yet they are not likely to become altogether extinct in this county for some time to come, at least not until the demise of the existing holders of such leases. The most simple form of this ancient mode of tenure was a lease for a definite period, and after its expiration during the life of the lessee; but the life of the landlord, or of some other individual, was also occasionally taken. The modifications of the system were very various, but they need not be here adverted to.

All the leases that have been granted for a considerable time past terminate on the expiration of a certain number of years. Some time ago their endurance was commonly much longer than at present, extending not unfrequently to a period of from twenty-three to thirty-three years. Very much of even the low-lying lands of this county was then, however, unenclosed and unimproved; and hence a comparatively long lease was requisite to warrant any considerable outlay of capital by the farmer in executing such costly but essential and useful improvements as fencing, draining, reclaiming, &c.—improvements, too, which generally require a lengthened period to reimburse the necessary expenditure, or to remunerate the tenant. It is almost needless to remark, that in all unimproved districts the lease ought to be considerably longer than the ordinary endurance, as much of it will be expired before the land can be put in proper condition for cropping it systematically. In Aberdeenshire, no lease is now granted for a longer period than either nineteen or twenty-one years and crops; the former term being by far the most general

throughout the county. It is obvious, however, that neither of these periods is of sufficient length to induce or warrant any tenant to expend much of his capital in executing permanent improvements; but the great majority of the landlords now defray the expense of erecting suitable offices, constructing stone dykes, and other fences, &c.; the farmer being required to perform the carriage of the necessary materials gratuitously; and, as shall hereafter be more particularly noticed, a considerable proportion of the cost of draining, reclaiming waste ground, and other expensive undertakings, is likewise borne by the proprietors. The principal exceptions to the periods of nineteen and twenty-one years occur in the vicinity of a few of the burghs, where the proprietors are prohibited from letting their farms for a longer term than five years; but instances of eviction or removal are exceedingly rare, the leases being renewed as long as the tenants continue to fulfil their stipulated engagements. Many of the small heritors of these burgh lands farm the whole of their respective properties themselves.

2. As there exists some peculiarity in the manner of letting or renting farms in Aberdeenshire, it will not be improper to advert briefly to the usual modes of proceeding on such occasions. On some of the larger and best managed estates, such as those of the Earls of Aberdeen and Kintore, it is customary to take an accurate valuation of each farm towards the end of the current lease, whether it is intended to be renewed by the possessing tenant or not. If the farmer, whose lease is about to expire, agree to the rent so fixed by a professional valuator, he continues in possession on a renewed lease; otherwise the farm is advertised to be let, and all who choose may make application for it. From among the candidates who accede to the landlord's terms, he, of course, selects whomsoever he pleases. This is obviously a fair and judicious practice, especially when a valuator of experience and probity is employed to fix the rent, and receives such instructions as those given by the late Earl of Kintore on all similar occasions, which were, "Now remember the maxim—'Live, and let live.'" It is much to be regretted that this system of letting farms is not more general than it is in Aberdeenshire and other districts; the reprehensible custom of inviting competition by public advertisement, and preferring the highest offerer, being still but too prevalent.

According to the latter practice, when the endurance of a lease is within a short period of expiration, and the possessing tenant is either unable or unwilling to effect its renewal, the factor or manager of the estate advertises the farm in the local newspapers, for letting. Candidates come from different localities, and not unfrequently from

the adjoining counties, to inspect the land and offices previous to the day which has been limited for taking in proposals of rent. The landlord thus receives offers up to a specified date from various individuals; and, after consulting with his factor, selects one of the number to be his tenant. If the candidates for a farm are of equal respectability, and all possessed of sufficient capital for the concern, he who offers the highest rent is most generally, but not always chosen, and shortly thereafter the competing parties are duly apprized of the decision. A missive, containing the principal clauses of a lease, with the amount of rent offered and accepted engrossed therein, is then signed by both the landlord and tenant, and forms the basis of their agreement until a regular lease be drawn up. This agreement is, however, as binding on the parties as the lease itself.

Although this latter method of letting farms, viz., by inviting and taking in offers of rent from various individuals, is more or less general throughout Scotland; yet it is certainly, in many respects, highly objectionable. It is true, indeed, that very many of the Aberdeenshire landlords make an offer to the possessing tenant before advertising the farm to be let, and in a subsequent competition he may, if a good farmer, be in some measure preferred to strangers; but it too often happens that he is obliged to occupy precisely the same position as other candidates. Should a higher rent than he feels himself warranted to pay be offered by any unexceptionable person, he, in most cases, loses the farm, however desirous he may be of retaining it on the former terms. But this system of letting is productive of other evils. At the present time, when notwithstanding the loud and universal complaints of the agricultural body, so much anxiety is manifested to obtain farms at almost any hazard, the rent is screwed up to the starving point by such keen competition among the farmers themselves. It is proper, however, to remark, that some at least of the Aberdeenshire proprietors do not invariably accept the highest offer of rent that may be tendered for a vacant farm, if it exceed what they consider the land to be actually worth, from a conviction that the over-rented farmer is frequently unable, however disposed, to do justice to the soil in the way of manuring, &c., and that it conduces ultimately to their own interest to have their farms moderately rented and well cultivated. It is an established, though oft-neglected truism, that the real interests of both landlord and tenant are identical; and hence, whatever tends to paralyze the exertions, to damp the energy, or to shake the confidence of the latter, must of necessity be prejudicial to the interests of the former, as well as to the prosperity and happiness of the nation.

The periods of entering farms throughout Scotland are at the terms of Whitsunday and Martinmas; the former being by far the more common, though in general it is rather an inconvenient season for taking possession. When the in-coming tenant has a free right to the new grass, straw, and dung of the last year of the lease, an entrance at Whitsunday is perhaps unobjectionable, otherwise a Martinmas entry is considered to be more suitable to the tenant, and more agreeable to all parties concerned. When the former term is adopted, possession is given of the houses and all the grass, except that of the preceding year's sowing at Whitsunday, and of the cultivated land at the separation of that year's crop from the ground.

3. On most of the larger estates, regulations for general management and cropping are printed, and a copy is furnished to any person that becomes a candidate for a vacant farm, so that none may be ignorant of the conditions of lease before tendering his offer. Strict conformity to the rules and customs of the estate is commonly required of all; but sometimes a tenant entering on a new lease may succeed in obtaining a modification of some objectionable covenant, or he may secure more favourable stipulations in regard to the allowances for draining and other improvements. The farm-buildings may need some essential repairs or additions; new fences may be necessary; the roads through the farm may require to be extended or improved, &c.; all of which, of course, constitute objects of negotiation between the parties preparatory to the lease being drawn up and signed. The restrictive clauses in Aberdeenshire leases are not very numerous; and, as referring chiefly to the last few years, when the tenant becomes less interested than previously in the adequate manuring and tillage of his land, they cannot be regarded as objectionable, and do not by any means operate as a bar to the introduction and adoption of useful improvements. Proprietors in general now appear to be impressed with the fact, that whatever tends to deter the tenant from expending his capital and exercising his skill and industry in the cultivation and improvement of his farm, must, at no distant period, operate prejudicially to their own interest, as well as to that of the nation at large. Hence, comparatively few of the tenantry in this district are fettered with absurd or unnecessary restrictions, or burdened with vexatious obligations, at least not nearly to the extent complained of in other quarters.

The management of most of the estates being conducted on the same general principles, there exists a considerable degree of uniformity in the terms and covenants of the leases granted by different proprietors; but, as already observed, neces-

sary modifications of the usual conditions are not unfrequently allowed in peculiar instances. I shall now give an epitome of the usual clauses in Aberdeenshire leases, the principal of which are those that relate to the landlord's privileges or reservations, the time and mode of paying the stipulated rent, the cropping and general improvement of the farm, the buildings and fences, and the arrangements between the in-coming and the out-going tenant.

It is customary for the proprietor to reserve to himself, by a clause in the lease, all stone-quarries, mines, metals, marls, or other minerals found within the grounds, with power to search for, work, and remove the same, paying the occupier surface damage only. Power is also reserved, without the consent of the tenant, to take ground, as well as the necessary materials, for forming new roads, large drains or watercourses, and to widen, shut up, or alter the existing ones; allowing compensation for the surface damage of the season only in which these operations may be performed. The landlord further reserves power to straighten "marches" or meerings, and for that purpose to "excamb" or exchange land with any contiguous proprietor or tenant, on compensation being made to the tenant for any land thereby taken away, or additional rent received from him for land thus annexed to the farm. Power is likewise reserved to plant trees on any ground that may be considered by the landlord to be unfit for tillage, on enclosing the same, and allowing deduction of rent for the portion of land so occupied. The amount of compensation, in either of the foregoing cases, is estimated by two competent persons, mutually chosen. Reservation is likewise made by the proprietor of the whole of the game of every kind, as also of the fish in the rivers and "burns" (rivulets) within his estate; with power to himself, and others having his permission, to hunt, shoot, or enjoy the same in the most ample manner; the tenants not only being prohibited from shooting or killing game themselves, but expressly bound by their leases to inform against all trespassers, and, as far as they can, to protect the game. This obligation is very general throughout this county; though there are a few exceptions, as some proprietors now allow their tenants to shoot the redundant game on their respective farms.

Formerly, it was a general custom for tenants to furnish, annually, in addition to their rent, a certain number of poultry of different kinds, and also to deliver a stipulated quantity of coals at their landlord's residence; but these antiquated obligations, though not altogether extinct on some estates, are very properly becoming obsolete throughout Aberdeenshire. Tenants are still, however, in many

instances, obliged to perform gratuitously a certain amount of carriages to the proprietor's dwelling-house and offices, to the minister's manse and offices, and also to the parish church and school-house, whenever called upon to do so. In all the old leases the tenants were "thirled" to the grain-mills to which their respective farms had been by long use astricted, and obliged to pay "multures, mill-dues, and mill-services, according to previous use and wont." By this absurd regulation, the farmer was bound to give the miller a fixed, and by no means an insignificant proportion of the whole grain annually grown by him, without reference to the quantity of meal he may require manufactured, and was not exempt by getting his corn ground elsewhere; but the thirlage system, which until a recent period was very generally established throughout the whole of Scotland, is now almost entirely abolished, or greatly modified in Aberdeenshire.

Every tenant is bound to personal residence on his farm; subletting the whole or any portion of the lands is strictly prohibited; and all assignees (whether legal or voluntary) are expressly excluded. Heirs-portioners are also excluded; but a tenant having children may appoint one or more of his sons, or one of his daughters, to succeed him in his lease. The clause prohibiting the sub-letting of land does not in general prevent the tenant from accommodating a few of his regularly employed servants with cottages and attached gardens, but the number is in many cases limited.

The candidate for a vacant farm is commonly required to accompany his offer with a letter from one or two of his friends, pledging themselves that, should he be chosen, the first year's rent shall be duly paid, and the farm be fully cropped and stocked at the outset. The tenant himself is bound to keep the lands at all times sufficiently stocked during the currency of his lease.

But perhaps the principal clauses are those that relate to the cropping and management of the farm. The tenant is always bound to cultivate his land according to the most improved system of husbandry, and to leave it in good heart and condition at the expiration of the lease. It is obvious that this rather indefinite obligation allows the most perfect liberty to the intelligent farmer to adopt every well-authenticated improvement, as well as to cultivate his crops in whatever manner he finds from experience to be best adapted to the nature and situation of his land; while it is sufficiently explicit and stringent to prevent the unskilful or the unprincipled tenant from mismanaging, exhausting, or over-cropping his land. The tenant is further obliged to consume, with cattle on the farm, the whole of the turnips and straw raised thereon, ex-

cept the straw of the last or away-going crop, and to apply to the ground all the dung made on the farm, none of it being on any account allowed to be sold or removed off the lands; the hay and potato crops are, however, usually permitted to be disposed of. On some estates the tenants are still prohibited from growing flax oftener than once during a nineteen years' lease, from an apprehension that that valuable plant is exceedingly exhausting to the soil—an opinion which is now, however, ascertained to be destitute of foundation, when the crop is cultivated according to the most approved system.

Although every tenant is enjoined by the terms of his lease to practise some rotation of cropping, yet on many estates he is not restricted to any particular course at the outset. The choice of either of two or three different shifts is not unfrequently allowed him at the beginning of the lease; but to the one which is then decided upon he is obliged afterwards to adhere. Until within a recent period, the tenant's choice was restricted to the five and seven course rotations (which are those most commonly practised in this county), and he is usually allowed three years, after entering on the farm, to determine which course of cropping is likely to be the most eligible. Due notice of such decision must be given to the proprietor, or his factor, prior to a specified date, otherwise the landlord considers himself entitled to fix the rotation; and whatever one may be so fixed, the tenant is bound to adopt and adhere to it during the remaining years of the lease. The six-course shift has recently been introduced, and being regarded by all intelligent agriculturists as best adapted to the soil of which the greater part of this county is composed, and most agreeable to the principles of correct husbandry, it bids fair to supersede the above rotations at no distant period. When either the five or the six-course shift is adopted, the tenant is strictly prohibited from growing two corn or white crops in succession on the same land—a restriction which is acknowledged by all to be as advantageous to the farmer himself, as it is in most cases essential to the maintenance of the land in proper condition. In the seven-course rotation, however, the tenant is permitted to grow two grain crops in succession after three years' grass. This is, undoubtedly, an impolitic allowance, but one of which not a few farmers are disposed to avail themselves. Its injurious effects are more or less apparent in every district in which the seven-course shift is pursued, as the difficulty experienced in adequately cleansing the ground for turnips, or other green crop, involves more expense and labour than most farmers are willing to incur, in consequence of the facility afforded to the growth of couch-grass (*Triticum repens*), and

other root weeds, by the second year's oat crop. The land is thus infested with weeds during the whole of the rotation, not to mention the necessary exhaustion of the soil by growing two corn crops without an intervening green or restorative crop.

On farms containing a proportion of "outfield" as well as of "infield" land, the tenants are usually required to follow a different rotation on each. The following is an abstract of the article relating to this subject, in the printed condition of leases on an extensive estate:—

"On all outfield land the following rotation of cropping and managing the same shall be observed:—The dung and manure annually made and collected on the farm shall be laid on land that has carried a crop of grain the preceding year, the same being always timously and properly fallowed, cleaned, and prepared (and limed when necessary) for raising turnips and other green crops; or, failing there be sufficient dung, the land shall be summer fallowed; after which green crop or fallow, a crop of grain may be taken, sown out with good and sufficient clover and perennial rye-grass seed; and thereafter, the land shall remain at least three years in grass, the first of which only to be cut for hay, and the remaining years pastured. In case the grass be not cut, but pastured the first two years after being sown out, the land may be broken up after two years' grass; but in any case when broken up, only one grain crop to be taken; after which, the land is again to be dunged, cleaned, and dressed for green crop, or summer fallowed. On infield land, this rotation may be altered so far only as that two grain crops may be taken in succession when the land is broken up after three or more years' grass. The tenant is to observe strictly the above rotation of cropping during the whole lease, otherwise to pay £4 per acre of additional rent for any land cropped otherwise any year, and which, in such case, shall be immediately exigible."

Although the great majority of the Aberdeenshire landlords appear disinclined to impose severe or unjust restrictions on their tenantry, further than is considered necessary to prevent them from mis-cropping or injuring the land during the last few years of the lease, yet, in binding a tenant strictly to adhere to a particular rotation of cropping, after such has been decided upon, a loss is sometimes sustained by him. For example: should the perennial rye-grass seeds, sown along with the first grain crop in the rotation for hay and pasture, turn out to have been spurious or annual (as has not unfrequently occurred in this district of late years, to the vexatious disappointment and loss of many farmers), the tenant is not, in most cases, permitted to break up the land till the regular period it should be in grass has expired, although the pasturage

may be almost entirely worthless after the first year.

Some diversity of practice exists in reference to the farm-buildings. The most approved arrangement, however, is for the proprietor to put the dwelling-house and offices in suitable condition, by means of repairs, or any requisite additions, and to deliver them over to the tenant at "Inventory and Valuation;" the valuation to be made by competent tradesmen mutually chosen. In this case the tenant is not called upon for any payment at the period of entry on account of the buildings, but is bound to maintain during the currency, and leave, at the expiration of his lease, the whole houses on the farm worth their appraised value at the commencement. Should the tenant, on his removal from the farm, leave the buildings of greater value than when he entered into possession, or should he, with the proprietor's approval and consent, have erected any additional offices, he is entitled to compensation for "meliorations." On the other hand, if the houses at the term of removal fall short of the value put upon them at the beginning of the lease, either the landlord or the in-coming tenant has a claim against the out-going tenant to the extent of such deterioration. I may remark, that the foregoing arrangement has given much satisfaction, and is becoming general throughout this county. On several estates the houses and buildings on the respective farms are erected wholly at the proprietor's expense, the tenants being bound to perform the carriage of the necessary materials. In general, no allowance is given to tenants for additional buildings erected by them during the currency of their leases, or for improvements on the existing offices, unless special consent for effecting such additions or repairs has previously been obtained. Many proprietors now require that the houses on each farm be insured against fire for their full value during the lease, and at the tenant's expense. Conditions similar to the preceding bind the tenants on most estates to maintain the stone-dykes and other fences upon their respective farms in a proper state of repair, compensation being allowed at the expiration of their leases for such as may have been constructed on lines approved of by the proprietor, and at their own expense.

Every lease includes one or more clauses intended to facilitate the arrangements, and to prevent dispute between the out-going and the in-coming tenant. Expensive and unpleasant litigation has not unfrequently arisen between these parties, in consequence, chiefly, of their respective obligations not having been definitely specified in the lease. Most proprietors are now, however, sufficiently strict in regard to the cropping and management of the

farms on their estates for a few years previous to the term of removal, in order that the lands may be transferred undeteriorated to the in-coming tenants; and that the proper proportion of grass of different ages, and of fallowed or manured ground, &c., be left for their use. The particular number of acres stipulated to be in grass, or to be appropriated as a fallow-break for green crop at the expiration of the lease, depends of course on the extent of the farm, and the rotation of cropping pursued. The in-coming tenant has in most cases to pay his predecessor for all the new or first year's grass, as also for the proportion of turnip ground, and for ploughing or otherwise working the latter; he has likewise to take at valuation all the dung that has been made on the farm during the autumn, winter, and spring preceding the term of removal; and on leaving the stipulated proportion of grass and of turnip land at the end of his lease, he becomes entitled to similar allowances from his successor. The proprietor usually reserves power either to himself or to the in-coming tenant to sow clover and rye-grass seeds with that portion of the last grain crop which is grown on land intended to be sown down to grass, the out-going tenant being bound to harrow and roll in the same. The in-coming tenant occasionally is obliged to take over from his predecessor, at a valuation, the threshing-machine, with its usual appendages; and the landlord or the next tenant is bound in like manner to take the same off his hands at the period of his removal, if left in good working condition. Either the proprietor or the in-coming tenant has a right to take the whole or any portion of the last or away-going crop at a valuation; but neither of them is bound to do so if disinclined. In the latter case the crop is disposed of by public roup (or auction) some time before harvest.

The instances are very few in which the in-coming tenant has a right, without purchase, to the straw and dung on the farm at the period of entry, as is now the established custom in many parts of the south of Scotland. In the Lothians, for example, the dung and straw very frequently descend *free* to the new tenant, both commodities being the property of the landlord, and held by him in *steelbow*. This practice is eminently deserving of being more generally adopted than it is. A sufficiency of manure, and of the materials for its formation, are thus permanently retained on the farm, which is obviously a most valuable boon to the in-coming tenant, as being in effect equivalent to his possessing as much more capital on his entry to the farm as the straw and dung he receives are worth; besides, when the out-going tenant expects that all the dung he accumulates will be purchased by his successor, he is naturally more mindful of

augmenting its quantity than of attending to its quality; and it is hardly necessary to remark that one cart-load of good farm-yard dung is more valuable to the farmer than twice the bulk of an inferior article. The "steelbow" system may easily be adopted in any other quarter of the kingdom as well as in the southern Scotch counties, by having the proprietors purchase the straw and dung from their tenants on removal, for the purpose of delivering them over gratuitously to the succeeding occupiers of the same farms. This useful practice is, at length, beginning to find its way into Aberdeenshire.

As the subject of tenure is now engaging a good deal of public attention, it is hoped no apology is necessary for having dwelt so minutely on the system of leases which is established in this part of the country. Besides the covenants to which I have adverted in the preceding pages, every lease contains a few others; but being of a local nature, and not interesting to general readers, I shall omit further reference to them in this place.

It may not be improper to conclude this account, or summary of the Aberdeenshire leases, with a few observations on the amount of encouragement which is commonly given to tenants for executing useful and permanent improvements on their farms. The allowances for these purposes vary on different estates. As has been already observed, "mellorations" for repairing or extending the farm-buildings are never allowed the tenant till the period of his removal from the farm, and he then receives compensation according to the valuation of two persons mutually appointed. On most of the estates in this county, the proprietors defray the whole expense of erecting new offices, except the carriage of the materials; but on some others, such as those of the Earls of Aberdeen and Errol, the tenants have to erect and keep in repair all the houses on their respective farms, a half-year's rent being allowed for the same at the end of the lease; slates and stones are, however, I understand, given free of expense by both those excellent landlords. The allowance for constructing new stone dykes and other fences, on lines sanctioned by the proprietors, is generally regulated in the same manner as that for buildings. Their value is ascertained by two persons mutually chosen; but in most instances the allowance for dry stone fences does not exceed sixpence per lineal or running yard.

There are few counties in Scotland that stand so much in need of draining, or in which that fundamental improvement is now so vigorously carried on, as Aberdeenshire. The proprietors, in general, are daily becoming more alive to its vast importance to themselves, to their tenantry, and to the nation at large. For necessary drainage, performed to the pro-

prietor's satisfaction, the tenant usually receives a considerable proportion of the expense while the operation is being executed, or, at least, immediately after its completion. It is customary for some landlords to defray the cost of cutting or opening the drains, the tenant being obliged at his own expense to cart the material employed in filling, and to finish the work in a proper manner. Other proprietors, again, allow their tenants to disburse the entire cost of the drainage in the first place, and at the next payment of rent they are refunded a certain proportion of the expenditure—generally from one-half to three-fourths of the outlay, according to previous agreement.* This is a very common practice. Another arrangement, which is becoming general in Aberdeenshire, deserves to be noticed in this place, as it has uniformly given much satisfaction. According to this plan, the landlord executes the drainage required on each farm entirely at his own expense, except the cartage of the stones used in filling the drains, and charges the tenant a certain per centage (generally five per cent. per annum) during the remaining years of the lease, on the money thus expended. This is unquestionably a most judicious practice, and one which is well calculated to benefit both landlord and tenant. The former, who may be said to possess a permanent interest in the land, and to whom its drainage eventually becomes more advantageous, is thus enabled to get this, in most cases, essential and highly remunerative operation substantially and efficiently executed; whereas, when the whole or greater portion of the expense is borne by the tenant, it would obviously be unreasonable to interfere with his mode of accomplishing the work, which will naturally be the most economical he can devise. Again, to the tenant who has just entered on the occupancy of a farm requiring much drainage, such an arrangement as that under consideration is of unquestionable utility. Draining, though the primary operation on all wet soils, is by no means the only source of more than ordinary outlay, which a tenant is called upon to meet during the first few years of his lease. It is not uncommon, even in well-cultivated districts, to enter on a farm more or less infested with weeds, and not in the highest state of fertility; hence the necessary cleansing of the ground for green crops, and the application of enriching manures, demand no inconsiderable expenditure at the very outset, in addition to the claims of the preceding tenant.

* On one estate, with the management of which the writer is particularly acquainted, the tenants are allowed 12s. 6d. per hundred yards for small drains, and 16s. 8d. for main drains executed on the Deanston plan, which nearly covers the whole expense of cutting and filling.

A similar arrangement is occasionally agreed to by proprietors and tenants for trenching, or otherwise reclaiming waste ground, of which a very large proportion of this county consists; but this species of improvement is frequently effected piece-meal by the farmers, as favourable opportunities occur, on the condition of paying for the land so reclaimed only a nominal or very insignificant rent during the unexpired period of their leases. Of course, such costly undertakings are commenced as early as possible after the farms have been entered upon. In a subsequent article I shall give some account of the various methods, as well as the results of reclaiming the unproductive, or rather hitherto neglected wastes, with which this county abounds. There is hardly any farm that has not some portion of waste ground attached to it.

4. Having thus adverted to the usual covenants in Aberdeenshire leases, I now proceed to consider the rent of land in different parts of the county, and also the public and parochial burdens generally borne by the farmers.

The soil being, as stated in a preceding article, exceedingly diversified in character and quality, the rent is consequently very unequal in different localities; it varies, of course, with the situation and productive capabilities of the land. The mountain pastures are let at a merely nominal rent, a right of grazing upon them being, in most cases, enjoyed in common by all those who possess arable land in the neighbourhood under the same proprietor. Many thousand acres of bog, moor, and mountain do not bring a shilling of rental to the owners. The better description of moorish ground interspersed throughout the lower parts of the county, and which afford a rough pasturage to cattle and sheep during the summer months, lets at from sixpence to one shilling and sixpence per acre. The rent of arable land varies very much with its situation: in the immediate vicinity of Aberdeen, where the productive powers of the soil have been vastly augmented by means of trenching and spade cultivation, coupled with the facility of obtaining at all times an abundance of excellent street manure, the rent is of course high. The holdings are of the smallest size (varying from one to ten acres), and are occupied principally by tradesmen and market-gardeners. The rent of these patches varies from £3 to £7 per acre, according to their quality and proximity to the city; and where the ground is suitable for and appropriated as nurseries and vegetable gardens, it is not uncommon to pay from £8 to £14 per Scotch acre. In the vicinity of the burghs of Kintore and Inverury, where a number of small holdings also exist, the rent varies from £2 10s. to £4 per acre. The rent of the best land in the neighbourhood of Old Meldrum is £4 10s.; that of

inferior quality from £3 to £3 10s. per Scotch acre. In the vicinity of the town of Peterhead, in the peninsula of Buchan, the rent of land varies from £2 to £6 per acre, according to quality and situation. It is to be recollected that by far the greater number of holdings in the neighbourhood of these towns are of very limited extent, and that small possessions are always proportionably higher rented than large farms.

In order to enable my readers to form some idea of the amount of rent paid by Aberdeenshire farmers, I shall here give a statement of the average rent per acre of the arable land in a few parishes in each division of the county, which is compiled from the "New Statistical Account," the writers of which had access to the most authentic sources of information. The rents given according to the Scotch measure I have reduced to their equivalents per statute acre in the subjoined statement:—

		MAR.	
Parish of	Strathdon	£0	19 0
" "	Alford	0	15 0*
" "	Aboyne	1	2 6
" "	Kildrummy	0	19 0
" "	Monymusk	0	14 0
" "	Midmar	0	19 0
" "	Kincardine O'Neil	0	16 0
" "	Skene	0	15 0
" "	Peter Culter	1	0 6
		FORMARTIN.	
Parish of	Fintray	£0	17 0
" "	Tarves	0	15 0
" "	Newmachar	0	16 0
" "	Belhelvie	1	10 0
" "	Udny	0	19 0
" "	Auchterless	0	15 0
		BUCHAN.	
Parish of	St. Fergus	£0	18 0
" "	Old Deer	0	19 0
" "	Aberdour	0	15 0
" "	Longside	0	13 0
" "	Logie Buchan	0	12 0
" "	Crimond	0	17 0
" "	King Edward	0	13 0
" "	Slains, from £1 to	4	0 0
		STRATHBOGIE.	
Parish of	Drumblade	£0	15 0
" "	Rynie	0	12 0
" "	Forgue	0	11 0
" "	Huntly	2	12 6
		GARIOCH.	
Parish of	Insch	0	15 0
" "	Culsamond	1	2 0
Parish of	Chapel of Garioch, "infield" land, £1 to £1 18s.; "outfield," 6s. to 12s.		
Parish of	Oyne, infield land, £1 10s. to £2 5s.; outfield, 8s. to 15s.		
Parish of	Rayne, infield land, £1 10s.; outfield, 9s. to 18s.		

* A considerable proportion of the land in the Vale of Alford is let at from £1 10s. to £2 10s. per acre.

Parish of Bremney, infield land, £1 10s. to £1 18s.; outfield, 15s.

I shall only observe further under this head, that the valued rent of Aberdeenshire is £235,665 8s. 11d. The annual value of real property, as assessed in 1815, was £325,218; and in 1843, £603,968.

The public and parochial burdens borne by Aberdeenshire, in common with other Scotch farmers, are income-tax, window-tax, commutation road-money, schoolmaster's salary, poor-rates, &c. Owing to the prevalence of small holdings, many of the farmers are wholly exempt from some of these imposts. Until very recently the Scottish paupers were supported by voluntary contributions at the church doors; and where these were inadequate, an assessment was laid on the proprietors and tenants, who paid equal portions. There are very few parishes in this county in which an assessment was required for the support of its poor. As the new poor-law has not yet fairly come into operation, the farmers are still uncertain of what they may have to pay. The commutation road-money varies from twopence to eightpence in the pound of rent. The subjoined statement of the sums actually paid for a farm of 300 acres, whose annual rental is about £430, will illustrate the preceding remarks.

Income-tax	£4	9	7
Window-tax	3	9	0
Road-money	1	5	0
Riding-horse	1	8	9
Schoolmaster's salary	1	5	0

£11 17 4

Rents are paid either wholly in money to an amount agreed upon at the beginning, and fixed during the currency of the lease, or partly in money and partly in grain or meal computed by the fiars-prices of the county. It appears that this mixed mode of payment has been practised to a greater or lesser extent in this county from a very remote period. In most of the old, and in many of the modern leases, it is stipulated that "the meal and bear rent is to be paid betwixt Christmas and Candlemas, all next after reaping the crop; and the victual to be transported by the tenant, at his own expense, when required, to Aberdeen, or any place of sale the same distance. The meal to be of clean, great oats, free of fault; the bear sound, well dressed, and marketable." This mode of payment is still very common in Aberdeenshire. The grain-rent system was, at one period, very popular in this county, and, indeed, is so still in many parts of it, as being the most secure and equitable for the tenant in the majority of years. Nevertheless, the practice of paying rent wholly in grain, or rather its price computed by the annual county fiars, is falling into disrepute among many intelligent agri-

culturists. Although a rent fluctuating with the price of farm produce is unquestionably the most beneficial to the tenant in the majority of seasons, when properly regulated and fairly determined, yet the system is certainly open to some weighty objections under its present defective arrangement. Besides, a rent exclusively dependent on the varying price of grain is obviously inapplicable to this county, where the rearing and fattening of live stock is so extensively pursued. Aberdeenshire, as is well known, is one of the principal grazing and cattle-exporting counties, and on many farms the greater portion of the tenant's income is derived from this source; hence it is manifest that, in a "produce-rent" adjusted on equitable principles, the price of cattle or of beef should constitute an element as well as that of bear or oats, which at present is not the case; nor is it very likely to be so for some time to come, owing to the supposed impracticability of striking the annual average price of live stock. Until, therefore, some arrangement be adopted for ascertaining and including the price of the animals reared or fattened on the produce of the farm, as well as that of the grain disposed of in the market, the mode of adjusting rent under consideration cannot be regarded as strictly equitable, or generally beneficial to the majority of tenants in Aberdeenshire.

Again, when grain alone forms the basis of the rent, the farmer is not unfrequently obliged to pay most when he is least able to do so, as when prices are high in consequence of diminished production or unfavourable harvests; on such occasions, too, the proprietor's rent-roll is unduly magnified at a time when his tenants and the community may be suffering unusual privations. These observations in reference to the disadvantages of an exclusively grain-rent are peculiarly applicable to the upland parts of the county, where the harvest is often exceedingly precarious, owing to the coldness and humidity of the climate, and the liability of the corn to be seriously injured by early frosts. It is manifest that a rent regulated by the annual fiar-prices would sometimes be ruinous to the farmers in the higher districts of such a mountainous county as Aberdeen. A *maximum* and a *minimum* price are now frequently agreed upon for the particular grain payable as rent, a practice which has been found of great utility to both landlord and tenant, and has gone far to obviate some of the disadvantages alluded to, as protecting the proprietor in years of unusual abundance and low prices from the unpleasant consequences of an undue reduction of his receipts, and the tenant from an oppressively high rent in seasons of scarcity. Most farmers, especially in the low parts of the county, seem to prefer a mixed rent, viz., about one-half in

money, to a fixed amount, and the remainder in oats or bear, or both grains conjointly; which, when fair maximum and minimum prices are determined on, is considered to be more beneficial than any other mode of payment yet devised, taking one year with another. The maximum for oats varies on different estates from 22s. to 25s. per quarter, the minimum from 17s. to 19s. per quarter; for bear the maximum is commonly 28s., the minimum 24s. per quarter, according to agreement.

Rents are paid in two equal moieties at the terms of Candlemas and Lammas; but sometimes also at those of Whitsunday and Martinmas. The former

are undoubtedly the most favourable terms for the tenant, and are accordingly by far the most general.

The fiars-prices, to which allusion has already been made, are "struck" or ascertained during the first week in March, which is certainly too early, as only a limited portion of the crop is disposed of before that period. This has long formed a ground of complaint by farmers whose rental is regulated by the fiars-prices. They are ascertained by the sheriff of the county, and a jury composed of proprietors, farmers, and corn dealers.

Subjoined is a statement of the Aberdeenshire Fiars-prices for the last six years, and crops:—

CROP.	1840	1841	1842	1843	1844	1845	Average.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Grain, per Imp. Qr.							
Oat-meal, per boll of 140 lbs.							
Wheat, with fodder	— —	— —	— —	57 0	— —	60 0	— —
Do. without do.	— —	— —	— —	48 0	— —	— —	— —
Barley, with fodder	29 0	36 0	33 0	35 0	33 0	32 6	33 1
Do. without do.	25 0	27 0	25 0	29 0	27 3	27 0	26 8½
Bear (farm or market) with fodder	28 0	33 6	30 6	32 6	31 0	30 9	31 0½
Do. do. do. without do.	24 0	24 6	22 6	26 9	25 3	25 3	24 8½
Oats 1st, with fodder	26 0	29 4	26 6	25 8	24 0	28 3	26 7½
Do. do. without do.	21 0	18 4	16 6	18 6	18 3	22 6	19 2½
Do. 2nd with fodder	24 6	28 0	25 0	24 0	23 0	27 3	25 3½
Do. do. without do.	19 6	17 0	15 0	16 10	17 3	21 6	17 10½
Beans	32 0	29 0	24 0	25 10	—	30 0	28 2
Peas	32 0	28 3	23 0	25 10	—	30 0	27 9½
Malt (duty included)	— —	51 2	43 9	48 0	49 6	— —	48 1¼
Oatmeal, 140 lbs.	15 0	15 0	11 9	13 0	14 4	18 6	14 7½

T. S.

EXPERIMENT ON THE ACTION OF DUNG, AND OF SOME ARTIFICIAL MANURES, UPON BEET-ROOT.

By PH. PUSEY, M.P.

Being desirous to try the comparative effects of certain manures for my own guidance, I made an experiment upon 5 acres of mangold-wurzel—or beet-root, as it would be more convenient to call that root. There were several questions to which it seemed to me that the answers, if I could obtain them, would be interesting, and might be useful. To what degree, for instance, one may increase the dressing of dung, with corresponding benefit to the crop, and what is the limit beyond which an increased quantity of dung ceases to act, or again, whether it be better to dress with dung only, or with a combination of dung and of artificial manure. The latter question is the more practical, because some writers maintain that a farm ought to supply its own manure, and that the purchase of artificial aids is a proof of imperfect management. In order to investigate these and other points, I applied to 5 acres of yellow globe beet-root,

in the first week of April, different dressings at the following amounts per acre:—

- | | Dung. | Artificial Manure. |
|--------|------------------------|---------------------|
| Lot 1. | 26 loads of good dung. | |
| 2. | 13 ditto ditto. | |
| 3. | 13 ditto and . . | 7 cwt. rape-dust. |
| 4. | 13 ditto and . . | 14 bush. bones. |
| 5. | 13 ditto and . . | 7½ cwt. rags. |
| 6. | 13 ditto and . . | 3 cwt. guano. |
| 7. | | 7 cwt. rape-dust. |
| 8. | | 14 bush. bone-dust. |
| 9. | | 3 cwt. guano. |
| 10. | No manure. | |

Having found that when manures are tried by being spread upon distinct portions of the same field, some uncertainty is cast upon the result by differences in the crop, which evidently do not arise from the action of the respective manures, but from variation in the depth or quality of the soil,

from previous manurings, from the deprecation of insects, or some cause that cannot be detected, I apportioned the manures to be tried in a new method, which increased the trouble indeed, but which I thought would make the result trustworthy. The rows were opened 3 feet apart upon the whole piece. In the three rows I put the heavy dressing of dung; in the next two rows, the lighter dressing; in the two following rows we added rape-dust to the dung; and so on until, in 19 ridges, all the trials had been prepared. We then began again as before with the heavy dressing of dung and completed another set of 19 ridges like the first. The extent of 5 acres allowed 6 sets thus to be made; which might be regarded as six repetitions of the same experiment, and as therefore deserving greater confidence. Thus the rows which received artificial manure only, of whatever kind, were of a darker green than the rest until some hot weather came in August. Their leaves then blistered, and many of the leaves withered suddenly off. If this had occurred on one patch of ground only, it might have been imputed to accident; but no one who saw it repeated on these particular rows, in six different stripes across the field, could doubt that it was caused by the absence of dung, which on such sandy land thus appears necessary for carrying a crop through to harvest. The land, as I have said, was very light, being in part a shifting sand, so that in one part the seed was blown out of the ground; but the dripping summer was favourable, and the crop was a very good one.

At the end of October the roots were taken up, and the produce ascertained by weighing the yield of half an acre, measured across the six sets of rows at one end. The yield was as follows:—

No.	Dung.	Artificial Manure.	Tons of cleaned Roots, per Acre.
1.	26 loads	.	28½
2.	13 loads	.	27½
3.	13 loads	7 cwt. rape-dust.	27
4.	13 loads	14 bush. bone dust	26
5.	13 loads	7 cwt. rags	36
6.	13 loads	3 cwt. guano	36
7.	.	7 cwt. rape	20½
8.	.	14 bush. bones	20
9.	.	3 cwt. guano	20½
10.	.	.	15½

By comparing the two first lots, it appears that in doubling the dose of dung we had gained only 1 ton per acre, which is in fact gaining nothing. It is proved, therefore, that on some land, though poor, if in high condition, there is a point beyond which even a large increase of mere dung ceases to act. But the clearest mode of examining the result of the trial will be to divide the lots into classes, according to the amount of produce, and it will be

found that they fall easily into classes—an agreement which can hardly be accidental, and leads to the belief that some uniform cause have been at work.

First we must of course take the soil in its actual state, not its natural state, for it is naturally poor, but in its then state of productiveness as it stood without further assistance.

Soil unmanured 15½ tons of field-beet. This will of course form the standard by which to judge the effect of the other manures. The artificial manures evidently follow next, their produce running very even. Rags used singly were accidentally omitted from the trial, but having used them in the same field and seen their yield, I should put them at the same amount with the rest.

The second class then will stand thus:

ARTIFICIAL MANURES ALONE.

	Tons.
7 cwt. rape	20½
14 bushels bones.	20
3 cwt. guano	20½
7 cwt. rags, (estimated) about	20

The agreement, by actual weighing, between the three first artificial manures is very close. The effect of all is but weak, and the increase of crop would barely pay for their use, being only 5 tons, worth 50s. to consume on the land.

The third class evidently marks itself out as follows:—

Artificial Manure	Tons.
13 loads dung	27½
13 loads dung . 7 cwt. rape-dust	27
13 loads dung . 14 bushels bones	26
26 loads dung	28½

These amounts again may be taken as practically the same. No advantage is gained by exceeding the single dressing of dung. It seems a confirmation of the inference that there is a limit to the profitable use of dung, to find that bones and rape-dust, each efficient when used alone, fail equally with the additional dose of dung in raising the produce above the standard amount, in which there certainly is a striking agreement between the four lots. In the second class, then, the artificial manures gave each about 5 tons additional produce per acre. In the third class, the single dressing of dung give about 12 tons, which is not increased by the further use of bones, rape, or sensibly even by doubling the dung.

The remaining class shows a different result:—

13 loads of dung	7 cwt. rags	36 tons
13 loads of dung	3 cwt. guano	36 tons

Here we obtain a very large increase by adding two different artificial manures separately to the full dose of dung. The question arises, why these two

manures should act so much better ; a question I am unable to answer. But in the interesting work on "Rural Economy," which Boussingault has lately published, and Mr. Law has translated, there is a very copious table in which the value of manures is stated according to the quantity of azote which they contain. In that table the manures we are now dealing with stand thus :—

	Azote.
Rape-dust	5½
Bones	6½
Best guano	15¾
Woollen rags	20¼

Possibly therefore a chemist might find the answer in this superabundance of azote, but I am not competent to say how this may be. In fact the two leaders in agricultural chemistry, Leibig, and Boussingault, are at variance on this very point. The two principal results of the experiment seem to be—one, that there is on some soils a limit beyond which an additional dose of dung is of no use. This result, if confirmed, would be interesting in theory. In actual farming there is not much danger of our erring in that direction, as to our dressings of dung; and in some parts of the country

this would not, perhaps, be a very safe doctrine to dwell upon. The other inference, a more practical one, is that it is more profitable to use some artificial manures in conjunction with dung, than to use either singly. Thus guano and woollen rags used singly, added to my crop only 5 tons per acre. The single dressing of dung added only 11 tons, and doubling that amount of dung did no good; but guano combined with the same amount of dung, and rags combined with the same amount of dung, each gave an addition not of 16 tons of roots, according to their effects when used singly, but of 20 tons, yielding each 36 tons, a produce very large indeed for land which, four years ago when I took it in hand, was said to be incapable of growing a turnip. I will only add, that I am not insensible to the risk, in drawing general rules, from single experiments, however carefully made; but as this experiment was a careful one, I state what appear to me to be the legitimate inferences from it, in the hope that they may be confirmed or refuted by other observers, so that at last the truth may be known.—*Journal of the Royal Agricultural Society.*

Pusey, November 24, 1845.

THE COMPOSITION OF ORGANIC MANURES.

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

THEIR GASES—OXYGEN.

(Continued.)

In a former section of this paper I have given a few facts which relate to the organic part of manures; intending by that term the portion of fertilizers which is, by the effects of decomposition, reduced to the state of gases.

Having already spoken of those whose principal value consists in their nitrogen and hydrogen, I now proceed to the examination of that portion of the organic fertilizer which is composed of oxygen. Entering as oxygen gas does so extensively into the composition of all animal and vegetable substances, it of necessity is present in the various organic fertilizers. Thus, of vegetable matter found in the manure of the farm-yard, 1,000 parts of the following substances contain of oxygen gas

Clover hay	389 parts.
Clover seed	350
Oats	367
Peas	401
Wheat	431
Potatoes	439

It constitutes of	Gluten	- -	15.70 per cent.
"	Starch	- -	49.
"	Sugar	- -	50.63
"	Gum	- -	50.84
"	Bees' wax	-	5.544
"	Woody fibre		41.78
"	Acetic acid	-	46.82
"	Oxalic acid	-	66.534
"	Tartaric acid		59.882
"	Citric acid	-	54.831
"	Benzoic acid	-	20.43
"	Gallic acid	-	38.36
"	Olive oil	-	9.43
"	Train oil	-	15.03
"	Gelatine	-	27.4

Forming, therefore, so essential and so considerable a portion of all vegetable substances, it would be reasonable to conclude, even before we appealed to the Chemist's magic assistance, that the oxygen of the atmospheric air contained in the earth, afforded a portion of the supply. It is certain, in fact, that whenever even the seeds of plants begin to vegetate,

that they absorb oxygen from the atmosphere in which they are placed; and as I have elsewhere observed, this essential use of oxygen gas to vegetation, is not confined merely to the germination of their seeds; for after the seeds have become plants, if oxygen is withdrawn from the atmosphere in which they are placed, they cease to vegetate, their leaves can no longer perform their functions. But this use of oxygen, by the leaves of vegetables, is remarkable is confined to the night: it is only in the dark that they absorb it. During this absorption the leaves of some plants, such as the *cactus opuntia*, and the *semper vivum tectorum*, do not emit any portion of carbonic acid gas; but the great majority of plants, such as the *quercus robur* and the *sedum reflexum*, emit a considerable portion, but not equal in amount to the oxygen gas which has been imbibed; and this absorbed oxygen enters, there is little doubt, into immediate combination with other substances, and forms vegetable matters in other shapes. A variety of experiments have, in fact, been made to ascertain this. Thus, the leaves of plants which have but recently absorbed a portion of oxygen gas, have been exposed in the exhausted receiver of an air-pump. Other leaves have been submitted to the greatest heat they could bear without undergoing combustion, but in neither case was any oxygen gas extricated from them. And it has been noted that those plants which absorb the greatest portion of oxygen during the night, are precisely those which evolve the most considerable quantity of carbonic acid gas during the day.

Plants of different kinds vary much in the quantity of oxygen which they absorb. Fleshy-leaved plants, which emit little or no carbonic acid gas, absorb very little oxygen; and these plants, it may be remarked, says Dr. Thomson, can vegetate in elevated situations, where the air is very rarefied. Next in order come the evergreen trees, which, although they absorb more oxygen than the fleshy-leaved plants, yet require much less than those which lose their leaves during winter. Those plants which flourish in marshy ground likewise absorb but little oxygen.

M. Saussure made many experiments upon the uses of oxygen gas to vegetation. He found that it was essential to many of its functions; that it was absorbed, not only by the leaves, but by the roots of plants; that it was there combined with carbon, and the carbonic acid gas thus formed was thence transmitted to the leaves, to be decomposed. The very stems and branches of plants absorb it, and its presence is essential to the expansion of flowers; in its absence seeds will not germinate; and hence one reason why they will not vegetate when placed beyond a certain depth in the soil.

The quantity of oxygen gas consumed during their germination by equal weights of different seeds, varies considerably. Wheat and barley consume less oxygen than peas, and peas less than common broad and kidney beans; the latter consuming 1-100th part of their weight, while wheat and barley during their germination only absorb from 1-1,000th to 1-2,000th of their weight of oxygen gas. Recent experiments have also shown that the more water is impregnated with oxygen gas, the more excellent are its effects, when employed for the purpose of watering plants; and hence one of the causes of the superiority of rain-water. Some experiments by Mr. Hill were decidedly in favour of this conclusion. Hyacinths, melons, Indian corn, and other plants, watered for some time with water impregnated with oxygen gas, all grew with increased beauty and luxuriance. The melons were so improved in flavour; the Indian corn increased in size, "so as to equal in size most of those imported from North America," and all of them grew more vigorously.

It is true that when animal, and vegetable substances, are slowly allowed to decompose in the soil, oxygen does not appear in an uncombined state, being usually in the form of carbonic acid gas, or combined with carbon. Yet in this combination, it is essential to the growth of plants; by hardly any other mode in fact can the carbon of plants be assimilated than by its combination with oxygen. We have seen, how essential to the growth of plants, is a free access of the oxygen of the atmosphere to their roots; now although the organic manures do not directly furnish this supply, yet by their presence, they certainly promote its access, by rendering the soil less close, and consequently more permeable to the atmospheric gases. Every farmer is aware of the fact, that seeds sown on the best pulverized soils, are ever the first to vegetate; he gives perhaps an erroneous explanation when he says, it is because of such soils being so much warmer, than the more backward soils; but he is still aware of the advantage of keeping his soil "open," although he may have mistaken the chemical explanation. It is impossible for the cultivator to examine the sources of supply from whence the gaseous substances of vegetation are derived, without interest, and instruction. To trace the first absorption of oxygen gas, by the roots or the leaves of plants, to note its combination with hydrogen and other carbon, in the endless forms assumed by vegetable substances; its emission in an uncombined state, from the leaves of plants growing in the light: its evolution combined with carbon from the same leaves, vegetating in the dark, or its final combination with carbon, when it arises in the gases of putrefaction, to be

again absorbed and assimilated and the mystic processes of vegetation, are all facts full of interest, and abounding with instruction to the intelligent farmer. Davy saw these things, and Davy reasoned upon them with all the grateful warmth of the chemist, who sees the finger of God in every vegetating substance. He truly enough told the large and intelligent class, who used to crowd his lectures on agricultural chemistry, when speaking of the subject of this paper, that the doctrine of the proper application of manures, from organised substances, offers an illustration of an important part of the economy of nature, and of the happy order in which it is arranged. The death and decay of animal and vegetable substances tend to resolve or-

ganised forms into chemical constituents; and the pernicious effluvia disengaged during the process seem to point out the propriety of burying them in the soil, where they are fitted to become the food of vegetables. The fermentation of organised substances in the free atmosphere are noxious processes; beneath the surface of the ground they are salutary operations. In this case the food of plants is prepared where it can be used; and that which would offend the senses, and injure the health if exposed, is converted by gradual processes into forms of beauty, and of usefulness; the fetid gas is rendered a constituent of the aroma of the flower, and what might be poison, becomes nourishment to animals, and to man.

(To be continued.)

MARTOCK DISTRICT FARMERS' CLUB.

The usual monthly meeting was held at the George Inn, Martock, on Monday, April 6: Robert Leach, Esq., in the chair.

The preliminary business having been disposed of,

The CHAIRMAN said that at their last meeting Mr. Williams had proposed a subject for discussion on the utility of draining generally, which had been fixed for that evening's discussion. He thought the subject a good one, as no good crops could be grown on some land without draining.

Mr. JOSEPH WILLIAMS said that the subject they were about to discuss was one of great importance to all who were occupiers of heavy land. He would say that all arable land which rested on a strong clay subsoil would not only be benefited by draining, but actually required it before it could be cultivated to advantage. This description of land was generally ridged up, so as to leave open furrows to carry off the water, but that did not prevent the land from being very wet in a rainy season; by the excess of moisture, and thinness of soil near the furrows, a great portion of a field was often cultivated unprofitably, and labour and seed expended without any return. He began draining on a small scale three years ago. His system of draining was an inexpensive one, being the plug system. His land was lying in large ridges, about eight yards wide, and he had put a drain in every furrow at the depth of three feet. It was generally of a strong subsoil; but where he had found a soil of a lighter description, he had used thorns, and rammed the earth on them in the same manner as on the plug. The cost of draining after this system was 3d. per rope, or about 22s. per acre. The land he had drained had been perfectly dry ever since.

He had at present a piece of wheat growing after peas, where he had put drains in every alternate furrow last winter, and he now found that by and in those furrows over the drains the wheat was looking as well as in other parts of the ridge, while there was no wheat within two or three feet of the furrows that were not drained; the seed was rotted before it could germinate. He had another field partially drained, which was also sown to wheat; where the land was drained the wheat was excellent, but where not drained the grub had destroyed all of it within three feet of each furrow, notwithstanding that he had sown quick lime, and trodden the ground well with sheep to prevent it. He had put in more seed by these furrows early in February, and the wheat came up well, but the grub had destroyed nearly the whole of it a second time. He thought that was a convincing proof of the necessity of draining wet lands. He had not said anything about other methods of draining, because he had mostly used the plug; but he thought pipe-draining was greatly superior to stone or tile. The cheapness of pipes was a great advantage, but he thought they should soon get them at a still lower rate, for he had found that one-inch pipes, made by Cottam and Hallen's machine, were selling in other parts of the kingdom at 12s. per thousand.

Mr. JOHN CAVE thought they ought to come to a conclusion as to which was the best mode of draining. He should say that by which it could be performed cheapest and in the most substantial manner. He had recently superintended the drainage of a field where the material used was pipes, and he had found this description of draining to answer effectually in carrying off the superfluous water. He had made an estimate of the expense.

His field measured four acres, and he had put his drains longitudinally up the furrows, at a distance from each other of 24 feet. He had dug them 3 feet 4 inches deep, but he thought by the time the ground was levelled they would be 4 feet from the surface. It took 80 rope of drains per acre. He used 2-inch pipes, which cost him 6d. per rope, and which was £2 per acre; the cost of digging and putting in, at 4½d. per rope, would be £1 10s. per acre; the cost of carriage he computed at 5s. per acre, as two waggon loads would be sufficient for three acres. Thus the total cost was £3 15s. per acre. He perfectly agreed with Mr. Williams in what he had said respecting the cost of pipes. He thought they were at present giving exorbitant prices for them, and he had no doubt but that when machinery was used in their manufacture they should be able to get them at about 4d. per rope. He thought no one could bring forward a cheaper and more substantial method of draining than this. There was no doubt at all of its efficacy; he would bring forward an instance to prove this. Mr. Cuff, of Merriott, recently put some pipes under ground to carry water from a stream to some part of his premises; these pipes fitted into each other, and, to prevent any water from getting into them but what came from the stream, every joint was cemented. Mr. Cuff did not turn the water from the stream into these pipes as soon as they were laid down, but waited for the cement to dry; but great was his surprise to find that the pipes threw out a continual stream, which could only be derived from the land; so that if the joints were cemented, the porous nature of the pipes would be sufficient for drainage. His mode of putting in the pipes had been to dig the first two spits of earth with a common wide spade, and then use a narrow channel spade, so that the pipes fitted close in the gutter. Mr. Williams had recommended plug-draining, but he thought there was a great danger of the moles getting down and choking the drains. He thought pipes possessed a great advantage over stone for draining. It was in the winter that they wanted to drain most, that was the period of the year when they had most leisure; but how injurious was often the hauling of stone to the land in that season of the year. Pipes here were an advantage, for the carriage of them was comparatively nothing. So much for the material to be used. He would now inquire which was best—to cut the drains up through a field the wrong way, or across it? People used to be very much prejudiced in favour of cross-draining, but it now seemed fast getting out of fashion. There was one great evil in the system, and that was—the water could only get into the drains at one side; for water would run down hill, but not up. His father, about four

years ago, had put in some drains after this fashion; they were put 23 feet apart, and dug 3 feet deep, but the ground was now found to be wet midway between the drains. He came now to consider what ought to be the depth of draining; he was an advocate of Mechi's system, which was "to tap the barrel at the bottom." He thought all draining ought to be from three to four feet deep. He had noticed when his gutters were digging that there was no water with the two first spits, but when they dug further they had plenty of it. Many said that the water would not get through the clay, but he would ask, if such is the case, how is it the clay is so wet when you come to it? Land was greatly increased in value by being drained, and any good tenant would be glad to give 4s. per acre more per annum to have that improvement effected.

Mr. JOB HALLETT said, there was no improvement he valued so much as draining. He advocated it when he came to Martock first, but what was he then told?—"You'll drain your own pocket, as well as your landlord's." But he was glad that the opinions of his neighbours had changed since then; every one now was disposed to admit the benefits of draining. He had heard of a great many different methods, all of which had their advocates. He had heard of one instance where straw only was used, and that had lasted thirty-five years, and answered well: but he thought the state of the subsoil ought always to be taken into consideration, as what would answer for one description of earth might not for another. He had tried plug-draining, and found it to answer well on one sort of soil; but he would earnestly recommend all who were about to follow that system to cut their drains about a foot from the old furrow, because there was a great danger of the moles making holes down to the gutter. There were in that parish at least five or six different sorts of subsoil, which, he thought, required nearly as many different methods of draining. He had tried thorns, and found it to answer for a time; stone he had also tried, in different ways. He would strongly recommend all who were about to drain not to let their work, for he was confident there was no species of agricultural labour which could be slighted more than this; he believed he was pounds the worse for trusting this work to labourers. He would, therefore, say to every one—"See the work done yourselves." He thought that if pipes were found to answer in their tenacious clay, that that was the best method yet offered to notice.

Mr. E. BURT observed, that though there were many farmers of the olden school who looked on almost all improvements with disdain, yet scarcely an individual will be found but will admit the benefit of taking useless water off the land; therefore, in all probability, the subject they had chosen for

discussion that evening would be generally approved of. They might cultivate, they might manure, they might farm after the best systems, but unless the land was in a fit state to receive these operations all their labour and expense would avail nothing. So that draining, effectually accomplished, must be admitted to be the ground-work of all agricultural improvements. He thought a great question for decision was, whether deep or shallow draining was best. He had, in the course of his experience, assisted in draining about fifty acres on the shallow system; but he was sorry to say he could not speak favourably of it, for he had since found most of it to be much too wet, although the material used was stone. He had had an opportunity, since the last meeting of the club, of witnessing some deep draining at Melbury, on the property of the Earl of Ilchester; the depth was there about $4\frac{1}{2}$ feet—the material used was pipes, and the distance of the drains apart was about 30 feet. A man who was at work there informed him their deepest drains had been found to answer best. Thinking that he should probably illicit some useful information, he had, on Thursday last, sent to Mr. Mechi a letter, stating to him the character of the soil in that neighbourhood, and asking him his opinion on the best mode of draining it. He received from him an answer, which he would read:—

“TIPTRIE HALL, April 1, 1846.

“DEAR SIR,—In reply to your favour, I have forwarded some of my letters on the subject of draining, and you will find two subsequent ones in the *Gardener's Chronicle* of about three weeks since.

“My system of draining answers perfectly well, which is about 5 feet deep in the hill, and about 3 feet near the ditch: the distance from drain to drain is 33 feet.

“I use pipes of one-inch bore in drains up and down the land, not exceeding 300 yards in length.

“I pay 15s. per thousand for my pipes, which are 15 inches long.

“I find that in strong wet clays it is the depth influences drainage more than closeness. Deep drains, still running, will show the land dryer than shallow ones that have done discharging.

“I hope you will come and see my farm some day.

“Yours, truly,

“To Mr. E. Burt, Montacute. J. MECHELI.”

Mr. BURT then produced the published letters which he had received from Mr. Mechi, and requested the secretary to read one of them, which was very applicable to the subject in hand.

The letter having been read, and no other person

rising to speak on the subject, the following resolution was given from the chair, and carried unanimously:—

Resolved: “That a great portion of the land in this neighbourhood will more than amply repay the outlay and expense of draining. That some of the members of this club have found the plug-system to answer well on heavy clay lands; stones, tiles, thorns, and other sorts of material they have also used to advantage: but, in their opinion, the different methods of draining must be varied according to the state of the subsoil. That a member who has tried pipe-draining has strongly recommended it for cheapness and durability. The members generally are of opinion that the system is a good one, but cannot speak with certainty from want of experience. That the members of this club are of opinion that the depth of drainage generally should be from 3 feet to $4\frac{1}{2}$ feet deep.”

We must not forget to observe that a fine sample of new potatoes were produced by Mr. Gould.

After the usual vote of thanks to the chairman, the meeting adjourned until the 11th of May, when the subject of discussion will be on the best mode of cultivation for root crops, proposed by Mr. Josiah Hebditch.

HARLESTON FARMERS' CLUB—Fifth Meeting for 1846, April 8th.—SUBJECT: “The Cost and Value of Protection to the Farmer; the Statistics of the Question rather than the Principle.” Previous to the discussion it was decided, at the unanimous wish of the members present, that the terms of the question should be altered. It was considered that any arguments founded on a comparison of protected with free trade prices of corn would probably be deceptive, because it is not accurately known what portion of the former have been owing to the law, or what share of any depreciation in the latter may be due to its repeal. The principles of free trade in general, and of free trade in corn in particular, with the past effects of protection on agriculture, and particularly on the tenant farmers, and the probable future effects of free trade on these interests, were therefore discussed, instead of the cost and value of protection statistically considered. After an interesting and protracted debate, it was unanimously decided—That a free trade in corn will benefit the nation without injuring the agricultural interest, provided those requests of the farmers for the repeal of the malt-tax, for an improved tenure embracing more liberal covenants, and the other just claims on the legislature and the landowners which this club has always advocated, be at the same time conceded. The club desires also to express its opinion, that the proposed Government measure errs in not making free trade *total* and *immediate*, believing that the delay of three years will act injuriously in deferring the settlement of these necessary arrangements.

AGRICULTURAL AND SCIENTIFIC TRAINING SCHOOL,

KENNINGTON LANE, LAMBETH, NEAR LONDON.

LECTURES ON THE APPLICATION OF CHEMISTRY TO AGRICULTURE.

LECTURE II.—ON OXYGEN.

BY J. C. NESBIT, ESQ., F.G.S., M.C.S.L., &c.

Gentlemen,—I shall have the honour of directing your attention this evening to one of the most interesting of the chemical elements. In the prosecution of our agricultural course, it will be necessary to take notice of those bodies which enter more or less into the composition of vegetables; and you will recollect that in my introductory lecture, I informed you that a certain portion of the elements of vegetables was taken from the soil, and that another portion was taken from the air. I also mentioned to you that the portion which was taken from the soil was called inorganic, and that taken from the air, organic. The organic elements are four—oxygen, hydrogen, nitrogen, and carbon; and we shall commence this evening by taking into consideration the properties of the most important of these four, namely, oxygen: the consideration of hydrogen, nitrogen, and carbon will be reserved for another occasion.

Oxygen is found in the greatest abundance through the whole of this planet. It is found in the air, in the water, in the clouds, in the earth, and in minerals of every variety. It forms a considerable portion of all sand-stones, and clays, and oxides (or rusts) of iron. The fact is, all the oxides or rusts are merely combinations of this substance with different bases or metals; and its very presence in such quantities throughout nature, will sufficiently show the importance of its action. The affinities of oxygen for other bodies are more powerful, perhaps, than those of any element we know; of its action we shall have occasion to speak as we proceed.

The air contains one-fifth of its bulk of oxygen, which, in that case, assumes the character of a gas: every five bushels of common air contain one bushel of oxygen. Oxygen, as a gas, is carried round the world, and penetrates every part; and the substances which require it are always sure to find something from which they can abstract it. Water, which is the next universally extended medium, contains a large quantity of oxygen: every nine tons of water contain eight tons of oxygen—not as a gas, but as a liquid; and in this way it is also disseminated over the world. In the generality of earthy matters, from one-third to one-half is composed of oxygen.

Having thus seen how generally oxygen is diffused through nature, the next point to consider, is the

method of preparing it. You may naturally ask, if oxygen be so extensively distributed in combination with other substances, can you not separate it from some of them and present it to us? It can be done: for, by taking some of the earthy matters, and acting upon them by means of heat, we can separate the oxygen and the base: and when separated we can examine their properties. If you take the black oxide of manganese (which is a compound of oxygen and a metal called manganese) and bring it to a red heat, it will part with some of its oxygen. One pound of oxide of manganese will, in this manner, furnish about 1,200 cubic inches of oxygen gas.

In this way oxygen may be prepared in large quantities, because oxide of manganese is very common. It is to be found in all parts of the world, and is to be had as an article of commerce in great abundance, being much used in the north of England to make chlorine for bleaching. Oxygen may be procured from other oxides:—If you take red lead (which you know is a combination of lead and oxygen) and bring it to a red heat, a portion of the oxygen will be driven off, and you can then ascertain its character. If you take an oxide of mercury, which is commonly called *red precipitate*, and heat it in a glass tube, a similar result takes place; you will get the oxygen liberated and the mercury likewise.

It is not necessary to show you all these experiments. I shall, however, show you the one with the *red precipitate*, because we shall obtain not only oxygen, but mercury also; the two elements of which the oxide of mercury is composed.

Now, I will take the oxide of mercury, or *red precipitate*, and heat it over a lamp in a small test-tube; and as the oxygen is given off, it will drive the air out of the tube, because oxygen is heavier than air. We can now detect it by putting a bit of ignited wood into the opening of the tube; the wood will instantly inflame, for oxygen has a very great affinity for combustible bodies. Oxygen, in fact, is in nature the great supporter of flame and combustion.

By means of other substances, oxygen may be easily procured in the most simple manner. Many of these substances consist of various salts, which are combinations of acids with their bases. All the nitrates furnish oxygen in abundance. Thus the nitrate of soda con-

tains a large quantity of oxygen, as does also saltpetre.

If I heat saltpetre to a red heat, I get in place of it potash, and oxygen and nitrogen liberated; and in this way you can get from one pound of saltpetre 12,000 cubic inches of gas, two-thirds of which will be oxygen. If you employ the saltpetre, and do not urge the heat very much, you will have the pure oxygen, but not more than 2,000 or 3,000 cubic inches. When the heat is urged, the nitric acid is decomposed, and its constituents, nitrogen and oxygen, are both set free. When large quantities of oxygen are required, saltpetre will be found very economical. I used it myself for that reason many years since, for the exhibition of the oxy-hydrogen microscope, in the Mechanic's Institute, Manchester.

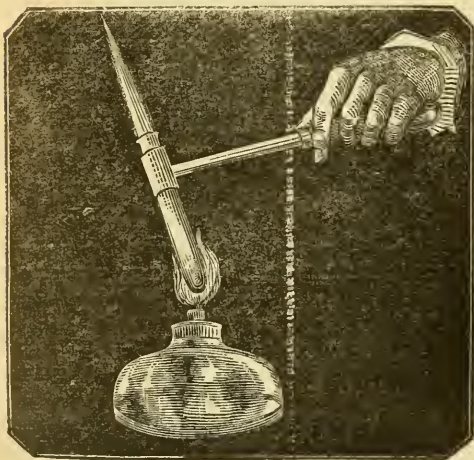
However, the best substance for procuring the oxygen gas is the *chlorate of potash*. This is a beautiful, white salt, consisting of *oxygen*, *chlorine*, and *potassium*. When this compound is heated red hot, the oxygen is liberated; and the chlorine and potassium having combined together, remain behind in the form of a white salt, called *chloride of potassium*.

I will place a little chlorate of potash in this test-tube. On applying the heat of a spirit-lamp the salt will first melt, and then effervesce, from the gas escaping. The heavier oxygen will drive all the common air out of the tube. If now a small piece of paper or wood be lighted, and the flame be blown out, so as to leave a little portion of the end *red hot*, and then be introduced into the tube, the paper or wood will immediately burst into a flame.

If a small piece of ignited wood, such as a piece of a lucifer, be dropped into the melted chlorate of potash, a most powerful action, attended with a vivid light, takes place, and the wood is, as you see, entirely consumed.

Fig. 1 represents the mode of performing this experiment, and the action which takes place.

(Fig. 1).



All experiments with the chlorate of potash should

be carefully conducted, as it is apt to explode with combustible substances even in the cold.

When oxygen is required to be made from chlorate of potash in large quantities, it is preferable to mix about one-fourth of oxide of copper or oxide of manganese with it; as the gas is then liberated at a much lower temperature.

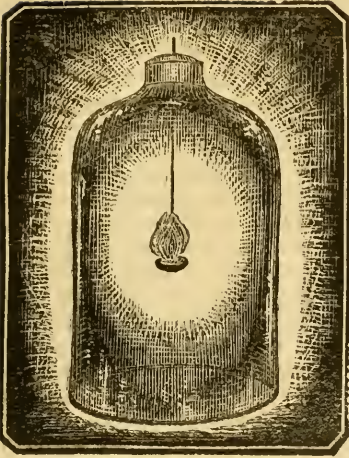
Oxygen gas is also given out in nature, from the decomposition of some of its combinations. The vegetable world is the great source of oxygen. Vegetables possess the power of decomposing two compounds of oxygen, *carbonic acid* and *water*, and of retaining the carbon of the one, and the hydrogen of the other, to form their own tissues. This operation, however, only goes on in the light of the sun or in the effulgence of day. The process is this:—Plants have roots and leaves. By the roots they take up moisture from the soil, and in this moisture are dissolved those substances which plants require for their subsistence. To form the organized parts of plants, however, it is necessary to have the assistance of the leaves, through the vessels of which the juices of plants must always pass, before they become converted into the substance of the plant. The leaves of plants have a peculiar function, namely, that of separating the carbonic acid from the other constituents of the atmosphere, of retaining the carbon of this carbonic acid, and setting its other ingredient, the oxygen, free. After the sap has thus been mixed in the leaves, with the carbon which the leaves derive from the atmosphere, it goes to increase the growth of the plant. The water taken up by the root undergoes a somewhat similar decomposition, its hydrogen being returned and its oxygen liberated.

In some of the products of plants, such as turpentine, all the oxygen of the water and carbonic acid have been liberated.

Oxygen is chiefly remarkable as a most powerful supporter of combustion: it is the substance which in natural operations, consumes and burns up all vegetable and animal matter. It is this oxygen which, by its action upon the carbon and hydrogen of our wood, coal, oil, &c., produces that light and heat which we feel to be so necessary. It is oxygen which causes this candle to burn at the present moment: if deprived of oxygen, it would be extinguished; but if the supply be augmented, its brilliancy will be much increased. I will immerse the lighted candle in this jar of oxygen. In a moment you see the flame becomes brilliant, and burns with so much splendour as to dazzle the eyes.

A similar increase in the intensity of the action is seen, when other combustible substances, such as sulphur and phosphorus, previously ignited in the air, are brought into contact with pure oxygen gas. I will put some sulphur in this copper spoon, and will then ignite it over the spirit lamp. The combustion in the air is only slow; you will see the difference the moment I immerse the spoon in this jar of oxygen. You perceive the intensity of the beautiful blue flame of the sulphur is much increased, and that it tinges all the surrounding objects. Fig. 2 represents the method of performing this experiment, and also shows the beautiful effect produced.

Fig. 2.



The burning of phosphorus in oxygen gas, is perhaps one of the most brilliant experiments that chemistry can produce. Phosphorus (the base of bones) is well known as the powerful substance used in the manufacture of lucifer matches. It burns with great vehemence in common air; but when introduced into oxygen its combustion is increased to such an extent that it is quite impossible to behold the beauty of the flame with unshaded eyes. I will put this piece of phosphorus, which I have previously dried between folds of blotting-paper, into a cold copper spoon, ignite it with a hot wire, and then quickly introduce it into the jar of oxygen. The brilliant light produced is such as to illuminate the whole room as if by the light of the sun. Fig. 2 will represent also the manner of performing this experiment. Phosphorus ought always to be carefully handled, and it must be kept in a bottle filled with water. It has so great an attraction for oxygen that it takes fire on the slightest friction. It must, therefore, always be cut in pieces in a saucer filled with water.

Iron, zinc, and other metals will burn in oxygen with great ease, as I shall have occasion to show you towards the close of the lecture.

It will not be difficult for you to understand why chemical action or combustion should be so much more intense in pure oxygen than in air. In the pure oxygen there is nothing to prevent the intimate contact of the two bodies which are uniting with one another, that is, the burning body and the oxygen; and as fast as one portion of oxygen has acted on the combustible body, its place is supplied by another portion, which in its turn will be wholly expended on the burning body. In common air this is different. Before the combustible body can be acted upon by one cubic inch of oxygen, five cubic inches of the atmosphere must be presented to it, which, of course, will take up five times the time. But the four cubic inches of nitrogen have also the effect of cooling the burning body in passing through the flame with the

oxygen. The amount of light and heat produced depends on the quantity of chemical action which takes place in a given time. It is quite evident that the greatest action in the least time will take place with the pure materials. If we, by any artificial means, can contrive to make common air pass in large quantities through the interstices of combustible bodies, as charcoal, coal, &c., previously in a state of ignition, we shall in a measure increase the action as if we employed pure oxygen, because we shall cause a greater action in a given period of time.

It must now be apparent to all of you that the more oxygen we can get through a common fire-place, or the more that can be brought in contact with the fuel in a given time, the greater will be the combustion, and the greater the heat. In the open air coals burn dull, and do not give out much heat or light in a given time. If coals be put in a fire-place, more air gets through them in a given time, and a great heat will be produced; but then the coals will burn sooner. If you want to get more heat you must enclose the coals in a furnace connected with a high chimney, so that all the air is obliged to pass into the furnace through the bars at the bottom. You will thus have in the chimney a column of hot air, which is lighter than cold air. The cold heavy air will therefore force upwards the light air of the chimney, and endeavour to supply its place: and as the air can only get into the chimney by passing through the furnace, a large quantity of oxygen is in this way supplied to the fuel in a short time. But though you get more heat in a given time, you consume more coals. I will give you another instance—the common blacksmith's forge, where, I have no doubt, you have often seen the workmen blow the bellows till they were almost tired. The object is to send a greater amount of air (that is to say, to send more oxygen) among the coals, and by this means to produce a greater amount of heat in a given time; but in proportion to the rapid production of this heat will be the quantity of coals consumed. Now there is one fact in connexion with this which you will do well to note. A pound of charcoal, in uniting with oxygen, gives out always the same amount of heat, whether burnt quickly or slowly; and the same may be said of hydrogen and other combustibles; and whether the union be quick or slow, or whether a given amount of fuel be consumed in five minutes or five hours, the sum total of heat evolved will be the same. But it is evident that if the fuel be wholly consumed in five minutes, the heat in this case will be very intense during its short continuance; but if it last five hours, the heat will not be intense, but low and continuous.

Now, wherever oxygen is absorbed, that is, when it comes into union with another substance, heat is given out. I will give you an instance where common vegetable matter will ignite spontaneously, merely from the fact of its being brought in contact and union with oxygen. If you take a pound or two of cotton, and mix it with linseed-oil or olive-oil (the best is boiled linseed-oil), and then lay it in a corner, the mixture will be on fire in twenty-four hours. The

cotton exposes a great surface of the oil to the action of the oxygen of the air; and is at the same time, from its porous nature, a bad conductor of heat. Very well; the oxygen and oil begin to act on one another; a little of the carbon and hydrogen of the oil is slowly consumed, and a small quantity of heat is generated, which slightly raises the temperature of the whole mass; for the non-conducting nature of the cotton will not allow the heat to escape as it is produced. More oxygen acts on the oil, more heat is given out, and this goes on till the whole gets to a red heat; light is evolved, and the mass is set fire to.

In the north of England, where a deal of oil is used in machinery, and where it is cleaned by waste cotton, many mills were at one time burned down from the cause I have mentioned. The dirty oiled cotton waste was thrown into a corner on Saturday night, and the mill was burned down before Monday; and it was frequently believed to be the work of an incendiary. Persons have been blamed for the crime; while the real cause was that which I am now telling you. The manufacturers are now more cautious, and take care not to allow the oily waste cotton to accumulate.

Agriculturists are liable to accidents of a similar kind. How much money has been lost from the storing of hay in a wet state instead of in a dry! Wet operates like oil: it enables the oxygen to get hold of the woody matter of the hay, upon which it does not act in the dry. The hay is stacked in a great hurry, without being properly dried. Being damp and porous, the oxygen is absorbed and a little heat given out, which cannot readily escape; a little more oxygen is absorbed, and a little more heat given out, till a red heat is attained, and then fire breaks out. Now the difference between the oil and the cotton and the damp hay is only this; that in the first case the fire breaks out in a few hours (from twelve to twenty-four will be sufficient), while in the stack four or five days or weeks may sometimes be required.

I can show you another case. When farmers want to make manure, they heap up great masses of straw, litter, and excrements; and what takes place? It begins to smoke and gets heated. And where does the heat come from; how is it generated? The mass decreases in bulk very much; in eight or ten months it will have diminished at least a-half. But what is the cause? Don't you see this? The active and energetic oxygen is at work. You have vegetable moistened with water, you have oxygen absorbed, and it consumes the dung; but more slowly than in the case of the hay. I told you that hay may take fire in four or five weeks; but good farmers so manage it that the heat shall not exceed from 80° to 90°. The farmer also wants his dung to decompose mildly and quietly. But what would take place if, instead of keeping the dung pressed down, he was to separate it, and let the air come in? Practical men will tell you that the heat would be largely increased; instances, indeed, have been known of such heaps taking fire. In fact, if these dung-heaps are not properly attended to, they

will readily take fire. You see, from this, that oxygen has a deal to do with manure; for it is by this substance that the farmer gets his heaps diminished in bulk. He gets the most worthless portion taken away; that which is left is more easily carted and more valuable. You see, therefore, what an active agent oxygen is. It acts, too, upon all metals exposed to the air. If you take a knife or a spade, and expose it to the action of the air all night, you will find it next morning of a red colour. And what is this red substance? It is a compound of oxygen and iron, called the oxide of iron.

There are many other combinations which spontaneously take fire and give out heat from the absorption of oxygen. Iron pyrites, a compound of sulphur and iron, is found in large quantities throughout the globe. It is very bright and metallic, looking something like gold. When exposed to air and *moisture*, oxygen is absorbed, which, uniting with the sulphur, forms sulphuric acid, and with the iron, oxide of iron. These two again unite, and form the sulphate of iron, or common green vitriol. As oxygen is absorbed by the pyrites, you are also sure that heat is produced. In the manufacturing districts, where sulphate of iron is largely made from pyrites, care is taken not to allow it to get overheated; and if it should get too hot, water is thrown upon it. Bishop Watson, the celebrated chemist, tells a curious thing in his chemical essays. A man at Elland, in Yorkshire, collected a quantity of the pyrites, under the idea that it was gold, and put it into his barn in a heap. The barn, as was common enough in those days, was made of wood, and moreover the roof was a little leaky, and by this means rain was introduced. This generated a heat, and in the course of a few weeks the heap took fire, and burned down the barn. You see, therefore, how important it is that such things should be borne in mind.

There is another thing very closely related to what I have mentioned. Any of you who have been in the north of England must have seen, all round the great coal-pits of Newcastle, Durham, and other places, large heaps of small coals, covering many acres. These coals have been deposited there, owing to their small value; and you will find that they are always on fire. Perhaps you will imagine that the coals were set on fire? No such thing: they took fire by themselves. When I state to you that the coal contains sulphuret of iron (iron pyrites) you will be at no loss to ascertain the cause. The action of oxygen on the sulphuret of iron is such as to produce heat, and the continued action of this heat causes the coal to take fire. Many singular phenomena of which we occasionally hear, as, for instance, smoking and burning cliffs, near the sea, are due to the action of oxygen on recently-exposed iron pyrites.

But more still. This oxygen, this universally-acting busybody, has something to do with volcanoes and earthquakes. We find that these volcanoes burst out with tremendous force in some places, emitting large bodies of fire. Whence does this arise? This fire is doubtless the product of combustion. And what an enormous power must be generated to produce such

awful results as the overthrowing of Herculaneum and Pompeii, the awful visitation of Calabria, or the destruction of the city of Lisbon!

In connection with volcanoes, it should be borne in mind that they are always near the sea. You know that when you look for their positions on the map, you keep your eye to the coast. Etna, Hecla, Vesuvius, Stromboli, the burning mountains of the Andes, and the volcanoes in the East Indies, are all to be found near the coast. There can be no doubt that water has something to do with them; and water, recollect, contains a great deal of oxygen.

It has been supposed that the matter of the interior of the globe consists chiefly of the metallic bases of the earths: and these, it is well known, have the power to decompose water, uniting with its oxygen and liberating the hydrogen.

Now, if by any means the ocean water penetrates to these metallic bodies, most intense action will be the result; heat will be liberated, and effects produced quite sufficient to account for the phenomena of volcanoes and earthquakes.

There are a few other points which I wish to bring before you. This oxygen is the agent appointed for the destruction of all vegetable and animal substances. Every one of us is undergoing its action. We breathe it, but we return less of it to the air than we took from it. What we inhale produces heat, and this is the reason why your bodies are warmer than the stone walls around you. Without any very great stretch of the imagination, or any very forced comparison, your bodies may be likened to little steam-engines, or blacksmiths' fires. Your lungs operate as a pair of bellows, your mouth is the chimney, and the food is the coal. Your bellows are always going; if you are prevented from breathing for two minutes you will die. Yet, if it were not for the action of the oxygen on your body, you could not live; for from its continual consumption of the muscles of the body, you derive your physical energy and power. If you did not eat, what would be the consequence? Would the bellows cease to work? No; they would go on working till every particle of available fuel (flesh, fat, &c.) was consumed. This shows that, if you take no food to supply the waste of the muscles, you must, like a fire, ultimately *go out*. If food be withheld, the parts of your body, such as the fat, the muscles of the cheeks, of the breast, and all other available parts, would be consumed by the action of the inspired air before the bellows would cease to work; and, lastly, the brain would be attacked, and you would die. Now, this always takes place when, by any means, food is not taken or not properly digested. On the other hand, if the blacksmith overloads his fire, and does not blow his bellows enough, the flame goes out; and you, if you are always eating and never blowing your bellows enough, you are still liable to *go out*. You are putting on too many coals, and that is the reason why I recommend you to enjoy yourselves at play, without which you can never expect to grow strong. Our life, and the life of all animals, therefore, depend on the action of oxygen and the supply of food. When these two are in a state of equilibrium or balance,

we are in a state of *health*. When either one or the other are in excess, our normal state of health ceases, and various maladies ensue, which continue until the cause is removed. Eventually, however, the oxygen obtains the mastery, and these bodies of ours, like those of our ancestors, will be overcome by this powerful agent, and their elements will be returned into the great laboratory of nature, to furnish the principles of life and existence to succeeding generations of animated beings.

All vegetable matters undergo a similar change, and they also are eventually decomposed, to furnish again the elements of vegetable life.

All animal and vegetable substances, therefore, unless preserved in some peculiar manner, are resolved into their original elements. But, if protected from the action of oxygen, they may be preserved for an indefinite period of time. Wood is painted to preserve it from contact with the oxygen of the air, and it thus lasts much longer. Again, coal is the remains of immense forests of primeval periods, and it has not yet been decomposed into its elements. These immense deposits of vegetable matter were, when deposited, covered with soft mud, so that the oxygen was prevented from coming in contact with them, and by the constantly-increasing pressure from superincumbent deposits, the mud became a rock, and the action of the oxygen became less and less for each succeeding year. The consequence is, the mass has been preserved for an immense period of time.

Animal matter may also be easily preserved out of contact with air. The finest salmon of Scotland, the most beautiful soups, game, fowls, and fish of all kinds, are now packed in air-tight tin cases, and can thus be sent to all parts of the world. The travellers across the desert of Suez, in their journey to the East Indies, often enjoy the luxury of *fresh* Scotch salmon.

Oxygen, then, is one of the most important elements that we know; everything else yields to it in importance; it is found to pervade all nature; it is necessary for the existence of animal life, and is an essential of vegetable growth; and, in order that you may be able to trace its effects, for practical purposes, in the economy of the farm, I have endeavoured to explain its properties and action, not only on vegetables and animals, but also on many elementary bodies not directly connected with vegetation.

Before I conclude, I shall submit a few interesting experiments, showing the very powerful affinity which oxygen has for some substances, and likewise the intense heat produced when oxygen and hydrogen gases are burned together.

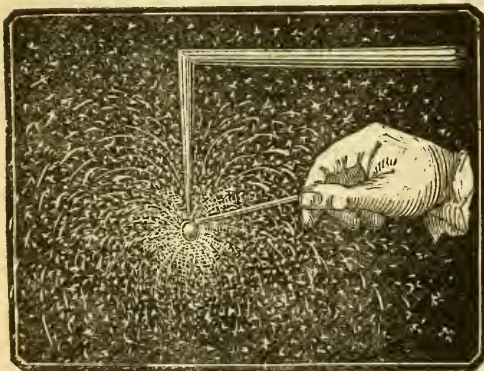
When the two gases, oxygen and hydrogen, are mixed together in any vessel, a most violent explosion will take place, on the application of a light. This arises from an immediate union between the two, and the vapour of water is the result of the combination. If you try to cause the mixture to burn silently, like common gas, by means of a jet, the flame will immediately retreat through the jet, along the interior of the pipe, to the magazine of the mixed gases, and a most frightful explosion will be the

result. Mr. Hemming has, indeed, in a measure prevented this, by filling the interior of the brass pipe through which the mixed gases pass, with thin copper or brass wire; but still accidents may very easily arise in unskilful hands. It is, therefore, much better to burn the gases by means of the jet contrived by Mr. Maugham: by this contrivance, the gases are only mixed just as they issue from the mouth of the jet, so that it is impossible that any explosion should take place. Each gas is confined in a separate gas-bag, made of the strongest India-rubber cloth or Mackintosh, and a pressure is given by the application of weights on the boards which rest upon the bags. I will now turn the stop-cock connected with the hydrogen, and ignite the gas as it issues forth. You will observe that the flame burns in an irregular manner, and that its edges are jagged. I will now turn on the oxygen. Observe the immediate difference: the jagged edges are at once gone, the flame is now sharp and pointed. We have in this little flame the most powerful heat that chemists can produce.

The most refractory clays, and gems of various kinds, as the ruby, the sapphire, the amethyst, &c., melt with the greatest ease in this flame. The diamond is immediately dissipated and lost. The metals all burn with remarkable brilliancy in this flame. I have here a piece of steel wire. I will introduce it into the flame, and you will see it immediately melt, and burn with the most vivid scintillations. I will now turn off the hydrogen, and allow the oxygen only to play upon the white hot metal. You perceive the scintillations are immediately increased, and that the effect is most brilliant.

Figure 3 represents the combustion of the steel wire in the jet of oxygen.

Fig. 3.



(Mr. Nesbit then exhibited the combustion of various metals, such as zinc, copper, bismuth, tin, lead, antimony, &c.; the whole of which burned, in the gas, in the most brilliant manner, at the same time exhibiting as they burned various and beautiful colours.)

Mr. Nesbit then proceeded:—The flame of this blow-pipe exhibits very little light, though it produces so great a development of heat. You may be surprised at this; but it only requires the presence of some solid

matter to produce the most brilliant light. Gases by themselves cannot be made to exhibit light. If you pass common air through red or white hot tubes, the hot air issuing exhibits no light; but any solid body immersed in the current becomes red or white hot immediately.

The common candle and gas exhibit their light in consequence of the particles of solid carbon which exist in their respective flames.

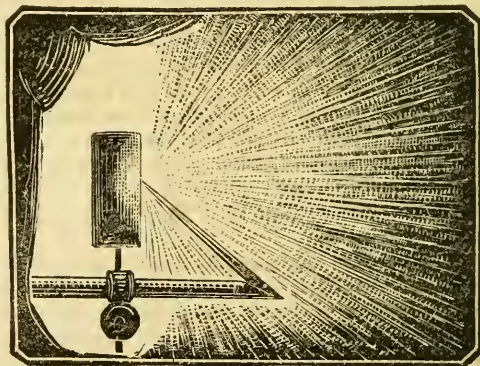
I will allow the jet of gas to play upon a piece of common tobacco-pipe. An intense light is immediately produced, and the pipe is melted, and converted into a sort of sapphire, which cuts glass with the greatest ease.

If we had any solid substance which could stand the heat of this flame without melting, we should then be in possession of the means of making the light continuous. Common lime happens to be a substance so refractory that it withstands very well the action of this flame.

I will now allow the jet to play upon a cylinder of lime. The light produced is most intense. The whole room is illuminated. But perhaps the best insight into the intensity of the light may be had by observing that the *flame* of the candle is actually *shadowed* against the wall.

Figure 4 represents the oxy-hydrogen or Drummond light.

Fig. 4.



This light has been proposed to be used for light-houses; and, with proper reflectors, can easily be distinguished at the distance of twenty or thirty leagues.

Though my subject is not half exhausted, I must draw my lecture to a close. I have to thank you for your attention, and I trust you will endeavour to get practically acquainted, by reading and experiment, with all the properties of oxygen. Many things which I have found necessary to present in this lecture may appear to you not quite relevant to the subject of agriculture; but allow me to state, that if at any time you wish to know the real boundaries of a kingdom or a county, you must constantly have recourse to a point of view from a neighbouring district:

TENANT - RIGHT.

BURTON-UPON-TRENT FARMERS' CLUB.

We attended a meeting of this Club on Thursday, April 9, which was called for the purpose of discussing the important subject of Tenant-right. The meeting was attended by many influential practical farmers.

In the *Reporter* and *Chronicle* of the 3d instant, we published the report of a committee appointed by the club to make such suggestions on the subject of tenant-rights as they deemed proper; to that report certain resolutions were appended, and afterwards circulated among the members of the club, with a view to their being made matter of discussion at a general meeting which was called for the 9th instant.

Mr. DANIEL, in the absence of the president, took the chair, and called upon the secretary to commence the proceedings.

Mr. J. D. GREAVES read the proceedings of the last meeting, and a copy of the report and resolutions above referred to. Mr. Greaves stated that, as the members of the club were well aware, the attention of the members was called, at a former meeting, to a circular which he received from a Committee of the London Farmers' Club appointed to investigate the subject of tenant-rights, wherein it was requested that the Burton-upon-Trent Club should forward to them such suggestions as might appear useful in carrying out their object. He then read a letter received from the Secretary of the Wingerworth Farmers' Club, stating the views of its members on the subject; after which—

The CHAIRMAN called upon Mr. Abraham Bass to open the discussion.

Mr. BASS then rose, and spoke to the following effect:—As a member of the committee appointed by you to enquire into the subject of tenant-rights, I feel called upon to offer a few observations on the suggestions and resolutions which you have just heard read. I ought, perhaps, to apologise for interfering in a matter in which I have no apparent interest, and of which I cannot be supposed to be a competent judge. Although I am not a farmer, and, what I much more regret, I am not a landlord (*laughter*), many of the farmers belonging to this club requested me to introduce the subject of the best mode of tenancy during last year; because, although I was not one of them, they gave me credit for having a very sincere regard for their welfare (*Hear, hear*). I shall not pretend to be able to pronounce any decided opinion as to the best means of carrying out the principle embodied in the resolutions; it would require a more practical acquaintance with agricultural affairs than I possess, to form a correct judgment on that point; but as to the principle itself, that it is both just and expedient for a tenant to have a legal right to receive compensation for improvements, I think I may be allowed to speak with freedom (*Hear*). I am not, indeed,

quite sure that a person not immediately interested in the question is not full as likely to come to a sound conclusion on the subject as a farmer or a landlord; more especially if it be one who, like myself, has something to do with the business of both (*Hear*). It must be obvious to every one that within the last few years many circumstances have occurred to place landlords and farmers in a different position towards each other than they used to stand in. The landlords, as a body, are not now-a-days willing to let their land at less than its real value, in order to secure the many services which used to be required of their tenants under the feudal system, a system under which the whole of the land in this country was for many centuries held. It is now nearly abolished. When not a remnant of its practice or spirit prevails, so much the better will it be for the best interests of both landlords and tenants. It is generally admitted, and I don't think it will be denied, at least by farmers, that rents are full as high as tenants can afford to pay (*Hear, hear*). Agriculture, as Lord Francis Egerton has well observed, is a species of manufacture, of which the land forms the machinery, and this machinery the landlord lets to the tenant at the price it will fetch in the market. If this machine is lessened in value whilst in possession of the tenant, it seems but reasonable that he should make up the damage it has received, and in such a case the law does give compensation, and the landlord has a power to recover for dilapidations. On the other hand, if the machine (the land) be improved by the tenant, so as to be worth more to rent to the next possessor, is it not equally reasonable that the landlord should pay a compensation for such improvement? (*Hear, hear*). Now, in the latter case, the law falls short of the desired end, and does not give a legal right to the tenant to recover for improvements (*Hear, hear*). There is always, I admit, an *implied* engagement to leave the land in possession of the tenant without increase of rent, until he has had time to reap the benefit of whatever outlay he has incurred in improving the land; but I boldly appeal to the general body of farmers, and ask them, whether improving tenants, compelled from the force of circumstances to quit their farms before they had time to reap the benefit of their improvements, ever do receive fair compensation for them? (*Hear, hear*). When a tenant leaves his farm, it is generally under circumstances which do not conciliate towards him the good will of his landlord or his agents, and his claims are, therefore, considered in a spirit which is seldom the most friendly. It is a common remark among farmers, that everything is denied to an out-going, and everything granted to an in-coming tenant; and the effects of "*before and after*," so often experienced in the different relations of life, nowhere

meets with a more marked illustration than in the cases of "in-coming" and "off-going" tenants (*Hear, hear*). Now, what tenant can feel safe that he shall not be obliged to quit his farm, or that his landlord will grant him compensation when he does quit it? He may have a perfect trust in his landlord's character, but can he be safe that his successor will resemble him; and how can he tell how soon his landlord may die, or sell his estate? It may be convenient for the tenant to quit his farm; he may fall into misfortune and be obliged to quit; he may offend his landlord; or he, too, may die. Numerous other causes leading to doubt and uncertainty could be named without any great stretch of ingenuity, but it would be useless to weary you with them. Is it to be wondered at, therefore, that the general body of tenants are become impressed with the idea that some stronger guarantee of their equitable claims is necessary to their prosperity? The state of agriculture is changing every year, and new modes of culture are discovered by which land may be made to grow a larger amount of produce, and at a less expense, than is possible until these new means are tried. The farmer who adheres to the old system is brought into competition with others who have abandoned it, and his profits are every year becoming less. To enable him to keep pace with the forward movement, he must begin by investing additional capital on his land. Without reckoning such improvements as draining, the merely increasing the fertile power of the soil by manures cannot be done without considerable outlay. Without a stronger guarantee than he now has, the tenant-at-will cannot prudently incur a large outlay, and without such outlay he cannot prosper (*Hear, hear*). If the evil be admitted, we should seek a remedy. It is said that the relation between landlord and tenant is a matter which nobody else has a right to interfere with, and that legislative interference would destroy the good feeling between them. I cannot agree with this objection, and I believe nothing would so much tend to improve the good feeling of tenants towards their landlords, as the knowledge that they could receive nothing but benefits at their hands (*Hear, hear*). That kind of feeling which arises from a fear lest injury should be done to him, it does not appear advantageous to the landlord to cultivate in the tenant. There is no tie so binding as that of mutual self-interest (*applause*). As a friend of mine, known to many of you, once said to me—"Self-interest is the only true perpetual motion; it is a machine that never wants winding-up" (*laughter and cheers*). It may be said that injustice would be done to the landlord if he were compelled to pay for improvements of his land, when perhaps he might have no desire to have his land improved. In such a case, if the law gave the tenant a power of recovering compensation, the landlord might modify the law by any kind of agreement which he chose to exact before the tenant entered on the land. The only difference would be, that whereas now it requires a special agreement to give a tenant any kind of compensation for improvement, it would then require a special agreement to prevent him from claiming what the law should say was his just right. At present there is a law which gives the landlord compensation for damage, but

which gives nothing to the tenant for improvement (*Cries of "Hear, hear"*). In this arrangement there is evidently a kind of Irish reciprocity which cannot be too soon done away with (*Hear, hear*). If the interference of the law is good for the landlord, why not extend its benefits to the tenant? (*cheers*). If it be not just to extend the law to compensate the tenant, repeal that law now in favour of the landlord, and then the dependence on good feeling or implied arrangements would be mutual, or the recourse to special agreements would be essential (*cheers renewed*). The longer I attend to the subject, the more I become convinced that the many impediments to proper agreements between landlords and tenants will not be overcome, except by giving the tenants a legal claim where there is no special agreement. There are impediments on both sides. Though many landlords are desirous of having their land highly farmed by their tenants, and are willing to give security for the capital invested in improvements, yet there are too many who are careless, or even averse to putting the tenant in an independent position. On the other hand, there are many tenants too timid to undertake leases, and many others occupying small farms with small means to whom it would not be advisable to grant them. Nothing but agreements from year to year, with clauses providing for compensation for improvements, would be accepted by this numerous class of tenants. I feel no doubt that the great body of farmers would rejoice in attaining a legislative provision for compensation, and I must confess my inability to see any reasonable objection on the part of the landlord to such a measure. If a landlord tempts a tenant to improve his land, he incurs a moral obligation to take no advantage of him (*Hear, hear*). What possible objection then can he urge, if the law should compel his successor to give what he would willingly have granted? But, as I have said before, whatever the law may be, it will always be in the power of the landlord to declare by a special agreement whether he would compensate for any improvements, and the tenant would then know what he was trusting to, and would act accordingly. A legal title to improvements is no novelty in legislation. If a tradesman erect buildings for the purposes of trade, they are his own. He may either remove them, or sell them to his landlord, or to the tenant who succeeds him. But the improvements of a tenant of land cannot be removed; yet they differ from buildings erected for purposes of trade in this respect: in the case of trade buildings, a landlord might not find another tenant to pay an increased rent for the money laid out, and therefore it is but just that the tenant should have the power of removal rather than a power to compel the landlord to take to them at a valuation. But it is not possible to conceive a case where increase of the productive power of land does not also increase in like proportion to its renting value. Now, as the new value given to the land cannot be taken away by the tenant, what possible reason can exist why the tenant should not enjoy a claim to be paid for it? Can any one give a good reason why farm buildings erected by the tenant should not either be removed or paid for like trade buildings? If their erection has increased their renting value, the tenant should have

compensation or the power of removing them. I have observed that in the discussion of this subject at the London Farmers' Club, none of the eminent farmers who spoke seemed to have any doubt that a just valuation of tenants' rights could always be made by competent land valuers. If a farmer has a beneficial interest in a lease, and is at liberty to dispose of it to another, there is never any difficulty in estimating its worth; and in what does this case differ from that of a tenant leaving unenjoyed improvements in a farm held at will? (*Hear*). I do not think there will be any dispute about the principle which should be observed in making the valuation, and that the principle embodied in the report that has been this evening read here is the proper one, namely, that a tenant should have what an intelligent farmer would have required as a matter of bargain. As the circumstances vary in every district, and almost on every farm, I do not think any fair valuation can be made unless the arbitrator has the power of awarding compensation according to the peculiar circumstances of each case. It seems to me that the whole subject relating to the mutual claims of the off-going and in-coming tenants, and of the landlord, requires a thorough revision by the legislature. In claims of the landlord for dilapidation, or for which the tenant claims remuneration, the custom of the country is followed; and this custom varies in almost every county, and is, more or less, in all, at variance with the present state of knowledge of agriculture (*Hear, hear*). The amount of compensation is never that which an intelligent valuer, estimating the worth of a tenant's improvements, or the damage caused by his negligence, according to his own standard of what is fair, would arrive at. I should be very reluctant to attempt to excite any ill-feeling towards landlords. I think them, as a body, a class of men of which this great nation has every reason to be proud. It is not the *men* I complain of—it is the *system* (*Hear, hear*); and there is not a farmer, placed in the same circumstances, who would not have acted in the same manner as they have done (*a laugh*). It is for placing checks upon the infirmities of our nature which I advocate (*Hear, hear*). We are told not to trust in princes, nor in any man. What man can trust himself? I could not; and there is nothing so calculated to place us out of temptation as a fair and clear definition of our mutual rights (*cheers*). If I were a landlord, I should be so afraid of being a hard one, that I would bind myself in writing to be a good one (*cheers and laughter*). If any wealthy individual will make the experiment and give me a large estate (*laughter*), I will at once enter into a written agreement to give my tenants long and liberal leases at corn rents, and then we shall fairly row in the same boat (*cheers*). Not in a boat with a nice snug warm cabin for myself to retreat to, whilst my tenants and fellow-voyagers were outside passengers, exposed above to the storms and tempests; but we would share sunshine and rain, fair and foul weather together, and I have no doubt that our joint efforts would then bring our vessel and cargo prosperously and safely into port (*applause*). Mr. A. Bass concluded by moving the subjoined resolutions:—

"That the Burton-on-Trent Farmers' Club is of opinion that a tenant of land, from year to year, ought to enjoy a legal claim to compensation for such improvements as he shall have made during his tenancy, and for which he shall not have received the whole benefit which he is fairly entitled to claim.

"That the tenant has under a tenancy-at-will a fair claim to the enjoyment of his improvements for as long a period as a good farmer would require if the length of his occupancy were made a matter of agreement beforehand.

"That impartial arbitrators chosen mutually by the landlord and tenant would without difficulty form a correct estimate as to what belonged to the tenant on this principle of adjustment.

"That it appears to the club to be advisable for the general body of farmers to join in petitioning the legislature to make a law which would give to the tenant a legal right to recover from the landlord such compensation for improvements made by him as impartial and competent arbitrators would decide to be his equitable right."

The CHAIRMAN requested Mr. Chawner to favour the club with his sentiments.

Mr. RICHARD CHAWNER (of Wall, near Lichfield) was the next speaker. He said, in effect, as follows:—Mr. President and Gentlemen—I have much pleasure, as a member of this club, in assisting at a discussion on a subject so important and so happily timed as tenant-rights. However numerous and important the subjects proper for us to discuss, the present one ought, in my opinion, to take precedence of all others (*Hear, hear*). We come prepared in some degree to consider this subject, by the excellent report which the committee has circulated amongst the members. I must, however, make one objection to that report; and the same objection will apply to the manner in which this subject is generally discussed. It is placed on too narrow a basis. Tenant-rights should not only include the relations of landlord and tenant, but should recognise the responsibility of the tenant to the consumer—the public at large. Every man to whom a portion of the soil of this country is allotted for cultivation undertakes to apply sufficient capital and skill to enable that soil to yield its utmost increase. This, at least, is the obligation upon him. Some may think these observations irrelevant; but reflect for a moment upon the present position of the tenant-farmer. We are told, and properly so, to call no longer upon Jupiter, but to put our shoulders to the wheel. Is not this time the time to discuss our present subject—tenant-rights? for unless the position of the tenant be secure and satisfactory, it is vain to call upon him to expend his capital and skill in the cultivation of the soil (*Hear, hear*). In discussing this subject, I shall endeavour to keep this principle in view, namely, the responsibility of the tenant not only to the landlord but to the consumer—in other words, the good cultivation of the soil. If the farmer be (according to the authority of Lord F. Egerton) one of the highest order of manufacturers, he must of necessity consider his *customer*—the *consumer*. In what position, then, ought the tenant to be placed? First of all he requires security of tenure (*Hear, hear*). He must have the security of a lease for years, say twenty-one, renewable every seven with the consent of the contracting parties. A long connexion with College

property has satisfied me upon this point. No prudent man will expend his capital—no skilful man can have the opportunity of carrying out his projected improvements (the result frequently requiring years for its development) unless he be insured in the possession of his farm for a certain term of years (*cries of "Hear, hear"*). The next point of importance relates to the conditions of the tenure, the covenants in the lease; and here the same principle must be kept steadily in view, namely, the good cultivation of the soil. This may be called the landlord's right; and in order to secure it he should have the power of entering by himself or agent to inspect the state of cultivation, and of referring any question of dilapidation or neglect of the rules of good husbandry to competent and impartial authority (*Hear*). The schedule which should be appended to every lease, containing the system and state of cultivation of the farm, would be a very sufficient guide to any competent arbitrator between the parties. In addition to the respectability and capital of the tenant, the ever-ruling principle of *self-interest* is a security to the landlord; for it is notorious that in the good cultivation of the soil, and in that only, can the tenant hope for any adequate return for the expenditure of his capital and labour (*Hear, hear*). On the other hand, the tenant ought to be allowed the uncontrolled power over his own skill and capital: he must be allowed to cultivate his farm as he thinks proper (*Hear, hear*). We talk of confidence in landlords; but where is the confidence in the tenant, who is required to cultivate his farm according to a certain and unvarying system, to pursue the same course of cropping under all circumstances? (*Hear, hear.*) We have but to reflect upon our changeable climate, our "weeping skies," the change in markets, the facility of procuring manures suitable for certain crops, to be convinced at once of the absurdity of the present system (*Hear, hear*). And here I would ask those objectors to the ignorance of the English farmers to reflect upon the restrictions and difficulties under which the tenant-farmer has hitherto pursued his useful avocations. And now, gentlemen, I would gladly pause, but that it is necessary to consider that worst of all tenures, tenancy-at-will (*Hear, hear*). Unfortunately there are circumstances under which this system will be continued: I deeply regret it; because the soil never can be cultivated according to its capabilities under such a system of tenure (*Hear, hear*). Some members of our club may consider that I lay too much stress upon the good cultivation of the soil; but I ask you to contrast well-cultivated districts with neglected ones. Compare Lincolnshire and parts of Norfolk with Wilts and Dorsetshire. In the former case it is well with all interests—the owner, the occupier, and the labourer; but in the latter how true, miserably true, is the reverse! The unsatisfactory state of tenant-rights may be illustrated by what takes place in courts of law. Evidence is produced for the plaintiff as to the custom of the country: equally respectable is the evidence for the defendant; but how conflicting, how totally opposed each to the other! The learned judge, in despair, declares there is no law in the case; it must be referred; and it is—to a gentleman as remarkable

for his impartiality as for his total ignorance of the subject in dispute (*cheers and laughter*). Can it be said then, gentlemen, that tenant-rights are now upon a satisfactory basis? (*No.*) If this miserable system of tenancy-at-will must be continued, I would venture to make a suggestion, which if it please neither landlord nor tenant, may at least protect the soil. It is this—As the *off-going* tenant seeks to do as little as possible for the farm which he quits, so the *on-coming* tenant schemes to pay as little as possible, and the soil (*i. e.*, the consumer) suffers; and, as every practical man knows, the farm where the tenant is frequently changed requires a constant increase of capital to restore its cultivation, "to stay the plague," I would place the landlord as the *in-coming* tenant. Let him pay the *off-going* tenant liberally for his cultivation up to the end of his term, and then charge the outlay upon the succeeding tenant in the shape of rent. The tenant will thus have his capital in hand to proceed at once with the cultivation of his farm (*Hear*). And here I would ask you to consider the difference of entering upon a farm in a good state of cultivation, and one in a dilapidated condition. I have trespassed too long upon your attention. The importance of the subject must be my excuse. It must be sifted to the bottom; it must be discussed at every farmer's club—aye, and at every market table in England (*cheers*). We take no selfish view of tenant-rights; we desire, above all things, the good cultivation of the soil. If we succeed in placing tenant-rights upon a secure basis, we shall equally protect the rights of landlords, and promote to the utmost of our ability the prosperity of the land we live in (*much applause*).

Mr. WORTHINGTON having been called upon, said he agreed with every word of the resolutions. In his opinion nothing was more unjust than that the landlord should have power to come upon the tenant for dilapidations, and the tenant should have no power to enforce a consideration from the landlord for improvements (*Hear, hear*). He (Mr. W.) was an Englishman, and as such was an enemy of injustice (*Hear, hear*). "Sauce for the goose, sauce for the gander;" but in a general way he thought the landlord got both goose and gander (*laughter and "Hear, hear"*). He was aware that many landlords were disposed to act fairly, but then they should be bound to do so in all cases, and have no unjust privileges (*Hear, hear*). A law ought to be made to place the rights of landlord and tenant on an equality (*Hear, hear*).

Mr. GOVAN coincided with the views that had been expressed by Mr. Worthington and other gentlemen. He hoped to see the day when landlord and tenant would be placed on a footing of equality. He never yet saw an agreement that he was disposed to sign, because agreements were generally all on one side (*Hear, hear*); and he was satisfied that the day was about to dawn when one-sided things could exist no longer (*cheers*). He thought the club had done wisely and well in taking up the subject; and he would only add, that he trusted it would lead to a favourable issue (*Hear*).

Mr. C. STOKES (of Kingston, near Loughborough, who attended the club for the purpose of hearing the discussion) was next called upon. He said he had

pleasure in having an opportunity of attending on the present occasion to hear the discussion upon the subject of tenant-rights, having had considerable experience in valuations of this description. He had invariably found, where the land was in a state of good cultivation, the tenant, upon quitting his farm, had been injured by leaving his unexhausted capital (for which the custom of the country allows him no claim) for the benefit of those who succeed him (*Hear, hear*). It is, therefore, impossible to expect that tenants from year to year will expend their money in improving their farms, unless security is given to them for a fair valuation of the improvements they have made when they quit them (*Hear, hear*). What has produced the superior farming in Norfolk and Scotland but the farms having been let under lease for fourteen or twenty-one years, thereby inducing men of capital and skill to embark in agricultural pursuits? (*Hear*). Mr. Pusey is of opinion that the best farming in this country is in the county of Lincoln, under liberal tenant-rights, binding the tenants to a certain mode of management in applying bones, &c., &c., and the landlords to repay them a fair proportion of that from which they have not received the benefit when they leave their farms (*Hear, hear*). This question was asked a tenant, whose farm was in a high state of cultivation—"Will you accept a lease for twenty-one years, and leave your farm in as high a state of cultivation as it is at the present time?" to which he replied that he would not, as he should be injuring his family by leaving several hundreds of pounds upon his farm for which he could claim no compensation under a lease; and therefore he (Mr. Stokes) could not agree with Mr. Chawner that leases were in all cases the best system of letting land. The land let under lease is generally reduced to the same state as it was at the commencement; and this he thought was the reason why the farming of Lincolnshire had surpassed that of Norfolk and Scotland. In conclusion, Mr. Stokes said, it is desirable that this subject should be discussed with the greatest respect to the landowners, and that nothing should be said or done which will prevent them uniting with the occupiers in producing improved agreements between them, their interests being inseparable (*applause*).

Mr. PRATT, Mr. DICKEN, Mr. FAULKNER, Mr. COPE, and other members expressed briefly their cordial concurrence in the resolutions.

Mr. ARDEN had experienced great satisfaction in listening to the excellent addresses that had been given, and fully concurred in the resolutions.

Mr. GEORGE GREAVES said—I ought, perhaps, to make an apology for venturing to take part in this discussion; we who are not farmers may seem not to have any title to interfere in it. I cannot, however, help offering my congratulations to the club on the ground they have taken in reference to this important subject of tenant-rights. I have viewed with great pleasure the progress of the movement towards a better system of farming; but much as I rejoice in our advance in the practice of farming, I am much more pleased to see that the farmers are likely to win for themselves a better and

more independent position. At present the question of tenant-rights is a novel one, and there does not prevail an apparent unanimity of sentiment with regard to it among farmers. But I believe this want of unanimity is only apparent. All want to have an assurance that the capital they invest in improvements will not be lost to them—but they differ about the means of effecting their object. It is thought by some that the tenants should have by law a lengthened tenure of the land; but though I am sure that long leases are best for the landlord and tenant, I do not see how they could be enforced by law without unjustifiable interference with the rights of property. The utmost extent we can go to seems to be, to give a tenant a legal right to compensation for improvements when no special covenant is entered into (*Hear, hear*). A law declaring the tenant to be entitled to just compensation for unexhausted improvements would at once effect more than would be effected by fifty years' agitation of the subject by farmers (*Hear, hear*). I am not prepared to deny that the common system of tenancy-at-will is favourable to a certain class of tenants where they hold land under the best landlords; but I take the liberty to say that it is only in the case of the best landlords and the worst tenants that it is the most favourable (*Hear, hear*). I have conversed with a good many people on the question, and I have never met with one who did not acknowledge that a tenant ought to have compensation on leaving his farm, provided it could be done without doing injustice to the landlord (*Hear*). This seems to me to be the only question—Can the tenants' rights be fairly ascertained? I have not the least doubt that they can; and I agree with the report of our committee that this can only be done by a valuation made by arbitrators having a discretionary power to award compensation according to the particular circumstances under which the improvements have been made (*Hear*). It is sometimes said that a tenant's permanent improvements alone ought to be allowed for; but as the report of our committee very justly argues, all improvements are more or less permanent, for there are none for which the tenant is immediately repaid. If a tenant took land for two or three years, would he expend money in manures, or lay part of it down to grass, or subsoil it, or even give it a thorough cleaning? The tenant has just as good a claim to compensation for such improvements as he has for buildings erected, or for drains laid in the soil. In one respect I think the report of the committee falls short of what is required to insure good farming in all cases. It only recommends compensation in the case of tenancy from year to year; but it was very properly remarked at the London Farmers' Club, that in the case of a lease farmers were obliged to remit their improvements towards its termination, and get back all which they could, and thus injuring the land and their landlords; while if they were allowed for improvements made during the latter part of the lease, the interests of all would be better cared for. By the law, as it now is, the landlord can recover for dilapidation of his land; but everybody acquainted with farming must be aware how very unequally and unjustly the

law operates. A tenant may have improved his land to the amount of many hundreds of pounds; but if he has omitted to crop a single field according to the custom of the country, or has failed to repair a barn, or clean a ditch, or mend a fence, his landlord may recover from him; although, if a fair balance were struck, a large compensation would be due to the party who was actually obliged to pay it (*Hear, hear*). Whatever objections may be made to any of the plans of estimating the mutual claims of landlord and tenant, none can certainly be so bad as the present system (*applause*).

Other MEMBERS gave in their concurrence; and the feeling in favour of the resolutions was quite unanimous.

Mr. A. BASS, in answer to Mr. Chawner, remarked that the question as to the best mode of tenure was decided by the club long ago in favour of long leases. The sole object of the meeting that night was to take

some specific act, and to coalesce with other clubs in petitioning the legislature to place the tenant on an equal footing with his landlord. For himself, he was of opinion that the whole law of landlord and tenant required revival (*Hear, hear*).

The CHAIRMAN then put the resolutions, and every hand was held up in favour.

Mr. CHAWNER suggested the propriety of sending a formal notice to the landlords of the district, informing them of the decision of the club, and requesting their co-operation in petitioning the legislature. He had heard many landlords express themselves favourably to the resolutions.

Mr. A. BASS remarked that they were, in fact, a club of landlords and tenants.

The suggestion was agreed to. It was ordered that petitions be prepared for signature, and the meeting broke up.—Derbyshire Reporter.

THE POTATO DISEASE.

SIR,—The subjoined extracts from a letter recently received by me from a gentleman (J. E. Teschemacher, Esq., of Boston, Massachusetts, United States of America), whose practical experience, as well as scientific attainments as a botanist and chemist, entitle him to the highest respect, seem to me of such great importance, that I beg leave to place them at your disposal.

Respectfully, your obedient servant,

56, Charing-cross,
April 20.

HENRY COLMAN.

“ Boston, March 25, 1846.

“ You are aware that, in the winter of 1844, I promulgated my views on the potato rot and the remedies for it. I have heard of many cases which supported these views, and although I have sought diligently, I have not heard of a single one where the remedies suggested were tried without effect; but, except in the following two cases, I have not been able to obtain such minute and authentic details as would warrant me in giving them general publicity. The first case is that of Levi Bartlett, of Wamer, New Hampshire, whom you will know as a most straightforward, respectable, and intelligent farmer in that section. He informs me that he suffered very much by the potato rot in 1844. In 1845 he manured as usual; cut out all the sound pieces he could pick from his rotten potatoes, and planted them. Having read Mr. Teschemacher's articles on the causes and remedy for this disease, he made a mixture of equal parts of lime, salt, and ashes; at the first hoeing, when the plants were a few inches high, he put a large ladle-full of this mixture to each hill, and incorporated it thoroughly with the soil, which is light and stony, from a granite disintegration. He has not had, until the present time (March, 1846), twenty rotten potatoes in the whole crop; most of his neighbours have lost the greater part of their potatoes by the disease. He attributes his escape to the mixture above applied.

“ The second case is that of Matthew Green, of Roxbury, a most honourable and intelligent man. In 1844 he bought very cheap a quantity of damaged glauber salts, and, as matter of experiment, advised to try it. His account is as follows:—

“ ‘ West Roxbury, March 17.

“ ‘ My potatoes the last year (1845) were planted the 24th of April, upon ground (a little more than an acre) naturally wet and springy, but which I had thoroughly drained the year previous—a good soil, but very full of small stones. The manure was taken from the barn-yard, long and unrotted, and dropped by the fork in the furrows; the sets were taken from good potatoes, cut in halves, and, after being rolled in ground plaster, were dropped upon the manure, two in each hill, and the hills were made three feet apart each way. A sharp frost, on the night of the 24th of May, cut the tops all down. On the 9th of June, at the first hoeing, I applied a very large tablespoon-full of glauber salts and air-slacked lime, mixed in equal parts, to each plant; and this was immediately covered up with the hoe. The season will be long remembered as a very dry one, and I obtained only ninety-eight bushels from the piece; but, although the quantity was small, the quality was remarkably good, as you may satisfy yourself from the sample I send you. They were kept shaded from the sun as much as possible while being dug, and have been kept in a bin, in my vegetable cellar, out of the way of frost. The rot has been prevalent in my neighbourhood, and of the crop in the next field a large proportion has been lost.’ [Does this show atmospheric influence?—J. E. T.] ‘As it was owing to your suggestion that I first used the salt, I should have given you the result before, but I thought it most prudent to wait until the case was placed beyond doubt.’

“ I think it not improbable that this disease may be

exhausted, and not again appear; but when I call to mind the small fungus which, as you know, has for years infested and destroyed the St. Michael's pear, I should be unwilling to act on that idea, when so simple a remedy as salt and lime would seem to be effectual. If this information be promulgated without delay, I think it may decide many on your side of the water to apply the remedy. I have now spent much time, for two years, examining this disease, and should certainly change my opinion immediately if I could find it wrong. I have not the least doubt that the *cause* of this disease

is the vegetation and propagation of a minute fungus on the walls of the cells of the potato near its stem—that it first attacks the stem, and passes down into the tube—that the spores of this fungus are *now* disseminated generally throughout the atmosphere and on soils, and that the only remedy is to render the potato unfavourable to their germination by the application of salt, lime, and various chemical salts: of the effect of this remedy I have seen reported several examples, and the two preceding ones have finally fixed my opinion." —Morning Chronicle.

ON THE UTILITY OF MOLES.

SIR,—Some few years since, I sent to the *Penny Magazine* the result of some observations and experiments I had made on the usefulness of moles, which the editor very kindly inserted, and I had the satisfaction of seeing copied into many other publications. I promised also, at the same time, to write again on the subject, should I obtain any additional or confirmatory information: but as that periodical has now ceased to exist, I should be obliged if you would do me the same favour, and insert this letter in the *Farmer's Magazine*. I am the more anxious for you to do this, because by that means it will be read by the gentlemen of the Great Oakley Farmers' Club, of which I myself am a member, and several of whom have adopted my views.

In the communication to which I have alluded I shewed, and I think satisfactorily, to many the folly and wanton cruelty of destroying irrational living creatures without previously having endeavoured to ascertain for what purpose they were created, being convinced myself that "nothing was made in vain;" but I confined my objections chiefly to the destruction of moles. Without, I trust, being an enthusiast in a wrong sense, I will observe that I myself kill nothing, not even what is called vermin, but rats and mice; and even them I should not have occasion to destroy, if my neighbours would leave things as God had made them, and not kill polecats, weasels, hawks, and owls. But then they tell me that these things are vermin, and if they did not destroy them, they would eat up their poultry and game. To some extent this excuse may seem to be tenable, and I will give them the full benefit of it; I will grant that polecats, weasels, and hawks, at least, are fond of ducklings, chickens, and game: but I can give examples of individual farms at which rats and mice in a single year have done more injury than the profits of all the poultry yards in my parish would repay in twenty; but rats are as fond of young chickens as

the most voracious polecats, and the very last brood of ducks I ever had was carried away by them; indeed, they are truly vermin, and nothing comes amiss to them from an egg to a gosling.

But two years ago, I had a stack of wheat which I could not thrash out for want of barn room; it became full of mice, so much so, that it stunk of them all over my premises, and with all my efforts I could not destroy them. But one evening I caught a fresh servant-man I had, lying in a ditch, near the stack of wheat, with a gun before him; and on my asking him what he was about to do with it, he said he had seen two "mouse-hunters" (weasels) about the stack, and he was trying to shoot them, as they were always killed where he lived before he came to me. I, of course, took the instrument of death from him, and locked it up. Some time afterwards I took the stack down: it exhibited sad havoc and destruction, the middle being all eaten away; but two live mice at the very bottom alone were found, but there were several dead ones, and several dead birds, which the weasels had killed, and carried in, but not eaten; so completely had the weasels done their work!

But my object in troubling you is to write about moles. Prior to my coming to reside in my parish, the land I occupy had been for many years in the occupation of a very old man, who, like most others, was a determined enemy to every living creature of which he, in his ignorance, could not discover the benefit; but especially his enmity, or rather ignorance was directed against moles. In my barn, as a kind of heir-loom, hung a bundle of mole traps, which I at once consigned to the fire; then came the mole-catcher for his salary, as he caught my moles, he said, by the year. I paid him his money, and made him stare like a lunatic when I told him, rather than kill them, he would do me a favour if he would bring me a cart load of live moles, and turn them down in my fields. But my fields, being near a village where rooks could not

come, swarmed with wire-worms: every year one-third of my crops were quite destroyed by wire-worms, and sometimes much more; one long narrow field surrounded with trees was nearly useless from them. But at length relief came; I had long hoped to see my favourites the mole-heaps, and at length, as if by a simultaneous agreement, that little long field was full of moles, which set to manfully upon the destroyers of my crops, and after some time completely destroyed them. They then passed over into my next field, one-third of which had been worse than useless to me from the same destroying pests, even since I had had it; but these in their turn shared the fate of the others. I now verily believe I have not a wire-worm in my fields; and as the moles have entirely done their work, unsolicited, they have gone off to my neighbours with the same good intentions to them as they had to me; but I fear their fate with them will be different to what it was with me: whilst with me, it was delightful to see their works in those parts of my fields where their presence was wanted; where there were worms, and where my crops were destroyed, there were the moles at work; and where there were no wire-worms, there were no mole-hills.

And now to the excuses which farmers make for destroying them. The first of these is, that the mole-hills look unsightly; and the second, that the moles injure the crops. Now, as to the unsightliness, I wish farmers had nothing more unsightly than mole-hills: to see all the essence of their manure heaps running down ditches into the nearest brooks, is a thousand times more unsightly to me than a whole field full of mole-hills. And as to the injury that moles do to corn, I can affirm positively that they do none whatever. I have had a field of wheat full of moles all the year, without doing it the least possible injury; but on the contrary, I verily believe that up to harvest they did my crop good. Again, it is said that moles eat the seed-corn; but this again is a mistake, for I have examined the stomachs of scores, but never found a single grain of corn in one of them.

It is said, and I believe on good authority, that 60,000 bushels of seed-corn are annually destroyed in this country by wire-worms; how absurd, therefore, is it to bowstring moles, which are evidently designed by a wise and kind Providence to keep them down! Last year I had one of the finest crops of wheat in this neighbourhood, in a field which but for my moles would not have been two-thirds of a crop; and this year I have the finest possible appearance for a crop in the aforesaid small field, which years ago, when full of wireworms, would have been nearly destroyed. But should any of my neighbours still be sceptical, I hope they

will examine my fields: and should any strangers be so, I hope they will make the same trials for themselves as I have, and be convinced.

In conclusion, Mr. Editor, I wish further to add, for the information of horticulturists, that ants live upon the aphid, or American bug, and therefore that it is nearly as great a want of wisdom to irradiate ants from orchards as it is to kill the moles in fields.

I am, sir, your obedient and humble servant,

Geo. WILKINS.

*Parsonage, Wix, near Manningtree,
April 22, 1846.*

PARLIAMENTARY PAPERS.

HOUSE OF LORDS.

WHEAT AND FLOUR.—A return of the quantities of wheat and wheat-flour imported, exported, and retained for home consumption during each year from 1815 to 1845, inclusive; also the quantity remaining in bond at the close of 1845; and the annual average prices of wheat for the same period. The following is an abstract of the results:—

Years.	Average price per qr.		Imported.	Exported.	Retained for home consumption.
	s.	d.			
1815	63	8	384,475	227,947	116,382
1816	76	2	332,491	121,611	225,263
1817	94	0	1,089,955	317,524	1,024,443
1818	83	8	1,694,261	58,668	1,596,511
1819	72	3	625,638	44,689	122,000
1820	65	10	996,479	94,657	34,275
1821	54	5	707,385	199,846	9
1822	43	3	510,602	160,499	2
1823	51	9	424,019	145,951	12,137
1824	62	0	441,591	61,680	15,778
1825	66	6	787,606	38,796	525,231
1826	56	11	897,127	20,054	315,892
1827	56	9	711,868	57,323	572,705
1828	60	5	1,410,300	76,489	841,828
1829	66	3	2,190,095	75,097	1,363,847
1830	64	3	2,205,751	37,149	1,700,548
1831	66	4	2,867,860	65,875	1,487,807
1832	58	8	1,254,351	289,558	375,788
1833	52	11	1,166,457	96,212	83,691
1834	46	2	981,486	159,482	64,552
1835	39	4	750,808	134,076	27,525
1836	48	6	861,156	256,978	30,096
1837	55	10	1,109,492	308,420	242,593
1838	64	7	1,923,400	158,621	1,821,151
1839	70	8	3,110,729	42,512	2,652,552
1840	66	4	2,526,645	87,242	2,284,522
1841	64	4	2,910,263	30,390	2,515,597
1842	57	3	3,118,833	68,047	2,826,156
1843	50	1	1,482,988	71,236	965,289
1844	51	3	1,761,031	80,800	951,882
1845	55	10	1,912,674	64,961	308,492

The quantity of which remaining in bond at the close of the year 1845 was 1,106,874 qrs.

THE LONDON FARMERS' CLUB.—MONTHLY DISCUSSION.

THE ECONOMY OF MANURES—THEIR MANUFACTURE AND APPLICATION.

The usual Monthly Meeting of the Farmers' Club was held on Monday evening, 4th May, in their rooms, at the York Hotel, Bridge Street, Blackfriars.

Mr. BAKER, of Writtle, Essex, occupied the chair, and stated that the subject of their discussion for this evening was "The economy of manures, as regarded their manufacture and application." At the time the matter had been selected for discussion, Mr. Cuthbert Johnson, who, from his scientific acquirements, was more conversant with all its bearings than any other member, had been requested to take the lead in the question, and he had very handsomely condescended to do so (*hear*). He was quite sure they would listen to him with a vast deal of pleasure, and be highly gratified in having a gentleman of such distinguished talent to bring the question before them; for they must all be interested in the chemical analysis of substances relating to agriculture, and in the preparation of manures for the improvement of the soil (*hear, hear*).

Mr. CUTHBERT JOHNSON immediately rose, and said—Mr. Chairman and gentlemen, I respond to the call made upon me to bring the subject of this evening's discussion before you with every possible feeling of alacrity (*cheers*); but I wish to state at the beginning that when the card was put into my hands, and when I came to examine the terms of the question, I was rather puzzled as to how I should best direct my attention to the subject. My difficulty arose not from a feeling that I should not find enough to say upon such a subject, but rather in arranging it so as to bring it within the limits of any ordinary discussion of this club. According to the terms in which the question is drawn up, the economy of manure is made the leading part of the subject. Now, that, if strictly construed, takes in the whole subject of manures, and includes the examination not only of organic manures, but those of a mineral or permanent nature, saline manures, those which are applied by the drill, and those of a liquid nature. Finding, therefore, it impossible to enter thus fully into the merits of this important theme, I resolved to confine myself to the preparation of farm-yard manure, because I thought that this was a question of the most vital importance to every farmer, and concerned the interests of every occupier of the soil throughout the country. For although some have the power and the intelligence (and that is not a small number) to employ fertilisers of an artificial nature, every one has the farm yard, and the valuable contents of the farm yard; and any suggestion which I could offer which would excite discussion, and any advantage which might be derived therefrom, I knew would be spread into the remotest parts of the kingdom (*cheers*). The subject is, in fact, of equal importance to those who only hold one field, and to those who hold their fields by the hundred. Therefore, by your permission, I will confine myself to

the consideration of the manure of the farm yard, its economy and application (*hear, hear*). The question then, gentlemen, which the Committee of the Farmers' Club have adopted for discussion this evening is one which they have justly considered to be of the highest practical importance, a conclusion in which I beg most warmly to concur, because it must be quite evident to every one connected with the cultivation of the soil, that upon the proper manufacture and the economical application of the manure of the farm yard rests the success of all great agricultural efforts. It is with much pleasure, therefore, that I take upon me the task of opening such a discussion; and I do this not with the feeling that I can propound any new discoveries of startling importance, but with the anxious diffidence, which must be felt by every one who addresses, on any agricultural subject, the great and accomplished farmers who grace the list of this influential and highly important club (*hear*). My attention this evening shall be directed to a few chemical results which have been recently obtained, relating to the subject, and to the illustration they afford of the farmer's practical operations. The subject of this evening's discussion having been divided into two sections, the "manufacture" of the manure of the farm yard first demands our attention. We shall, in furtherance of our object, simplify our investigation, if we divide this examination into two sections—First, the vegetable portion of the manure, and, secondly, that which is composed of the excrements of animals. Now, as regards the vegetable portions, it is evident to every one that it is the straw of various grain that forms the largest portion of these—substances of little value as fertilisers, until mixed with the excrements of animals. It has been found, however, that the same quantity of the straw of different cereal grasses, consumed as food by live stock, produces very different weights of manure. This is of the highest importance to be known. It has been a common phrase that "straw is straw," and many do not know that if a given weight of rye straw, or hay, or corn is used, there is a material difference in the weight of manure produced, as has been determined experimentally by M. Block. He ascertained that 100 lbs. of chopped rye straw, given as food to horses, will yield about 42 lbs. of dried excrements (fluid and solid), 100 lbs. of hay will yield about 45 lbs., 100 lbs. seeds of oats 51 lbs., 100 lbs. seeds of rye 53 lbs. The proportion of excrement produced by various animals naturally varies with the size of the animals, and the food on which they are fed; but it has been calculated from results of various experiments that an ordinary bred cow, fed in the usual way, produces about nine tons of solid dung in the course of the year. Upon this part of the subject you will find much valuable information in a blue book recently printed by the Government, the real object of which is to support

the continuance of the Malt Tax, with the ostensible one of affording information to the farmer. Throwing, however, to the winds the real object for which the volume has been published, and the arguments it is intended to support, to which a complete answer might readily be found; throwing to the winds, I say, that object, there yet remains in the hundred folio pages of which the book consists, a great deal of instruction, highly valuable to the accomplished agriculturists of England. I therefore recommend those who are managers of Farmers' Clubs to apply to the proper office, and they will doubtlessly be furnished with a copy for the use of their institutions; a book so full of valuable information, relative to the respective qualities of excrements, that it will well repay a perusal—I mean in a scientific point of view, and not as having any relation to the Malt Tax (*hear, hear*). In the recent experiments of Dr. Thomson upon the fattening properties of malt and barley, he found that in fourteen days a cow, consuming 1426 lbs. of grass, produced exactly 1000 lbs. of dung.—(*Parl. Paper*, p. 45.) But when the same cow was fed for sixteen days on 3 lbs. of barley, 168 lbs. of malt, and 472½ lbs. of hay, she produced 1259 lbs. of dung.—(*Ibid.*, p. 47.) Again, the food of this cow was varied; she was fed during ten days with 90 lbs. of barley, 27 lbs. of molasses, and 274 lbs. of hay: the dung she now produced weighed 866 lbs.—(*Ibid.*, p. 49.) She was then fed for ten days with 80 lbs. of barley, 40 lbs. of linseed, and 249½ lbs. of hay, she now produced 785 lbs. of dung.—(*Ibid.*, p. 49.) This gives the proportion of solid excrement voided by a cow. M. Bousingault has experimentalized upon the same subject, as may be seen from the following table of the component parts of the food consumed by and of the excrements of a horse and a cow, during twenty-four hours (*Liebig's Organic Chemistry*). The weights in this table are given in grammes—a gramme being equal to 15·44.

Articles of Food.	Weight in fresh state.	Weight in dry state.	Carbon.	Nitrogen.
BY THE HORSE.				
Hay	7,500	6,465	2961·0	97·0
Oats	2,270	1,927	977·0	42·4
Water	16,000	..	..	..
Total	25,770	8,392	3938·0	139·4
Total excretions in same time	15,580	3,827	1472·9	115·4
BY THE COW.				
Potatoes	15,000	4,170	1839·0	50·0
After grass	7,500	6,315	2974·0	151·5
Water	6,000	..	..	..
Total	82,500	10,485	4813·4	201·5
Total excretions in twenty four hours	45,152	6111·4	2601·6	174·5

Other persons have, in various experiments, investigated the amount of dung produced from a given weight of food and fodder taken together, and the results of one of these series of experiments have been given by Professor Johnston, in his valuable work, "The

Elements of Agricultural Chemistry," p. 140. From these it appears that one ton of dry food and straw gives a quantity of farm-yard dung, which weighs,

When recent, from.....	46 to 50 cwt.
After six weeks	40 to 44 "
After eight weeks	38 to 40 "
Half rotten.....	30 to 35 "
When pretty rotten.....	20 to 25 "

So that we see from these experiments that when only half rotten, farm-yard dung does not weigh more than one half of what it does when in the recent state. This loss of weight is caused partly by the evolution of a quantity of the gaseous matters of putrefaction, and partly by the aqueous matter drained from the heap, or emitted in the shape of steam; a loss which can easily be diminished in amount, although not prevented even then in a considerable degree, by employing the manure of the farm yard in as recent a state as possible. The condition in which manure ought to be applied to the land, in what state of putrefaction or decomposition, is a point of the very highest importance, one well worthy of investigation by this society, and upon which the more knowledge there is brought to bear the better (*hear, hear*). There is a very practical question, namely, the state in which the farm yard should be kept during its manufacture, and as to the value of the resulting compound produced. A great many of the farmers in my neighbourhood, in the county of Essex, believe that the farm-yard cannot be kept too dry; and that was the opinion of a great farmer in Dengy Hundred, a tenant of the celebrated Mr. Cline, the surgeon, for he covered in the whole of the farm yard with a roof. He, therefore, was clearly of opinion that to have manure in as dry a state as possible was most productive, and that it insured a manure of the most fertilising description. Others, however, are of a very different opinion (*hear, hear*). This leads me to another portion of the inquiry, as to the most desirable state of dryness or of moisture in which the dung of a farm yard can be kept while preparing. On this important point I have received very discordant opinions from practical farmers: many contending that it can hardly be prepared in too dry a state; whilst others have stated to me as their decided opinion, that if the escape of all *drainage* from the farm yard is prevented, that then the dung can hardly be kept too wet. There is certainly in favour of this latter conclusion the results of some recent experiments by the celebrated German chemist, Sprengel, which would lead to the conclusion that at least the putrefied urine of the farm yard becomes very considerably richer in ammonia when previously mixed with a considerable portion of rain water. This discovery shows the value of experiments, even when it may be thought that those researches can hardly lead to much good. For if any chemist had been asked, if by mixing a quantity of water with urine and then putrefying it, such a process would add to the bulk of ammonia, that chemist would most unhesitatingly have answered, "No." But that it does increase the bulk of the ammonia, and that not to a small, but to a very considerable extent, is beyond dispute (*hear, hear*). Now, upon the

quantity of ammonia contained in farm-yard manure, its fertilising powers to a very considerable degree depend. M. Sprengel analyzed urine in three different states—1. When fresh. 2. After being putrefied by itself. 3. After being putrefied and previously mixed with its own bulk of water. When fresh, 100,000 parts he found to contain 205 parts of ammonia; but after putrefaction this proportion of ammonia was increased to 487 parts, or considerably more than doubled; and when watered previously, it was then found to contain, after putrefaction, 1622 parts of ammonia, or nearly eight times the quantity it did when fresh. The following are the results of his analysis:—

	Fresh.	Putrid.	Watered.
Urea	4,000	1,000	600
Albumen	10	..	..
Mucus	190	40	30
Benzoic acid	90	250	120
Lactic acid	516	500	500
Carbonic acid	256	165	1,533
Ammonia	205	487	1,622
Potash	664	664	664
Soda	554	554	554
Silica	36	5	8
Alumina	2	..	..
Oxide of iron	4	1	..
Oxide of manganese	1	..	..
Magnesia	36	22	30
Chlorine	272	272	272
Sulphuric acid	405	338	332
Phosphoric acid	70	26	46
Acetic acid .....	..	1	20
Sulphuretted hydrogen .....	..	1	30
Insoluble earthy phosphates and carbonates } ..	..	180	150
Water	92,624	95,444	95,481
	100,000	100,000	100,000

These experiments seem to me to bear directly upon the question of the dry and wet preparation of manure—a point so important to be well understood that I should be glad to hear the opinions of those who will follow me in this discussion upon it. The more carefully in fact that we investigate the question which is the subject of this evening's discussion, the more important does it appear, and the more numerous the sources of loss to be guarded against. For, as I have elsewhere remarked—Nothing appears at first sight so simple as the manufacture and collection of farm-yard dung, and yet there are endless sources of error into which the cultivator is sure to fall if he is not ever vigilant in their management. The late Mr. Francis Blakie, in his valuable little tract upon the management of farm-yard manure, dwells upon several of them; he particularly condemns the practice “of keeping the dung arising from several descriptions of animals in separate heaps or departments, and applying them to the land without intermixture. It is customary,” he adds, “to keep the fattening neat cattle in yards by themselves, and the manure thus produced is of good quality, because the excrement of such cattle is richer than that of lean ones. Fattening cattle are fed with oil cake, corn, Swedish turnips, or some other rich food, and the refuse and waste of such food

thrown about the yard increases the value of the manure; it also attracts the pigs to the yard; these rout the straw and dung about, in search of grains of corn, bits of Swedish turnips, and other food, by which means the manure in the yard becomes more intimately mixed, and is proportionately increased in value. The feeding troughs and cribs should, for obvious reasons, be shifted frequently. The horse dung is usually thrown out at the stable doors, and there accumulates in large heaps. It is sometimes spread a little about, but more generally not at all, unless where necessary for the convenience of ingress and egress, or perhaps to allow the water to drain away from the stable door. Horse-dung lying in such heaps very soon ferments, and heats to an excess; the centre of the heap is charred or burnt to a dry white substance, provincially termed *fire-fanged*. Dung in this state loses from 50 to 75 per cent. of its value. The diligent and attentive farmer will guard against such profligate waste of property by never allowing the dung to accumulate in any considerable quantity at the stable doors. The dung from the feeding hog-sties should also be carted, and spread about the store cattle yard in the same manner as the horse dung.”*

I have ventured to read the remarks of Mr. Blakie, because they come from a man who was a thoroughly practical farmer, and in the district in which he long excited considerable attention and exercised very great influence he did more for improving the preparation of the manure of the farm yard than any other man in the north of Norfolk (*hear, hear*). I do not think it desirable in this discussion to attempt to exhaust the widely extending theme now before us. There are many questions regarding the economical manufacture of manure, which can hardly be comprehended in one evening's discussion. Of this class is the enlargement of the bulk of the farm-yard compost by mixing it with peat, tanners' bark, and other slowly decomposing vegetable substances; a practice very advantageously followed in favourable localities, and easily available by the Lancashire farmers where they have access to the extensive cesspools of the manufacturers, yet the practice does not come within the reach of the majority of the farmers of England. As to mixing these substances with ordinary manure, I think there are considerable doubts whether the practice has ever answered the purpose of those who have employed it. I therefore, from the causes I have assigned, venture to leave these branches of the inquiry out of this evening's discussion, and pass on to a still more important branch of the subject, viz., the enrichment of the farm-yard manure by improving the food of the live stock kept in it. This is a question peculiarly interesting not only to the tenant farmers, but

* There is no doubt of the superior fertilizing effects of horse dung. In an experiment with beans, in which six acres were manured with horse dung and nine with that from a cow-yard, the six yielded more beans than the nine (*Agri. Report of Essex*, vol. ii., p. 280). The same observation was made in Lincolnshire (*Sinclair's Agriculture*, p. 214). The heat produced by the fermentation of the dung of different animals has been made the subject of repeated experiment (*Farmer's Magazine*, vol. iv., p. 160). When the temperature of the air was 40 deg., that of common farm-yard dung was 70 deg.; a mixture of lime, dung, and earth, 65; and a mixture of swine and fowls' dung, 58.

to the farmers' landlord. For when it is generally known amongst the landlords of England how much the quality of the manure is improved by the use of superior food, they will then see very speedily that it is the most wretched policy to discourage, or restrain, by a covenant in the lease, the exchange of straw and hay, for good dung made by corn-fed animals, one which in very many instances the farmer could effect with equal advantage to his own pocket and to the high cultivation of his land. Now the questions of the highest importance which are originated and discussed by this club are questions which should aid in the diffusion of knowledge not only among the farmers of England, but among the farmers' landlords; because I am perfectly aware that whatever goes on in this club, will, through the usual public channels, find its way into their studies; and I hope that every niggardly landlord in this country (that is, supposing that such a person as a niggardly landlord does exist in England)—(*hear, and a laugh*) will consider whether it will not tend to the eventual enrichment of his own pocket if he omit all covenants from his leases which prevent the farmer from exchanging straw or hay for far better manure than he can readily make, and whether it would not be to that landlord's own interest to increase the quality of the manure now made in the straw-yard by the employment of oil cake and other food which would produce manure of a highly superior nature (*hear, hear*). Of course, when the landlord is once convinced of the soundness of this policy, this result will follow; he will take care to have no covenant introduced in his leases which will militate against such a practice, but see that if the tenant has not, by the custom of the district, a right, to be paid for any outlay for oil cake, such a custom ought at once to be adopted; and if he cannot prevail upon his fellow landlords to give to their tenants what for shortness are called "rights," that he will at least provide that his own out-going tenant shall not be discouraged from employing oil cake manure, from the fear that when he leaves his farm he will not be compensated for it. I earnestly hope these discussions will lead to a better general feeling on this subject on the part of landlords, and lead them to perceive that the more liberally they agree to pay their tenants for any unexhausted improvements with regard to manure, the better it will be for their own interests (*hear, hear*). Gentlemen, I was just saying that it was the most wretched policy to discourage or restrain by covenants in the lease the exchange of straw and hay for good dung made by corn-fed animals, and I need hardly remind the farmers assembled in this room of the inferiority of the manure made by the lean stock of the straw yard to that produced by the corn or cake-fed stock of the stable or the bullock-houses. The increased value of manure made by stock fed with oil cake is considered by the farmers in my neighbourhood in Essex to be equal to one-half of the oil cake employed; and so well convinced of the importance of encouraging the farmer to enrich the manure of the farm yard are Lord Yarborough and many other of the great and enlightened landlords of Lincolnshire, that they have wisely encouraged their excellent tenants to use oil cake, by allowing them for one quarter of their outlay for all the cake used for fattening their stock during the two last years

of their tenancy (*hear, hear*). They wisely avoid the error into which by far too many landlords are at present led in the valuation of the manure belonging to an out-going tenant, viz., that of regarding as of little consequence the quality of the food consumed by the stock which produced it; a delusion which I hope will speedily pass away when the landlords of England shall better understand, as regards the preparation of manure, their own true interests (*hear, hear*). To assist in this very desirable object, I would earnestly refer the landlords to a very valuable paper, which both the farmer and landlord can hardly read too often, by Mr. Williams, Lord Yarborough's agent, on "The Tenant's Right to Compensation for unexhausted Improvements;" for its perusal will not only suggest several acts which it would be well if those connected with the tenure of land more constantly kept in view, but it will also give valuable support to one of the questions I am so anxious to impress upon the farmers of England, viz., the false economy of preparing only straw-fed manure. Mr. Williams's paper is inserted in the "Journal of the Royal Agricultural Society of England," vol. vi., p. 44. He remarks, when speaking of what he well describes as the increasing importance of the subject, "The allowance (founded not on custom, but on special agreement) is based on the assumption that the manure is improved to the extent of half the value of oil cake consumed; but to get a fair average of both quality and price it is made to extend over the last two years, and the allowance is two-sixths of the cake used in the last year, and one-sixth of that used in the previous year, making together the half of a year's consumption." This clearly shows that among the noblemen and gentlemen to whom I have alluded no doubt is entertained of the advantage of encouraging an improvement in the quality of the manure of the farm yard (*hear*), and I think it is a question which can hardly be discussed too often, or be too frequently brought under the attention of the landlords (*hear, hear*). Having thus rapidly glanced at some of the chief sources of improvements to be adopted in the manufacture of manure, the next division of my subject includes, according to the terms of this examination, the economy of its application. This is a division of my subject which is of the highest importance to the cultivator; it is one great branch of the farmer's endless avocations in which great losses are necessarily sustained, yet still more are incurred by needless neglects and want of consideration (*hear, hear*). For amongst the many sources of loss, we find that in too many instances the application of the manure is delayed until putrefaction has generated and evolved a large portion of the richest ingredients of the manure. Surely in many instances this loss might be prevented, but the practice unfortunately does not end here; the manure is carted from the compost heap, copiously emitting a stream of gaseous matters, which would if evolved in the soil prove highly fertilizing to the growing crops (*hear, hear*). Its exposure to the atmosphere, when spread over the land, adds still more to the mischief; the sun and the winds conspire to reduce its value, until, when it is at length ploughed beneath the surface, its best, its most fertilizing portions have departed; and if this is the loss sustained by manure applied

to arable soils, how much is that loss multiplied when the compost of the farm yard is spread over the surface as a top dressing to grass lands! How small a portion is absorbed by the growing crop, how large a portion destroyed by the combined action of the sun and the atmosphere! Now it appears to me that a remedy may be found for this loss; some implement surely can be produced, somewhat similar to the sub-turf plough, which shall by some simple improvement enable the holders of pasture lands not only to loosen the soil of grass lands, but, at the same time that this beneficial operation is effected, to deposit either well rotted compost or some of the drill manures beneath the surface of the land. By this plan the decomposition of the manure being rendered much less rapid, and applied in immediate juxtaposition to the roots of the grass, its elements are as gradually absorbed and assimilated by the growing plants as they are produced; protected from the action of the sun and winds, every product of decomposition is turned to good account, and consequently a much smaller portion of the fertilizer employed is needed to produce a required result than by the common wasteful mode of spreading it on the surface, even aided as it commonly is by the very imperfect and ineffectual attempts to bush-harrow or roll it into the land. By such a mode of application too as that to which I have alluded, the use of the manure is very materially economized, for it is a means of extending a given weight of manure over a much more considerable extent of land than is practicable on the ordinary surface-dressing mode. And when we reflect upon the small proportion per acre of bone dust, of rape cake, and of other finely divided organic fertilizers, which are successfully applied by the drill, we can hardly avoid the conclusion that it is more than probable that by new and more economical modes of application great improvements are yet to be made in respect to the use of farm yard manure (*hear, hear*). I have been induced to lay great stress on the wasteful application of farm yard manure when used as a top dressing for grass, by having my attention drawn to the wasteful manner in which such manure is applied in my own neighbourhood. It is brought down from London in large quantities, and after being put in a pile and turned over is then spread upon the land; the attention of those who are farmers and of those who are not is drawn to it by the odious stench which it emits (for it is mixed with a great quantity of the night soil of London an admirable dressing for grass lands) and they are soon acquainted through their noses that an agricultural operation is going on (*hear, and a laugh*). This smell shows that a mixture of ammonia and sulphuretted hydrogen is being evolved from the manure, which by being dispersed is lost to the land, and lost to the grass, to which it is naturally so admirable a food (*hear, hear*). Now, if that ammonia, that sulphuretted hydrogen, could by any process be brought under the surface, the roots of the grass would absorb it as it was evolved, decomposition would be retarded, the gas would be evolved more slowly, and consequently evolved in such quantities as are not beyond the powers of the growing crops to consume. I therefore venture again to suggest that surely some implement may be constructed, that something like the

sub-turf plough might be contrived, which would not only loosen the soil (a most excellent operation in the case of grass lands), but should also at the same time bring and bury under the surface the well rotted manure of the farm yard—some of which might be prepared on purpose for the operation; and although it is commonly believed that organic manures must, to produce beneficial results, be strewed on the land in large quantities, yet long continued experiments have convinced me that the usual amount of organic manures, may, to the interest of the farmer, be very materially reduced in bulk (*hear*). I am quite sure indeed, from experiment, that the application of manures to grass lands in particular may be very materially improved in the way I have suggested (*hear, hear*). I have, Mr. Chairman, thus rapidly touched upon the chief points in the manufacture and economy of farm-yard manure which appeared to me to be most likely to be productive of good in a discussion by the members of the Farmers' Club, and I trust that these imperfect observations will be the means of drawing forth the practical observations of those whom I see around me. The importance of the subject, I feel, can hardly be overrated; it branches out into so many divisions, that I have ventured to touch upon one or two only, leaving it to others to enlarge upon my imperfect notices, and to supply my manifold omissions. In conclusion, I have only to thank the members of this club for listening so patiently to me during the time I have occupied their valuable attention, and if the observations I have made should have the effect intended, *viz.*, that of drawing forth the remarks of the able practical men present in this room, my very humble efforts will be most abundantly rewarded (*loud and hearty cheers*).

After a short pause,

The CHAIRMAN rose and said, Gentlemen, as you seem at the present moment to be at a stand still upon the subject which Mr. Johnson has so ably opened to us, I will take this opportunity of offering a few observations (*Hear, hear*). That gentleman has given us what I think may be called a scientific account of the matter before us. But there is one other view in which farmers must regard the subject, namely, the practical manner of carrying it out; and perhaps when these two views are brought into contact and considered together, something more beneficial may be devised than by considering either separately (*Hear, hear*). I have long been in favour of the principle of using raw manure; indeed, I was the first to start it in my own neighbourhood, where it is of 25 years' standing (*Hear, hear*). It had always been my custom to compost the manure, turn it over and over again, and then clamp it with perfect neatness, so that all the valuable qualities were retained. By putting a sufficient quantity upon the land I got very good crops, but, at the same time, at a vast expense of material. This was obvious to me upon experiment. In the first year I put equal quantities of good composted manure, reduced 50 per cent. by composting, and which ought to have contained double the fertilizing properties of that which was not so composted; but, upon applying 20 loads of manure, merely thrown up to get into better mixing order, I found that an equal

quantity of this manure taken from the yard produced a better crop of turnips than that which had been composted (*Hear, hear*). In the one case I was manuring with half the quantity that I was applying in the other (*Hear*). We all know very well that any new modes of application in farming are always received with doubt. Now, I mentioned this matter at our parish meeting, and at our little convivial meetings, and I found that it was generally disbelieved. I invited a number of gentlemen to come to my house and judge for themselves, some of them saying it might be beneficial for turnips. Well, a party came, and the result was, that they were quite satisfied that the succeeding crop was better with long manure than with composted (*Hear*). At my farm I have not to remove a load of manure. I still retain it in the yard, and shall do so until I require it for the turnips. I am now feeding on green food, and the manure is making in a ten-fold degree as compared with winter when we fed with turnips; all the droppings are retained upon it, and it is highly benefited thereby. The main object is just to keep it moist enough to prevent its getting into that dry state which Mr. Mechi advocates, as alluded to by Mr. Johnson. I do not mention it to that gentleman's prejudice, for he has manifested talents and energies which would be exhibited by very few emerging as he has from the shop. I have great respect for him; he has certainly directed his energies very beneficially; but, at the same time, upon the point of keeping manures in a dry state, I must beg to differ from him (*Hear*). When so kept, all the most beneficial parts pass off in gas. I always found that to be the case with the clamps if carted out in a dry state; there is, in fact, very little good in it as compared with manure in a moist state. As far as I can form an opinion, with my little scientific knowledge, I attribute it to this—that the ammonia is not so likely to be volatilized when fastened down as when it gets into a state of fermentation (*Hear*). Immediately upon manure getting into a state of fermentation decomposition goes on rapidly, and the ammonia fast passes off. But if you can keep it in a consistent state, you will lose none of those parts which would otherwise fly off in fermentation or in a volatile form (*Hear*). Before using manure for turnips, I throw it up in heaps in the farm yard, and these heaps soon enter into an active state of fermentation; and my main object is to cover it over as quickly as possible after removing it. In that way I do practically what Mr. Johnson has pointed out to you scientifically. The covering it over is of very great importance, for the eyes and the nose tell you that the gas is passing off very rapidly, and the sooner you fix it the better (*Hear, hear*). You all know practically that it is very inconvenient for manure to remain in the farm yard in a solid state. The question then is, what is the best mode of applying it to the crops? My opinion is, that it is better to cart it out, not in too dry nor too wet, but in a medium state, and to cover it closely over with earth; immediately upon being deposited it should be turned over and covered completely with the soil. Another method is to turn it out upon the land, drive the cart over it, in order to consolidate

it with the soil; and then stir it over, in order to get it into an active state of fermentation. This is a simple process of applying manure to the land; and it was the best we could adopt under the circumstances. The gentlemen present will no doubt give us their different views upon the subject; and it is by discussions of this description that we arrive at proper conclusions. For my own part I am quite satisfied that the system of making manure under cover will never answer. I happen to be intimate with the person who manages the farm alluded to by Mr. Johnson, where a spacious yard is all covered in, and I know that in spring and summer there is too much dryness; the manure does not get into a state of fermentation, nor remain in that consistent state which is necessary to preserve the gases (*Hear*). I think it is quite unnecessary to have any buildings in which to make manure; it can be made in the best possible condition without them. I had an opportunity of inspecting Mr. Cline's farm yard, and I could see the liquid manure coming down and running off very copiously. I joked him upon it; and his reply was, "We have got so much we cannot help it." I do not approve of manure tanks; if you convey the water from the buildings by troughs, or by under ground draining, there will be no necessity for manure tanks. I am indeed quite opposed to the use of manure tanks, although I have one or two myself: we have carted out the liquid manure upon the grass and arable land, but never found in the results that it was worth carting out (*Hear*). I think, however, that the fact is to be attributed to this, that we do not sufficiently prepare it previously to carting it out. It appears that in the Belgian system of farming they use a good deal of liquid manure; but the animal feces are collected, and put into the tank in the corner of the field, covered up, and kept for many months until in an active state of fermentation and the ammonia is perfectly formed; a large quantity of rape cake is also broken up, and put in as a mixture with it. Now, it appears evident to me, that we do not keep the liquid manure long enough to get into a state of fermentation, or, if I may use the term, long enough for the ammonia to become formed; if we did this, it might possess very superior fertilizing qualities. That is a subject upon which Mr. Johnson has given us some information. The application to the land of the drainings from the farm yard does very little good as at present applied; but as the Belgian farmers apply this liquid, it appears to be very beneficial. Mr. Johnson is of opinion that manure is wasted by being put to grass lands in the present mode; but there is something in the practice of applying manure to grass lands and clover which I know, although I cannot explain the reason, operates very beneficially; and at times when we suppose it would be of least benefit to the crops, it will, in the result, give the greatest (*Hear, hear*). Clover will, sometimes, under these circumstances, be produced most abundantly; and the same will take place in some cases with wheat crops in a most eminent degree. By the system which we have adopted, we generally get a fair average crop of wheat without its running to any great extent of straw, which it often does under other circum-

stances. I think manure never does so much good to grass lands as when applied immediately after the hay has been severed and carted from the field; at no other season of the year does it appear to be anything like so beneficial in its effects (*Hear, hear*). And this is not a little extraordinary, because that is generally about midsummer, when we should think that the heat of the sun would dissipate and dry up the more valuable qualities. I account for it in this way, that it gets speedily covered in and buried by the growth of the grass; and, therefore, that the greatest possible amount of the manure may be thereby retained just at that precise period. The benefit is seen to a still greater extent the next year, from the grass thus immediately receiving the manure and preparing itself for the shoot of the ensuing spring; and the result is a much larger crop of hay in the following summer (*Hear*). These are merely a few observations which I have to offer on the manufacture and economy of manure. The manufacture of manure is unquestionably a matter of the first importance in the management of a farm; and every means should be resorted to to increase the manure heap. But I scarcely go upon a farm without seeing that that is neglected, instead of any efforts being made to increase it. As far as my own practice goes, everything which can be converted into manure is brought together for that purpose; all kinds of vegetable matter, and even that which we harrow up out of the land is carted to the farm yard, rather than burnt. All are mixed up together with the dung, and help to increase the quantity of the manure. The moisture which escapes from the stable is spread over it, and the whole carted away day by day. The dung should never be allowed to accumulate at the stable door; it is better to cart it away each day than to allow it to accumulate in any particular place. Exactly the same rule should be observed with the bullock houses. We frequently see beasts kept in stalls for the sole purpose of producing manure; you may see the manure piled up all along the back of the sheds steaming away, and the ammonia passing off as fast as it can pass. Some people say it keeps the cattle warm (*hear, and a laugh*). I have heard farmers say—"I know I am giving away my oil cake and turnips, but I must make manure" (*hear, and laughter*). What is the consequence? Why, the most valuable qualities of the manure are lost. This is a very common practice, but it should be guarded against. It should each day be carted from the sheds and trodden into the land; and by nothing is this operation better performed than by a donkey, a cart, and a boy; in fact, nothing is more useful on a farm than donkeys in connection with horses. A friend of mine uses a considerable number of them; he carts his dung with these animals, and employs them in various ways; they are kept at very little expense, and as an aid to horses they are certainly very useful (*hear, and a laugh*). Throughout Suffolk the system prevails of carting out the manure into the middle of the field; I have seen masses as high as this room. From this practice the loss must be considerable. In conclusion, I hope I have said something to elucidate the matter before us, and to confirm that which Mr. Johnson has very kindly given

us; and I now beg to say that I shall be very glad to hear the opinions of any gentleman present who may have given his attention to this important subject (*hear, and cheers*).

Mr. TURNER: I did not, sir, intend to have taken any part in this discussion when I first entered the room this evening; but the subject being one to which I have devoted a great deal of study, and in which I have had some experience, I cannot refrain from offering a few observations on the practical parts of the question, to which my attention has been called upon my own farm (*hear*). It is a general rule with me to issue an order to all my men that they will make this their maxim—"Never to waste a bundle of straw, and never to want one" (*hear, hear*), which in plain English means, never to suffer a single truss of straw to be used which is not absolutely necessary, and on the other hand never to spare one when it is wanted to lick up the fluid portions of the manure (*hear*). And with regard to the management of manure, this is the plan I adopt:—Every fortnight I cart out all the different manures, from the horses, from the cow houses, from the piggeries, from the beast stalls, and, in short, every description of manure; I cart it all out, and put a layer of each upon the same heap; I then suffer the cart to be driven upon the heap, in order to press it down as tightly as possible. This done, I put a layer of earth over all, in order to prevent any of the gases from escaping from the heap; I also put something under it to prevent anything from going away below. So far I store my manure; and I continue this operation through the winter. I select some place with a hard bottom, where nothing can escape, and there the manure is deposited for the most part during the winter (*hear*). With respect to liquid manure, I for one do not see any very great good it does by being carted out upon the land (*hear, hear*). It has been my custom to have a place under the farm yard, from which all the liquid was carried over the meadows; of course you expect the land to be benefited by this liquid. Whether it runs equally or not I do not know, but not more than an acre or two are to be found better than the rest. Therefore I think that liquid manures do not do that good which many people suppose. I think it is better not to suffer anything to escape from the farm yard. In almost all farm yards there are drains or tanks, or something to catch this liquid. In these tanks it has been my practice to keep some sort of rubbish, such as the stalks of potatoes, the stalks of turnips, or the stuff cleared away from the sides of the fences, and upon all this I pour the liquid manure. I think I cannot employ a boy and a donkey better than to fill the tank with rubbish of this description; and in following this practice I take care that nothing escapes from the farm yard; everything is carted on to the mixen. If you adopt this plan, you will find that in the course of a year you will collect a vast quantity of manure from this source alone. With respect to the use of manure, and the manufacture of manure, I do not say that mine is the very practice which ought to be resorted to; I only tell you what I find best calculated for my purposes (*hear, hear*). After what has fallen from Mr. Johnson this evening upon the

subject of grass lands, I think there can be no doubt but that it is very desirable in carrying manure to do so at a time when the grass will grow quickest over it (*hear*). If you do that, you wont want to put it under ground. If you put the manure on the land the moment you have cut your hay, it is quite astonishing what a difference you will see. I cannot reason on the matter any other way than by supposing that it makes the grass at once begin to grow more quickly and speedily gets covered over (*hear*). I do not agree with our excellent chairman with regard to carting manure out in the winter; I think that when the spring showers are falling, or, in fact, whenever the grass grows most quickly, that is the proper time at which to manure grass lands. The few practical observations, gentlemen, which I have ventured to offer to you are the results of my own knowledge and experience (*hear, hear*).

The CHAIRMAN: It is not my practice to cart the manure upon clover, but it is in the case of other grass-lands, and I have found it answer remarkably well.

Mr. JOHNSON: I think I understood you to say that it not only succeeded with the clovers, but also with the succeeding crop of wheat.

The CHAIRMAN: I did say so, sir (*hear*).

Mr. WOOD: I cannot, sir, say with Mr. Turner, that when I first came into this room this evening I had no intention of speaking upon this question, because I always come here with the intention of taking some part in the discussions of the club (*hear, and a laugh*), although I never take much pains to prepare myself beforehand, but just make such observations as may occur to me at the time. If I were to confine myself to doing so, perhaps there are many occasions on which I should not speak at all, whereas it is my practice to say what I think (*cheers, and a laugh*). It was, however, only my modesty and diffidence which prevented me from rising when there was a pause in the earlier part of the evening (*renewed laughter*). With regard to using manures on arable and grass-lands, in the first place, I beg to say I consider that no grass ought to be allowed to grow on the land; it is all very well for lawns and parks (*hear, and a laugh*)—

Mr. HOBBS: What! wouldn't you have the artificial grasses?

Mr. WOOD: Oh, yes. I don't object to the artificial grasses. With respect to permanent dressing of grass-lands, I expected to have heard more upon the use of liquid manures. Some persons have tried the Dutch plan of manure, but not finding the crop of grass commensurate with the expense, have given it up. I agree with Mr. Johnson's view that the failure very probably arises from improper management of the manure. I do not, however, think we ought to allow any rain-water to be mixed with manure at all. If water be mixed with it, you will increase the expense of removal by increasing the bulk of the manure; and the advantage to be derived therefrom will not, in my opinion, be adequate to the increase of expense. I have tried this in various ways. I have found running it out of the yard of very little benefit to the land, in proportion to the quantity which necessarily must run out; and I think it very

doubtful whether carrying liquid manure is of sufficient benefit to pay the expense of doing so. At the same time, when we know that it answers to apply manure to the roots of grass, I think it ought to be applied in the liquid state. I cannot see how any plough can be made to convey manure to the roots of grass; but I can easily conceive that if a shower comes after manuring, it should be more beneficial than if the manure dries in the sun. So far, my opinion is, that dressing grass-lands is beneficial, if the dressing is laid on; but as to applying liquid manure to agriculture, I don't consider growing grass agriculture, mind (*hear, and a laugh*)—I think it perfectly different—unless in sandy soils, such as are seen in Bedfordshire; and even then I doubt whether you can get the tank emptied at all times, and whether the advantage is equal to the expense. My system is decidedly opposed to making the farm-yard manure depend at all on the quantity of rain-water. I have adopted Mr. Warne's system, not from his recommendation, but from actual experience; and I decidedly think it will have the advantage over all other plans for manuring arable lands (*hear*). My plan is to keep the bullocks six months in their litter without removing it, every day turning over the manure that has dropped, and covering it with straw; and that I can do without raising its level more than two feet in a box ten feet in length (*hear*). There no doubt will always be gentlemen who prefer their own long experience to anything new. I have heard what Mr. Johnson and the chairman have said about dry manure; now, I find in my boxes that the manure is never dry. If I were to begin making it in March, and were to keep it until the following Michaelmas, it would not be in a dry state. The plan which Mr. Warne recommends is to make it under cover, not to carry it after made. I cannot conceive how it is possible to go to expense to obtain that which is the refuse of the whole farm. I find that the manure, as I make it, answers on my clay soil much before any other. My observations go to showing the practical effect of it. A friend of mine, in driving from one part of Sussex to another, passed my farm, and a farm about ten miles beyond it, belonging to Sir Charles Burrell; and he told me that the piece of wheat he saw on my farm, and the piece he saw on Sir Charles's, were the two best pieces he saw in a drive of thirty miles (*hear, hear*). Now, it was a singular fact, but these two pieces were both manured on the system recommended by Mr. Warne (*hear*). It is a singular fact that this should have been the case, but I think it rather goes to show that for that description of soil (a clay soil) manure made in that way is more powerful and better adapted than any other. I observed, in cleaning out, that there was no smell whatever; and manure made in that way remained without heating, while that made in boxes would heat immediately. I beg to say that I am no chemist; and my observations relate simply to matters of fact; and from what experience I have had, I should recommend every gentleman to try the system which I have adopted myself. There is not only the advantage of the manure, but the great ease and comfort in which his cattle thrive

(hear). I know gentlemen may think it impossible an animal could thrive living for so many months in the midst of his own excrement, but there is no offensive smell; in this respect my boxes are altogether different from the stalls which are cleaned out once or twice a-day. Why, in the "bullock palaces" of the Duke of Bedford, at Woburn, I was quite surprised at the smell; the quantity of ammonia—we call it by a different name in Sussex (*laughter*)—the quantity of ammonia that was escaping was extraordinary. In fact, people are great losers by continually poking the manure about (*hear, hear*). I cannot go into any statement as to weight of food, weight of straw, &c., but it has always been my impression that the higher the animals were fed, the more strong and valuable was the manure (*hear, hear*).

The CHAIRMAN.—Can you give us an idea, Mr. Wood, of the relative quantities of manure made in the yard and made in the boxes?

Mr. WOOD.—There is greater quantity in the yard, but greater quality in the boxes (*hear*). I consider three cart loads of yard manure equal to only one of box manure (*hear*).

Mr. HOBBS.—Not more than equal?

Mr. WOOD.—Not more than equal; it is astonishing how slowly it rises in the boxes. My practice is to mix it with mould, and plough it in. There is another point of view in which these boxes may be regarded favourably: there is an astonishing advantage of putting the animals separately, each in a box by himself. In this case, a bullock may be considered his own master, and does not, under any circumstances, come off second best. The advantages of feeding, on this plan, are very great. If, for instance, there is an animal in a yard with several others, which refuses his food, and the others partake of it, the consequence is that they won't take their next meal; but you won't find it out. There is also another great advantage in this system: you can have cattle of different ages, and can put them in at all times of the year. The manure will keep in the state which I have described from its being well trodden down, and you will save all the expense of stirring about; you only have to remove it once, which is a matter of great importance (*hear, hear*).

Mr. EDWARD AITCHESON.—I will offer a few observations, gentlemen, after Mr. Wood, especially as I come from the same neighbourhood. He has said a good deal about expense. Now, I would suggest a plan, with regard to manure, which I have carried out myself. I take all the drains from the different yards to one given spot. Then I collect all sorts of refuse, couch, &c., and with a little mould dam it all up together. That I call the yard for grass lands alone; rubbish of every kind is carried there. Now I think my system may not be amiss to observe; refuse of every kind is manure for grass lands. I think it wrong to carry out anything of this kind upon land intended for the production of corn; because the seeds of weeds may germinate. I therefore suggested the remedy of making one hole for the manure for grass lands, and another for the manure of arable lands; saving the whole of the manure from cattle eating hay, straw, and turnips, as

well as all the straw, for the arable land. By using these manures I have carried very large crops: my practice has not exceeded two years' duration. I would suggest, with respect to the period for manuring grass lands, that there is no time equal to the month of June, when the manure can be well worked into the roots of the grass. I have applied twenty-five loads per acre of the manure out of the refuse hole, and found that it did much more good than if the manure had been carted away upon the land from time to time. The plan I have recommended is also one way of obviating expense when the landlord will not go to the cost of making us tanks (*hear*)*. I have had some experience with regard to liquid manure, and I must confess that I do not think much good is derived from carrying it out, especially in clay soils. I have given the lands a coat of liquid manure in November, and another in the spring; but the following year the crops from the manure carried out about the end of June, or beginning of July, has been double that from the second coat of liquid manure.

Mr. HOBBS: I will, sir, make a few practical observations upon this subject, which I consider one of immense importance to the practical farmer, and at the same time more neglected than any other branch of agriculture (*hear, hear*). I do not quite agree with some of the remarks which have fallen from our friends this evening, with regard to the state of dryness of manure, and also with regard to the subject of tanks. I have

* The remarks of Mr. Dixon, of Hathershaw, in Lincolnshire, appear to strongly confirm the advantages of the plan adopted by Captain Aitchison. In the year 1826, remarks Mr. Dixon, (*Journal Roy. A. S.*, v. 1, p. 135,) "my attention was first directed to raising compost heaps from urine. This I now do frequently, without the help of dung from the cattle-stalls. The same occasion called my mind to another matter, well worthy every farmer's attention. I allude to the great superiority of the manure raised in summer soiling, to that produced in the stalls during winter. I verily believe the difference is fifty per cent., unless stock are fed in a great measure, during winter, with artificial food. In an arrangement for making compost heaps from urine, I would recommend a receptacle to be made at the back of the cattle-stalls, just outside the building; this should hold about twenty cart-loads of mould, or any other matters to be employed; if its situation were a little lower than the cattle-sheds, all the urine would pass into it, and remain there until the mass is completely saturated, which will be sufficient; when the earthy matters are covered over, the compost may then be thrown out, and the proceeding again renewed. In order to show part of the benefits of this practice, I beg here to observe, that the most foul or weedy mould may be used; the action of the urine, if not reduced by water, is so powerful, that wire-worms, the black slug, many other destroying insects, and all vegetables, weeds, &c., when in contact with the urine for a time, are deprived of their living functions. The situation for raising this compost should be protected from the weather by a covering similar to a cart-shed; indeed, the deteriorating influences of rain, sun, and arid winds, on all putrescent manures or compost, are so serious, that, in my humble judgment, it would be worth while to have places under cover where these are usually laid down. The ordinary method of conveying manures on land, admits of much improvement."

had considerable experience in the drainage of manure, and also in catching that drainage in tanks, and applying it to the land—more especially to grass lands. Some years ago I went to considerable expense in erecting pumps and building tanks for the purpose of applying it to the lands. First of all I trenched all my buildings. Still there are parts of the year, after wet weather and rapid falls of snow, when the yards will have a superfluity of liquid in them, which requires to be taken care of, and afterwards applied to the soil. For I do consider that when the drainage of the farm-yard has not been found advantageous, it has arisen from our want of knowing the proper application of it (*hear, hear*). I certainly did at first, particularly in the case of grass land, find it of little or no use; but I find now, by mixing it with earth, that it is most advantageous (*hear*). I think most of us, at present, are entirely in the dark with respect to the application of liquid manures. I believe that if we were to mix sulphuric acid or other chemical substances with it, we should find it far more beneficial than we now do. But we must look to our friend Mr. Cuthbert Johnson to enlighten us upon that point (*hear, hear*). I cannot agree with Mr. Aitcheson that we ought to allow the liquid of the farm yard to run off, and be absorbed in a collection of vegetable matter, and so on. I think, also, that we ought not, in the first place, to allow rain water to be mixed with it, but that we ought to catch it in the strongest state we possibly can (*hear*).

Mr. AITCHESON: I said that when the landlords would not build tanks, that was the next best process.

Mr. HOBBS: I hope the landlords will meet the tenants by building troughs and making tanks. I beg also to say that I do not agree with the observations made by some gentlemen with regard to the propriety of keeping manure in a moist state. I think that Mr. Wood is pretty right as to manure being made in boxes. I think it is much better made in sheds than in the open air. I think most farmers are sufficiently acquainted with the matter to know when to apply liquid manure or water, if they find it come into a too dry state from extraordinary fermentation or other cause (*Hear*). I think any one who has travelled in the country within the last three weeks must agree with me in saying that there has been a ten times greater loss from the manure being washed and soaked, and having all the goodness running away, than there could have been from its being kept dry (*Hear, hear*). I quite agree that fermentation will be the result of its being kept too dry; but if it is well trodden down by the cattle in the boxes it will never get into a dry state (*Hear*). I don't quite agree with Mr. Warne's plan of feeding in boxes; a person who bred a large quantity of stock would have to lay out an immense sum of money to build these boxes; but it is a better way of keeping cattle than the manner in which they are generally kept (*Hear*). One thing appears to have been forgotten in this discussion, and that is the greatest possible economy in making manure. I think with the old saying, that it is a bad piece of roasting beef that won't find gravy to baste it; and depend upon it, it is a bad farm that won't supply sufficient manure with which to keep it in condition (*Hear, hear*). A great

loss is sustained by feeding animals on straw and a few turnips; where that is the case we need not be surprised that there is a deficiency of farm-yard manure. Our chairman has alluded to a top-dressing for grass; I quite agree with him that the autumn, and early in the autumn, is the most proper time for dressing clovers and grass; and the difference which exists between Mr. Baker and Mr. Turner I attribute to this fact, that the one lives in the east and the other in the west; the latter does not suffer from the frost (*Hear*). I cannot agree with the opinion that two coats of manure ought to be applied to pastures. I have been in the habit of manuring pastures in the early part of the autumn with unfermented manure, and always found from eight to ten tons so applied much better than a larger quantity of rotten or fermented dung at any other time (*Hear, hear*). I think grass grows much more rapidly when the dung is applied in an unfermented state, or when in the early process of fermentation, than when it is in a decomposed state. My plan certainly is that of applying it in a state of fermentation, by first of all carting it out from the farm yard and laying it in clamps from four to five yards wide, and four feet deep, treading it well down, and, about ten days before applying it, having it turned over. That is my mode of proceeding for root crops at this season of the year. I generally prefer, if the manure is in an unfermented state in November and December, to plough it in, and at this period of the year apply artificial manure. I have found this to have a most beneficial effect, and it is my intention to pursue the plan as much as possible. I have no doubt that manure will be more generally applied in an unfermented state, when the farmer begins to see that it is not his interest to grow weeds; in fact, as farming generally improves, so also will the modes of manuring (*Hear, hear*).

Mr. AITCHESON: Will you allow me to ask you, Mr. Hobbs, this question—Are you in the habit of sowing artificial grasses, rye, and clover, on land which you don't think capable of bearing you a good crop next summer?

Mr. HOBBS: That is not my general habit. The only difference is, you apply your manure for wheat; our system is barley after fallow, then clover, then wheat (*Hear*).

The CHAIRMAN: In Essex, we consider we cannot mend the lands too highly.

Mr. HOBBS: What does it cost you to build the houses to which you were alluding?

Mr. WOOD: I can build them for about £6 each. I construct them with bricks, timber, and felt; they have felt roofs. With regard to what has been said about feeding cattle on straw, I beg to say that there are a great many cattle sent to Smithfield which are fed on straw, with the assistance of a few turnips or pudding made of linseed and corn (*Hear, and a laugh*).

Mr. JOHNSON: The observations made by Mr. Wood about feeding cattle on straw reminds me of a story of the late Lord Leicester. He had a very capital bullock yard, and endeavoured to persuade the farmers how much better it was to introduce "Devons" than

any other breed. He had invited some cool-headed jolly farmers to inspect some of his bullocks, which he said he had found, upon calculation, consumed exactly 23½ turnips a day each. The farmers thought it was a very nice calculation, and one of them in looking about found a quantity of peas-meal. He immediately exclaimed, "How is this? Why here is peas-meal!" "Why," replied one of the attendants, "we find that giving them a little peas-meal assists the operation of the turnips amazingly" (*Hear, hear, and laughter*). This discovery, of course, rather spoilt the story. With regard, however, gentlemen, to the subject of this evening's discussion—a discussion which, after hearing the opinions of the able and practical men around me, has given me great satisfaction—I think we pretty much agree in our general views. For, although some gentlemen appear to have given rather discordant opinions upon some points, yet, if the question be looked upon calmly, and with the assistance of scientific evidence, these discordant statements will be easily reconcilable. First, with regard to the preparation of liquid manure; some gentlemen have stated the advantages of the use of liquid manure, and others have denounced it as not productive of any good results (*Hear*). Now the very essence of a discussion of this nature is the inquiry "What is meant by liquid manures?" Having assisted at a great many experiments in agriculture, and suggested many such experiments, I feel that the first part of the story is, to know what the farmer regards as liquid manure. It is more generally found that among farmers a little coloured water is often dignified by the name of "liquid manure;" as some people put water, in which eggs or cabbage are boiled, into the pig trough with the idea that it will help to make the food richer (*laughter*). Now in those countries where liquid manure is applied to the land by practical, acute, and calculating farmers, that which they call by this name is prepared with very great care (*Hear*). It is not similar to that thin watery stuff which drains away from the farm yard after a fall of rain; but this is mixed carefully with the animal excrements, and, above all, it is never applied to the land until it has undergone the process of putrefaction, and has come to the consistence of cream, and by this process a large quantity of fixed air and ammonia has been generated. I am not going to inflict this story upon you a second time, but as one or two gentlemen have entered the room since I read the results of M. Sprengel's experiments, allow me to repeat that portion of my opening statement which related to the experiments on the urine of animals in three different states:—First, when freshly voided; secondly, after it had undergone putrefaction, but without mixing; and thirdly, after putrefaction, but mixed with a considerable bulk of rain water. (Mr. Johnson here repeated the results of the analysis, which will be found in his opening speech, and proceeded): I read this because it appears to me to bear upon the application of manure, either in the wet or dry state. The result you will see was that 100,000 parts of fresh urine contained 205 parts of ammonia; after putrefaction the 100,000 parts of urine contained 487 parts of ammonia, or more than double; but after putrefaction, and mixing with its own bulk of

rain water, 1622 parts of ammonia—the ammonia, in fact, of the second experiment being nearly quadrupled by the third experiment (*Hear, hear*). Now surely we cannot help feeling that the result of this analysis illustrates and renders clear the reason why it is that the farmers of Belgium so extensively, so universally, use tanks; why they so carefully mix their manure with water, and allow it to undergo the process of putrefaction; and they all agree in this, that it is of no use until it is putrefied (*Hear*). I think the analysis of M. Sprengel quite clears up this point.

Mr. TURNER: In Belgium they have very little litter; consequently nearly all their manure runs liquid, and is much more valuable than it is in England.

Mr. JOHNSON: The Belgian farmers do a great many things which the English farmer would do well to imitate them in. I take it that the analysis of the chemist throws considerable light on the subject; it shows us why we have so many discordant statements respecting this liquid manure; one party finding excellent results from its use, and the other condemning it as producing no beneficial effects at all. There are two great causes for this: one is, that the manure is too poor; and the other, that it is not allowed to undergo the process of putrefaction before it is applied. In some experiments made in the neighbourhood of London with a view to the use of the town sewage, it was thought very desirable to ascertain the strength of that sewage, and discover whether it was water discoloured with various organic matter, or whether it contained a very large proportion of foreign substances. Now, in those experiments we found what we were not at all prepared to expect, namely, that the sewage of London is often from two to three times the strength of sea water. A gallon of sea water usually contains about four ounces of various salts; but it is very often found that the water from the common sewers of London contains from twelve to fourteen ounces per gallon (*Hear*). The salts from urine, the matters from night soil and soap suds, and all the various substances which can be supposed to mix in the waters of the common sewer, contribute to this large percentage. Now, in point of richness, the drainage from the farm-yard never approaches this (*Hear, hear*). Those that I have examined never contained more than one ounce per gallon, and frequently not more than half an ounce of organic matter. If the farmer use liquid manure at all, he must either employ it for the purpose of irrigating the land, or apply it at the rate of about one ton per acre, in much greater strength than at present, and not until after it has undergone the process of putrefaction. This, if well considered, explains many of the discordant statements we have heard upon this point, and throws some light upon the question as to the mode in which manure should be prepared. I find that one or two gentlemen who have addressed this meeting, and especially Mr. Wood, rather advocated the box system of preparing manure (*Hear, hear*). I confess that, reasoning upon the matter on scientific grounds, and approaching the question with that caution with which I endeavour to

approach all questions of a practical nature, for I consider the great value of science to agriculture to be in the endeavour to explain the processes of the farmer as a guide for future operations, and that if men of science have not their eyes to the practice and pocket of the farmer, their efforts will be of little value (*Hear, hear*). Approaching, then, the consideration of the subject in this cautious spirit, I think the preparation of manure in the dry state is pretty well illustrated by these experiments (*Hear*). Because, if the product of the decomposition of manures in their wet state is a larger crop of ammonia than when prepared in a dry state, then I am at a loss to know how in a dry state it can be most advantageous? (*Hear, hear*.) I am perfectly aware that, when, by neglect of troughs and drainage, the farm-yard is allowed to be inundated by a quantity of water, to such an extent that a considerable part of the manure prepared in the yard is washed away—I can easily see that that is not the right way. But still I am rather inclined to the opinion that the manure of the farm-yard, prepared with a moderate degree of moisture, and where drainage and soakage are carefully prevented, by means well known to the farmer—under these circumstances, I think manure prepared in the moist way more enriching than that produced in covered buildings (*Hear, hear*). There is one fact which has been elicited this evening by these practical observations, which I consider very interesting, and will no doubt lead to future examination, and that is the advantage of applying manure to grass lands in the autumn (*Hear*). I have been struck with the unvaried testimony which has been produced to the fact that it is more beneficial to apply manure to grass lands just after the hay has been cut, and perhaps even under the burning sun of July, than at any other time (*Hear*). Now, I confess that, as at present advised, I do not see my way clearly into the reason of this; but that is no argument against its being the fact (*Hear, hear*). I remember (to give an illustration of my meaning) that when gypsum was first introduced, it was stated by persons who had examined the matter scientifically, and among them the great Sir Humphrey Davy, that it must be a manure for particular crops. Well, it was tried by the late Lord Leicester, and other still more able farmers, but it was found that it did not answer. Sir Humphrey was puzzled, but was obliged to be satisfied with the fact that it did not. At last, a Kentish farmer discovered that it would do if applied in a particular way: that it must be strewed from a basket upon the land, in a dry powder, and that it answered best early in the spring on a wet morning (*hear, hear*). This came to the ears of Sir Humphrey Davy, and he was asked to explain it, but he could not; neither can any chemist now explain it. But so it is; if applied as I have stated, it is of great benefit to sainfoin and clover, but otherwise it is of no use at all (*hear*).

The CHAIRMAN: I think it is accounted for in this way: the gypsum has an affinity for the ammonia discharged from the clouds, and that I believe is the way in which it operates (*hear*).

Mr. JOHNSON: I should agree with you in that so-

lution of the matter, were it not that I know the quantity of ammonia in rain water is so minute that the chemist can only just detect it. You may find some ammonia in the atmosphere of a large town like London, but if you go on the downs of Sussex, where the air is pure, and where everything is good and honest—(*hear, and a laugh*)—you will find very little. The question which we have discussed this evening, with regard to the preparation of liquid manure and of solid manure, in boxes or otherwise, will no doubt be canvassed in other rooms and other clubs besides that to which we have the honour to belong; and I cannot but express my satisfaction at the very clear way in which it has been conducted. So long as the discussions of this club are thus conducted, they will tend to add to the information of the farmers of England, and at the same time render the landlords of those farmers better acquainted with the wants and the necessities of their tenants, and the most politic treatment which they ought to receive at their hands (*loud cheers*).

Mr. AITCHESON: What is your opinion of the application of common salt to farm-yard manure? Is it beneficial or not?

Mr. JOHNSON: I should think the application of common salt very good, where you considered that you had a quantity of insects, or the germs of insects, or the seeds of weeds which it was desirable to kill. But further than that, if common salt be applied at all, I think it is better applied directly to the land alone, or with a certain quantity of lime.

Mr. AITCHESON: Then the application of salt would not assist the ammoniacal qualities?

Mr. JOHNSON: I think not.

Mr. HOBBS: What ingredient should you recommend to fix the ammonia in liquid manures?

Mr. JOHNSON: I fear, Sir, it is very difficult to recommend anything of a practical nature that would fix the ammonia. I have conducted experiments in a great variety of instances with a view to this inquiry. But between the experiments of the chemist in his laboratory, and those which come within the practice of the farmer with his hundreds of acres, from which ammonia is evolved in large quantities in every direction, there is a wide difference. It is impossible for him to fix the ammonia by the use of sulphuric acid as the chemist would do; sulphate of ammonia is an admirable manure, and it is all very well to say sulphuric acid would do it. But then I know that a farmer cannot go over his farm sprinkling the land with sulphuric acid (*hear, and a laugh*). A sprinkling of lime or gypsum is, however, a very good thing, and gypsum is exceedingly cheap. If powdered gypsum be spread under the litter of a stable, the strong smell disappears; that is a proof that the sulphate of lime has combined with the ammonia; sulphate of ammonia is devoid of all smell, it is not volatile like the carbonate of ammonia.

The CHAIRMAN: It is our practice, gentlemen, to come to some resolution upon the discussion of the evening. It is difficult, perhaps, to do this in reference to so extensive a discussion as that of this evening. We must endeavour, however, to embody generally the ob-

servations of the speakers upon the various points to which our attention has been directed (*hear*). Mr. Johnson made some observations as to a difference of opinion upon the application of manure to grass lands, and I think (inadvertently no doubt) misrepresented my views. I said the proper time for the most beneficial application of manure to grass lands was immediately upon the removal of the hay crops (*hear*).

Mr. JOHNSON: I did not, I think, state that there was any difference of opinion upon that point, at least I did not mean to do so. My observations went to the difference of opinion which existed as to the preparation of manure, whether it was better wet or dry (*hear, hear*).

The CHAIRMAN: As to the manufacture of manure, I think it has been shown that it is best not to be made in the dry state; that it loses very many of its good qualities when it enters into a dry state of fermentation. We find practically that it is so; so that we are decided upon that point. Then there is the question whether it is better made under cover or in the farm-yard. We have come to the conclusion that just as much moisture is necessary as will prevent its entering into a state of fermentation. With regard to making it in stalls, I think you have the concentration of manure by so doing; you have less in quantity, but it is highly concentrated (*Hear*). Every farmer, in the application of manure, measures it not by quantity, but by quality (*Hear, hear*). After a few other observations, the Chairman concluded by saying: The great question before us is

the manufacture of manure; and keeping to this point, I have drawn up two or three resolutions, as follow:—

1. That in the manufacture of manure there should be sufficient moisture, and no more than is required to prevent its entering into too active a state of fermentation; and that the greater the extent to which it is incorporated and compressed the better.

2. That the economy of manure depends upon its immediate application to the soil from the farm-yard so far as is practicable, and ploughing it quickly into the land.

3. That it appears, from the observations which have been made, that the proper time of application to grass lands is immediately after the hay crop has been removed.

4. That the rendering it portable by the process of composting materially diminishes it both in quantity and quality; and that this process should not be carried further than is absolutely necessary to facilitate its application.

5. That such liquid manure as is usually discharged from farm-yards is better when applied to dunghills or collections of earth and vegetable matter than by an immediate application to the soil (*cheers*).

After a short conversation as to the precise words of the resolutions, they were agreed to as above.

Votes of thanks were then passed to Mr. Johnson, for his admirable lecture, and to Mr. Baker, for his conduct in the chair; and both gentlemen having briefly returned thanks, the meeting separated.

ON THE INFLUENCE OF NEW BUILDINGS ON THE HEALTH OF HORSES.

BY M. VILATTE, SURGEON, PARIS.

The stables of M. Eugene Cremieux, dealer in horses, are spacious, and well exposed to the air; nevertheless, the horses frequently fall ill in great numbers. Half of them are occasionally most seriously affected; and, in fact, death is regarded imminent from the moment that disease begins to appear. The same forage is given to them the year round—the oats are of the best quality—all the water is drawn from the Seine—and the care and management of them are as minute as can by possibility be conceived.

Well assured that the discovery of the causes of one malady, which rages over a great number of animals in the same stable, is of the highest importance, I neglected nothing to arrive at it; thinking that it was infinitely preferable to prevent the disease than to overcome it by force. I will enter into this subject at some considerable length.

The stables of M. Eugene Cremieux are generally known to have none but English horses of the greatest value, all of them of a sanguineous temperament, nervous, and naturally predisposed to inflammatory affections. I had nothing to do but to

combat the apoplexies, congestions, or acute affections, of the most intense character, which surrounded them.

On the 5th of November a grey horse was mounted at 7 o'clock in the morning for the promenades and *pas*. The rider perceived that the animal went feebly. Having arrived at the avenue Neuilly, the animal broke out into a general cold sweat, and an infectious diarrhoea followed, so abundant, that the rider told me that he evacuated as frequently as if he had taken the most active medicine.

The horse was brought home with much evident pain, and the moment that he arrived he lay down, rolled himself about, regarded his flank, continually rose and laid himself down again, fought with his hind limbs, agitated his tail, and could not rest himself a single moment.

On my arrival I found him lying on his right side, frequently looking round at his flanks; the tail was contracted towards the left side. I made him raise himself, but he fought violently, and was continually up and down. He made numerous ef-

forts to stale—his eyes were fixed—the pupils dilated—the conjunctiva and the mucous membrane of the mouth were of a pale yellow—the mouth was dry and cold—the pulse small, feeble, and soft, and presented a peculiar kind of intermission; but after two or three pulsations the respiration was short, or only half an inspiration seemed to be executed.

The contractions of the heart were strongly felt, and even tumultuously so—the skin was cold—the abdomen painful—the flank hard and corded. There were some horborigmi, but they were feeble. The emollient lavements which were administered, and which were returned almost immediately, had an infectious odour.

What was to be done when the animal seemed to be almost dying.

The diagnosis was plain. It was a sanguineous congestion and an intestinal apoplexy.

Exciting frictions, hot and dry vesture were spread over the whole of the body. After an hour's friction the warmth of the skin became elevated a little. The pulse feels much better—the contractions of the heart are less tumultuous—the respiration is freer—there is a slight evacuation of urine of a deep yellow colour and an oily appearance. The horse, however, left at liberty, torments itself still more. The colic continues.

I thought this an opportune period for practising phlebotomy. The blood ran in a considerable stream, but it was very black. Placed in an ordinary glass the blood was black and thick, especially when in the temperature of the stable.

Some hours after the bleeding, an improvement was manifested. The colic had ceased, and everything seemed to pronounce a considerable improvement, and to give promise of its continuance: I thought we had triumphed over the evil that we were far from abating in the morning.

At ten o'clock at night there was an evident improvement, and in the morning I thought that the animal was out of danger; but it was not to be so, for the implacable and incessant disease continued to exercise its ravages, and I found the horse in a desperate state at six o'clock in the morning.

The animal had extreme feebleness—the pulse was small, and scarcely to be felt—the conjunctive and the buccal membranes were pale—the mouth was dry and cold—the skin also cold—the respiration short and painless—the contractions feeble and tumultuous—the dorso-lumber region insensible—and the walk staggering. I could not explain changes such as these after having left the patient so well ten hours before. I saw that the close of the affair was at hand, yet I wished once more to endeavour to be of service.

The examination took place eight hours after the death of the animal. I have already remarked that

the organs of the chest were perfectly sound. The lungs resembled those of animals destroyed by effusion of blood. The heart was pale, and did not contain in the right ventricle more than a small quantity of black blood, without any that was white.

On opening the abdomen, I observed a slight appearance of sanguineous blood. The liver was of a pale yellow—the stomach did not present anything peculiar—the mesentary was strongly injected, especially the portions of the meso-colique, and meso-rectal. The small intestines offered nothing remarkable; but the colon cæcum were strongly coloured, and the mucous membrane through its whole extent was separated by a sero-sanguinolent body. It was of a black character, and easily torn.

The large intestines contained a red liquid fluid of an infectious odour.

Some time afterwards, I was called early in the morning to a horse who was said to have a frequent and feeble cough, and to refuse all aliment. I found that the conjunctiva, pituitary, and buccal membranes were of a deep red—the mouth warm and dry—the respiration difficult, short, and dry—the horse appeared at certain times as if menaced by suffocation—the expired air was hot—the pulse was full and quick—the urine in small quantity, of a yellow colour, a strong odour and an oily appearance. The diagnosis was not doubtful. There was congestion, with threatenings of apoplexy. I announced that in probably less than twenty-four hours the business would be completed.

Two bleedings were practised in less than eight hours. Exciting frictions were had recourse to—acidulated drinks were given with opiates, and laxative and diuretic medicines continued to be had recourse to in the night, unremittingly for ten hours.

On the following morning, at seven o'clock, the symptoms were more exasperated; the blood was again black, thick, and formed into abundant coagulum. Vesicatory ointments were administered. As the day passed on, the respiration was more free; but this lasted not long, and was only kept up by the influence of some unknown cause.

At seven o'clock in the morning the state of the animal announced the near approach of death. The respiration was plaintive and laborious—the spumous râle was well characterized. The pulse was scarcely to be heard—the contractions of the heart were tumultuous.

At nine o'clock the animal could no longer sustain himself, and he fell. In this position, respiration became impossible: he made some vain efforts to relieve himself—he altered his position in a slight degree—he half lifted himself, and fell again immediately. He neighed three or four times—he made various efforts—his eyes rolled in their orbits.

By one strong respiratory effort he looked around him—his limbs became contracted—one respiratory sound was heard—and he died. All that remained was some bloody discharge from the nostrils.

The autopsy was eight hours after death. I remarked a great quantity of black blood in the chest; the lungs were voluminous, filled with blood, and unusually large in quantity. Towards the posterior and diaphragmatic portion of the right lobe or pleura a clot of very thick blood was observed. The

pleuræ were of a deep hue—the ventricles soft and discoloured—the right ventricle contained black blood without any yellow clot. The interior of the ventricles and some large arterial trunks have a violet tint and smell. The bronchi, the trachea, and the larynx, not only contain a red and spumy blood, but they have also a deep red.

The abdomen does not offer anything remarkable.

In the last month many other horses have been affected with pulmonary complaints.—Veterinarian.

THE MAIDSTONE FARMERS' CLUB.

At the last meeting of the club, the subject for discussion was the use and best method of applying lime. Mr. C. G. Whittaker, the chairman, having been obliged to leave early,

Mr. W. BARNES, the vice-chairman, presided, and, in introducing the subject of discussion, said that some years since, he had been in the habit of purchasing a considerable quantity of lime. At length, however, he thought of testing it, to see whether its effect was sufficient to warrant the expense of it. On the land which he farmed, the Weald clay, he had tested it in every way, having tried fields half limed, and the other half left without lime; and also he had left slips unlimed in limed fields. He had tried this for three or four years, and for his own part he could never discover any good that lime had done. Since he had satisfied himself of this, he had never purchased a single carriage of lime, and he would not now put lime on his land, if he could have it at a gift. He had, however, seen it do considerable good where the land was first broken up from lying in sheep walk. He knew one case at Appledore, where a very rough piece had been broken up for beans; and, in putting on a given portion of lime, the labourer had laid it on too thickly in one part, and had been obliged to leave a small portion wholly unlimed. He (Mr. B.) afterwards saw the crop, and remarked on the great difference between the limed and the unlimed portions. Where it had been limed, there was a very good crop; but where it had been left unlimed, there were scarcely any beans at all. On inquiry, he had discovered the cause. This was the most favourable instance which he had ever met with, of the application of lime. Such being the case, it might be asked why so much lime continued to be applied to the sort of land on which he had satisfied himself that it was useless? The answer was, that farmers had done it because their forefathers had done it before them. Lime had been continually put on many soils, till all the ve-

getable matter they contained had been exhausted; after which it had done the farmer no more good than if he had thrown his hat on it. He wished to be understood that he spoke of such soil as he himself cultivated. Now that he was addressing the meeting, he might perhaps be permitted to state the result of some other experiments which he had made some time since, in which he had applied different manures to a piece of Swedes, which had been followed by oats. He would now mention the results. He had put upon each acre an equal cost of manure, excepting the horse dung.

Bushels.	Swedes.
90 loads of horse dung .	300 bushels.
8 cwt. Peruvian guano .	640 “
1 ton of rape dust. .	460 “
1 ton of urate. . .	380 “
40 bushels of bones .	480 “

The whole piece of land was put in with oats in the following spring, and the acre which had been dressed with guano was the best piece, by from four to six bushels per acre. The oats had been followed last year with clover, in which crop the portions dressed with rape and guano were the best. This showed that those manures had not been exhausted till the third crop. In this case, the dung which had produced the least, had lost half as much again as the other manures.

Mr. G. POWELL said that he had used lime for some years, without receiving any benefit from it. He had, however, known a gentleman at Boughton, who farmed very highly, and whose land was a sandy soil on the ragstone, who had tried guano, sulphate of ammonia, bones, and other artificial manures, but had never been able to get Swedes so good as with lime. He had an excellent piece of turnips this year, on land, part of which had been dressed with bone-dust six years back, and on which he had tried lime, by way of experiment. Where the bone-dust had been placed, he had got

good turnips; but, where there had been no bonedust applied, no turnips had been grown. On another part of his farm, the gentleman had used nothing but lime for turnips for the last twelve or thirteen years.

Mr. VINEY said that he had paid as much as £50 per year for lime, some years since, at which time it was the constant rule of all the farmers in his parish (Headcorn) to use lime; but now, he believed, there was scarcely a farmer in the parish who continued to do so. The last lime he had applied had been given to him, on the condition that if it did any good, he was to have it for nothing; and that if it did harm, he was to be paid by the limeburner for the damage (*a laugh*). It certainly did no good the first year, and the lime-burner said, "Well, let us see what good it will do next year." He (Mr. V.) said, "Well, perhaps I may get something for damage," when he said, "I think we may as well let it go." This was rough lime, and had done no good either on trefoil or clover. He (Mr. V.) had, however, sometimes seen lime do good upon old meadows.

The CHAIRMAN asked if any gentleman could explain why old rubbish, and mortar from old buildings, scarcely ever failed to do good in land where fresh lime might be useless?

Mr. WHITING said that it had almost always been found that the mortar of old buildings, probably on account of the animal excretions which they had absorbed, were always found to contain a large portion of nitrogenous salts. Indeed, at one period, the French obtained a portion of their nitre from this source, for the manufacture of gunpowder.

Mr. HATCH said that having had some lime brought to him, carriage free, at 12s. per load, he had applied it as a top dressing for hops; but he could not see that it had in this case been of any benefit. He had, however, seen it beneficially applied to an old meadow.

Mr. HAYES said that Mr. Wickham, of Goudhurst, who had always used lime, had said that he had never seen any benefit from lime in the field, but that he had always found the benefit of it in the barn: he had never been able to detect the benefit of it by the eye, but had always felt it in his pocket.

Mr. BARNES said that he had been asked to try lime on his farm in Essex, and had authorised the limeburner to put on whatever quantity he liked to some grass land, and to treat the land in his own way. It had done no good there, when the lime-seller said that perhaps it might do some good if it were to be tried on the ploughed land, but it was equally unsuccessful there. He (Mr. B.) had not tried its effect in the barn, but had been quite satisfied

with what he had seen. He had tried it against dung, and in the first crop the limed part had been considerably inferior to the other. In the oat crop which followed, the limed part had not produced so much by two-thirds as the dunged part. In the following year the same piece of land was in seeds, and the limed part certainly did not produce half so much as the other.

Mr. VINEY said that he knew a gentleman (now in America), who had spent £1000 in lime, and whose lime had one year actually cost him more than the value of the wheat which he had grown with it—he having grown one quarter of wheat per acre, and used three loads of lime.

Mr. HAYES said that he had known an instance in which lime had succeeded—whether or not in consequence of any difference in the soils, he could not say. He had had two pieces of wheat; one, which had been limed, had been set at harvest-time at $3\frac{1}{2}$ quarters; whilst the other piece, which had not been limed, had been set at four quarters. When, however, he came to thrash them out at harvest time, they both yielded four quarters.

Mr. BEARD said, that he had used lime with hops, and thought that the lime induced them to fruit better.

Mr. W. P. SHIRLEY said that he had experienced the same effect from the use of lime on hops.

Mr. BEARD asked if any gentleman had found that the use of lime had brought the mould on hops.

Mr. ELVY said that he had proved it. He had put twenty loads of lime on a piece of hops of four acres, four years ago. The year before the hops had been limed, they had been free from mould; but in the year following they became mouldy.

Mr. HATCH said that he had heard it said that horse dung was a bad thing for the mould. He had known a gentleman, however, who, having had a very mouldy crop of hops, which had been scarcely worth picking, had given them a heavy dressing of horse-dung. His neighbours told him that he was adding fuel to fire; but he persevered, and in the next year he had as fine a crop of hops as anybody in the parish.

Mr. SHIRLEY related several instances in which he had grown productive crops of hops without mould, after lime.

Mr. BOUCHER said that he had a neighbour, who always limed his hops, because he would not have the mould.

Mr. WHITING, in calling the attention of the meeting to the chemical effect of lime, reminded the members that although it mostly happened that the soil had sufficient lime for the purposes of the crop, yet that it might happen to be deficient in this inorganic ingredient of plants. One use of lime was

to decompose the organic matter which existed in the soil, so as to render it soluble, and available as the food of plants. Lime also acted mechanically by lightening stiff soils; and it must never be forgotten that lime formed an important ingredient in the composition of the most valuable crops. Clover, lucerne, and sainfoin had been classed by Liebig as essentially lime plants. In the state of phosphate of lime, that substance entered largely into the composition of Swedes and wheat; and Mr. Nesbitt, in his analysis of the hop, had shown that every hundred pounds of hop, leaf, and bine, contained no less than — lbs. of lime.

Some further conversation ensued respecting chalk: in which

Mr. GEORGE POWELL stated that a dressing of chalk invariably killed that troublesome weed, the mountain flax.

The following resolution was unanimously adopted:—

“Resolved, that on many clay soils, which have been long cultivated, and frequently dressed with lime, this dressing is believed to be of little value; but on fresh broken land, and also on hop lands, where a large quantity of undecomposed vegetable matter remained in the soil, or where land has not been limed for some years, it has been found highly beneficial.”

The subject for discussion at the next meeting will be—the cultivation of root crops.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A Weekly Council was held at the Society's House, in Hanover-square, on Wednesday, the 29th of April—present, the Right Hon. Lord Portman, President, in the chair. Earle of Erne; Hon. Captain Howard, M.P.; Sir John V. B. Johnstone, Bart., M.P.; Sir John Ogilvy, Bart.; Colonel Austen, M.P.; D. Barclay, Esq., M.P.; T. Raymond Barker, Esq.; F. C. Cherry, Esq.; E. D. Davenport, Esq.; A. E. Fuller, Esq., M.P.; C. Hillyard, Esq.; John Kinder, Esq.; Rev. C. E. Keene; Colonel Mac Douall; Professor Sewell; S. Solly, Esq.; W. R. C. Stansfield, Esq., M.P.; George Wilbraham, Esq.; Henry Wilson, Esq.; Colonel Hulse; J. A. Knipe, Esq.; A. Ogilvie, Esq.; E. Parkyns, Esq.; H. Price, Esq.; Major Pugh; J. P. Severn, Esq.; Rev. J. R. Smythies; W. Staffurth, Esq.; C. T. Tower, Esq.; T. Turner, Esq.; and T. R. Tweed, Esq.

Railway Liberty.—The Secretary laid before the Council letters received from Mr. Saunders, Secretary to the Great Western Railway Company, and Captain Mark Huish, General Manager of the Grand Junction Railway, conveying in the most handsome and liberal terms the pleasure it gave to the Chairman and Board of Directors of their respective companies, to promote the disinterested and national objects of the Royal Agricultural Society of England, by granting a free transit along their lines of railway to the stock and implements entered for exhibition at its Country Meetings. The President and Council having expressed the gratification they felt on being made acquainted with these instances of public liberality in favour of the Society and its objects, a vote of their best thanks to the Chairman and Directors of each of those Companies was moved respectively by Mr. Wilbraham and Mr. Raymond Barker, and carried unanimously, for the favour of their communications, and the high sense the President and Council entertain of their most liberal concessions.

Newcastle Meeting.—Mr. Manning, Contractor of Works to the Society, reported the satisfactory progress

of the various arrangements for the ensuing Country Meeting, to be held in the middle of July next, at Newcastle-upon-Tyne, connected with the erection of the Pavilion, the enclosure of the show-yard, and the supply of 1,600 iron hurdles for the construction of pens for the stock.

The Secretary reported to the Council that numerous applications had been already made by intended exhibitors at Newcastle, for leave to enter implements and stock for the forthcoming show.

Mr. Glover, Secretary to the Local Committee at Newcastle, announced the intention of its members to offer special prizes for poultry on the occasion.

Adulteration of Manures.—Mr. Tower and Mr. Davenport having called the attention of the Council to the great extent to which artificial manures in this country are adulterated, and consequently the serious loss and disappointment experienced by the practical farmer in adopting recommendations connected with their trial,—Sir John Ogilvy remarked that in Scotland, the establishment of the Chemical Association, of which he was a member, had exercised a most salutary influence in checking the progress of these dishonest practices, from the dread of exposure it impressed upon the guilty parties.—Mr. Kinder then gave notice that, at the next Monthly Council, he should move the appointment of an “Inspector of Manures” to the Society; and as his intelligent neighbour, Mr. Lawes, of Rothamsted, who had that day been elected a member of the Society, had long been engaged in the chemical investigation of manures, and of their practical effects under given circumstances on his own experimental farm, and had expressed to him his willingness to undertake, on his election into the Society, such honorary office, and examine in that capacity, free of all charge to the members who might apply to him, all samples of suspected manures from time to time submitted for his inspection, reporting to them in due course the results of his investigation in each particular case; being amply

rewarded for such services by the honour of the appointment, and the opportunities it would give him of being useful—he should propose the election of that gentleman to the office in question.

Flax Cultivation.—Mr. Warnes having attended the meeting for the purpose of presenting to the Council a copy of his work, recently published, on the "Cultivation of Flax," and received their best thanks for such mark of attention, communications on the same subject were read from Mr. Dickson and Mr. Beale Browne, when an interesting discussion ensued on the information detailed by the President, the Earl of Erne, and Mr. Stansfield, M.P., in reference to practical results, in the trial of flax, obtained under different circumstances of its cultivation and management; and the Council accepted the offer of Lord Erne to furnish the Society with a statement of the various plans which had been adopted for the growth of flax in Ireland, and the success or failure which had in particular cases attended their trial; on the receipt of which, the Council ordered that the whole of these papers should be referred to the Journal Committee, with a view to their consideration of the propriety of offering a handsome prize for the best essay on the subject.

German Agriculture.—Dr. Zeller, Privy Councillor to the Grand Duke of Hesse-Darmstadt, and Perpetual Secretary to the three Agricultural Societies of that Duchy, transmitted to the Council a valuable collection of works, of which he was the author, on the following subjects:—

1. On Agricultural Book-keeping. 2. On the Public Laws for the Improvement of Meadows in the Grand-Duchy of Hesse. 3. Account of the Proceedings of the Agricultural Societies of the Duchy from 1842 to 1845. 4. A account of the Proceedings of the Great General Meeting, held at Mayence in 1840, of the Vine and Fruit-tree Growers in Germany. 5. On the most Useful Agricultural Implements of the South of Germany. 6. Fifteen Sheets of Designs for Agricultural Buildings. 7. On the Science of Agricultural Proportions (Elementary Data and Statistical Facts alphabetically arranged): Part I. Cultivation of Plants.

The Council ordered that these Works be severally bound and placed in the Library of the Society, and that a copy of the Journal be sent to Dr. Zeller, along with the best thanks of the Council, in acknowledgment of the present he had so kindly taken the trouble to transmit to the Society.

Miscellaneous Communications.

1. Letter from Mr. Bray, Town-Clerk of Birmingham, on the subject of the Annual Country Meeting of the Society for 1847.

2. Letter from Mr. John Clarke, of Long Sutton, placing his Essay on the Breaking up of Grass-Lands, "commended" by the Judges, at the disposal of the Journal Committee.

3. Letter from Mr. Hincks, suggesting the publication of the Names and Pedigrees of Cattle exhibited at the Country Meetings of the Society, in the Catalogues of the Show.

4. An account, from Dr. Vacy, of the Details of Mr. Gurney's Experiments on the subject of "Gurneyism."

5. Paper from Mr. Townley on raising new varieties of Potatoes from Seed.

6. Welch Potato-eye Scoop, from the Rev. J. Williams.

7. Specimen of a Weed from Mr. Fuller, M.P., over-running his Wheat plant, and which he had been unable to eradicate from his land.

8. Statements and Plans, from Mr. Harrison, of Dezeives, in reference to the constructions of Cottages, &c.

9. Proceedings, from Mr. Pearsall, of the Hull Philosophical Society.

10. Model of a one-horse Cart, from Mr. Graham, of Bersted Lodge, Sussex.

11. Specimens of "hollow iron," from Mr. Stratton, of Bristol.

The Council then ordered their best thanks for these several communications, and adjourned to Wednesday, the 6th of May.

A Monthly Council was held at the Society's House in Hanover-square, on Wednesday, the 6th of May; present: the Right Hon. Lord PORTMAN, president, in the chair; Duke of Richmond, Marquis of Downshire, Earl of Aylesford, Earl Spencer, Earl of Erne, Earl of Ducie, Earl of Lovelace, Viscount Hill, Viscount Newry and Morne, Lord Braybrooke, Hon. R. H. Clive, M.P.; Sir Hungerford Hoskyns, Bart.; Sir Matthew White Ridley, Bart.; Sir John V. B. Johnstone, Bart., M.P.; Sir Charles Douglas, M.P.; Colonel Austen, M.P.; D. Barclay, Esq., M.P.; T. Raymond Barker, Esq.; S. Bennett, Esq.; W. R. Browne, Esq.; F. Burke, Esq.; Colonel Challoner; F. C. Cherry, Esq.; E. D. Davenport, Esq.; John Ellman, Esq.; H. Gibbs, Esq.; B. T. B. Gibbs, Esq.; C. Hillyard, Esq.; W. Fisher Hobbs, Esq.; John Hudson, Esq.; S. Jonas, Esq.; Rev. C. E. Keene; George Kimberley, Esq.; John Kinder, Esq.; Colonel Mac Donall; R. Milward, Esq.; E. W. W. Pendarves, Esq., M.P.; Philip Pusey, Esq., M.P.; F. Pym, Esq., J. Allen Ransome, Esq.; Prof. Sewell; J. V. Shelley, Esq.; W. R. C. Stansfield, Esq., M.P.; C. Stokes, Esq.; H. S. Thompson, Esq.; C. Hampden Turner, Esq.; George Turner, Esq.; George Wilbraham, Esq.; and Henry Wilson, Esq.

Finances.—Col. Austen, M.P., Chairman of the Finance Committee, presented to the Council the Report of the Committee on the state of the funds of the Society at the end of the previous month; from which it appeared that, on the 30th of April last, the invested capital of the Society stood at 7,000*l.* stock, and the current cash balance in the hands of the bankers at 1,482*l.* The quarterly statements of receipt and expenditure, estimated income and liabilities, and permanent investment, were also duly laid before the Council by the Chairman of the Committee, and approved.

Prizes for Essays.—Mr. Pusey, M.P., Chairman of the Journal Committee, submitted to the Council the following schedule of subjects for essays and reports, to be competed for as prizes in 1847, agreeably with a detailed statement of conditions and dates of delivery,

which would be drawn up and presented for publication at a future meeting, namely—

On the Farming of Northumberland.....	£50
On the Farming of Suffolk	50
On the Farming of Somersetshire	50
On the Management of Sheep	20
On the Cultivation of Wheat	20
On the Cultivation of Mangold-wurzel	20
On Paring and Burning	10
On Flax	20
On the great Level of the Fens: history of the drainage, view of its present state, and account of the defects which still require to be remedied	50
For an account of the best Manure for Wheat, compounded of chemical ingredients; to be tried by Judges appointed by the Society	30
For an account of the best Manure for Turnips, compounded of chemical ingredients; to be tried by Judges appointed by the Society.....	30

Chemical Analysis.—Mr. Pusey also laid before the Council the Report of the Committee on the Analysis of the Ashes of Plants, in which were detailed the progress made by the Committee in carrying out the views of the Council in reference to the question submitted for their consideration, the division of the subject proposed by the Committee for adoption, and the appointment of a Sub-Committee to confer, previously to the final arrangements of the Committee, with parties into whose hands it is intended that particular branches of the investigation shall be placed. The following are the six heads into which it is proposed by the Committee that the inquiry into the Ashes of Plants should be divided—namely:—

1. *White Crops*—Wheat, Barley, Oats, and Rye.
2. *Root Crops*—Turnips, Swedes, Beet, Carrots, Parsnips, Potatoes, and Jerusalem Artichokes.
3. *Leguminous Crops*—Beans, Peas, Vetches, Lentils, &c.
4. *Fodder Crops*—The Clovers, Saintfoin, Rye-grass, and the Natural Grasses.
4. *Crops with Oily Seeds*—Hemp, Flax, Rape, Gold of Pleasure, Sunflower, &c.
6. *The Woods* of various trees.

The Council having confirmed this report, resolved that in addition to 350*l.*, the sum already placed at the disposal of the Committee for carrying out the investigation, the further sum of 250*l.* should be granted, in order that 100*l.*, as suggested by the Committee, may be placed to the account of each of the six heads of the inquiry, for the period of the ensuing two years, during which it is intended that the investigation shall be carried on, and for the exigencies of which, in their opinion, that sum will in each case amply suffice.

Newcastle Practical Discussions.—Mr. Pusey further submitted to the Council the Report of the Newcastle Discussion Committee, containing the following recommendations:—

1. That Professor Johnston, one of the Honorary Members of the Society, should be requested to read a paper before the Members at Newcastle-upon-Tyne, at five o'clock in the evening of Tuesday, the 14th of July, on the Chemical Principles involved in the preparation of Manures, and their action upon Crops: with chemical demonstrations.
2. That Mr. Parkes, the Consulting Engineer to the Society, should be requested to read a paper before the members, at Newcastle-upon-Tyne, at five o'clock in the evening of Wednesday, the 15th of July, on the subject of Draining.

3. That the reading of each of these papers be followed by a discussion on the practical bearings of the respective subjects, and the communication of individual experience in reference to their details, under such regulations as the President may decide.

4. That the discussion, after Mr. Parkes's paper, on Wednesday, be closed by the reading of the Judges' award of Prizes.

5. That all persons attending on these occasions be admitted by free tickets, to be obtained of the Secretary; it being left to the consideration of the General Newcastle Committee in what manner regulations may be best effected for the admission of strangers, after due provision shall have been made for the accommodation of the members of the Society.

This report was adopted and confirmed by the Council.

Exhibition of Poultry.—The request of the Newcastle Local Committee, for space in the Show-yard at the ensuing Country Meeting of the Society at that place in July, having been read, the Council resolved that such space should be allowed for that purpose as may be required, and that the notice, entry, and adjudication in reference to that portion of the exhibition in the Society's Show-yard, should be made agreeably with the 27th regulation of the Show.

Exhibition of Wool.—Mr. B. Gibbs having called the attention of the Council to the question of the entry of wool in competition for the prizes in that class offered by the Society for adjudication at Newcastle, on the motion of Mr. Fisher Hobbs, the Council agreed to the following resolution:—"The fleeces exhibited shall have been taken from the same flock, fed together during the six months prior to the time of shearing; such flock having during that period been *bonâ fide* the property of the exhibitor, who shall be required to specify on his certificate whether the sheep have been kept in a house or not."

Auctioneers.—The Council having decided that it would this year be desirable that the sale by auction should be divided between two professional parties, on the motion of Mr. Milward, seconded by Mr. Fisher Hobbs, they unanimously appointed Mr. Wetherell, of Durham, to be the Society's auctioneer at the Newcastle meeting for the sale of cattle and horses, and Mr. James Chrisp, of Newcastle, to be the Society's auctioneer on the same occasion, for the sale of sheep, pigs, and implements: on the condition of each party's agreeing to abide by the established regulations of the Society in reference to the sale by auction.

Corporate Agreements.—The Duke of Richmond then moved the following resolution, of which Mr. Miles, M.P., had given due notice at a former meeting, namely:—"That in future no agreement which may be entered into with local authorities relative to the place of the annual Country Meeting, shall be held good, unless the corporate seal, attested by the signature of the mayor, shall be affixed to such document." This resolution was agreed to accordingly.

Annual Country Meeting of 1847.—Earl Spencer, Chairman of the Local Inspection Committee for the Country Meeting of 1847, having laid before the Council the report of the Committee on the result of their personal inspection of the various localities they had visited in accordance with the instructions of the Council, Mr.

Raymond Barker, Mr. Bennett, and Mr. Brown proceeded to explain in detail the accommodation respectively afforded by each of the towns which as members of the Committee they had visited, and the nature of the sites proposed in each case by the authorities for the purposes of the meeting; and the Secretary laid before the Council the whole of the documents he had received from the authorities of cities and corporate towns throughout the district of that year's meeting. The Council then received the deputations who had come to town for the purpose of advocating the claims of the localities they respectively represented, and who, having guaranteed to the Council the authenticity and accuracy of the memorials and other documents transmitted by their respective authorities, afforded such further information as the members present required. The President expressed to each of the deputations who had thus favoured the Council with their attendance, the best thanks of himself and the Council for the honour they had done the Society in the several invitations they had given to the members at large to hold their Country Meeting in one of their respective localities, and for the kind trouble they had taken in preparing and transmitting the various plans and reports required by the regulations of the Society, prior to the selection of any particular city or town as the place of the Country Meeting.

The deputations then withdrew, and the Council proceeded to the consideration of the relative capabilities of each of the localities proposed for the occasion of the ensuing meeting, as well as the largest amount of accommodation offered by each of them for the purposes of the meeting, and the general convenience of members of the Society, and the visitors attending on the occasion.

The Council finally decided that Northampton should be selected as the place of the Country Meeting of 1847, for the district embracing the counties of Northampton, Warwick, Bedford, Buckingham, Berks, Oxford, Huntingdon, and Hertford, subject to a due execution within the ensuing week of the formal agreement required by the rules of the Society. The President stated that he should order a Special Council to be summoned for Wednesday next at 1 o'clock, to receive and ratify that agreement, and resume the consideration of the Report of the Rotation of Districts Committee, in reference to Districts for the Country Meetings of 1848-55.

General Meeting.—The Council decided that one o'clock in the afternoon should be fixed as the hour of the General Meeting on Friday, the 22nd instant. They also agreed to the house list of the Council, required by the bye-laws of the Society, and gave orders for the preparation of a provisional prize sheet for 1847, to be laid on the table for the inspection and suggestions of the Members who might attend on that occasion. The President stated that a Special Council would be held on Wednesday, the 20th instant, at one o'clock, for taking into consideration the Report of the Council to the General Meeting.

Judges.—The Council then appointed the following Committees for the recommendation to the Council of such Judges as they might select from the lists of nomination transmitted by members to the Secretary, or de-

livered by them personally to the President on the day of the General Meeting: all members of the Society being invited to nominate accordingly such Judges as they may wish to recommend for particular Classes of the Show, agreeably with the privilege granted to them by the bye-laws.

Committee for Judges of Stock.—Earl Spencer, Mr. Stokes, Mr. Druce, Mr. H. Gibbs, and Mr. Shaw.

Committee for Judges of Implements.—Mr. Thompson, Mr. Pusey, Sir John Johnston, Mr. Miles, and Mr. Shelley.

The Council ordered that the Committee, appointed Nov. 5, 1845, to consider the best mode of providing for the accommodation of the Judges, and regulating the rate of their remuneration, be directed to meet for business.

The President laid before the Council a collection of papers received from Sir John Ogilvy, Bart., connected with the proceedings of the Chemical Association in Scotland and the Potato disease; the Earl of Erne reported the steps he had taken to obtain the information on Flax requested by the Council; and Mr. Thompson presented 76 full-sized heads of Wheat grown from one grain, and 160 heads of Barley also from one grain, by Colonel Croft, in his garden, at Stillington, Yorkshire.

The Council then adjourned to Wednesday, the 13th inst.

A Weekly Council was held at the Society's House in Hanover square, on Wednesday, the 13th of May. Present—The Right Hon. Lord Portman, president, in the chair; Duke of Richmond; Hon. R. H. Clive, M.P.; Sir Charles Lemon, Bart., M.P.; Sir Matthew White Ridley, Bart.; Sir John V. B. Johnston, Bart., M.P.; Colonel Austen, M.P.; T. Raymond Barker, Esq.; H. Blanchard, Esq.; F. C. Cherry, Esq.; Colonel Challoner; H. Gibbs, Esq.; C. Hillyard, Esq.; W. Fisher Hobbs, Esq.; John Kinder, Esq.; J. H. Langston, Esq., M.P.; Colonel MacDouall; E. W. W. Pendarves, Esq., M.P.; Prof. Sewell; George Turner, Esq.; Geo. Wilbraham, Esq.; T. B. Batard, Esq.; Colonel Blagrove; Capel Cure, Esq.; A. E. Fuller, Esq., M.P.; W. Hervey, Esq.; Rev. C. E. Keene; A. Ogilvie, Esq.; E. Parkyns, Esq.; G. Parsons, Esq.; H. Price, Esq.; J. Roddam, Esq.; H. Smith, Esq.; T. Turner, Esq.; and T. R. Tweed, Esq.

Tussac Grass.—Viscount Palmerston, M.P., transmitted to the Council the following communication on the subject of Tussac Grass, addressed to his Lordship by Lieut. Moody, Governor of the Falkland Islands:—

*"Government-house, Port William,
Falkland Islands, 8th Jan., 1846.*

"I have the honour to acknowledge the receipt of a note from your lordship, dated 5th April, 1845, and have much pleasure in attending to the wishes therein expressed. I beg to state that the person who collects the Tussac seed is a poor man, named C. J. Dettleff (a native of Hamburg), whom I am encouraging to make a trade with it. I am forwarding 8lbs. of the seed by the merchant brig "Hebe," C. S. Anderson, master, bound for London; agent for the brig in England, Captain Faith, Lloyd's Coffee House, London. I have

given the master ample directions to insure the delivery of the seed to your lordship. Dettleff's charge for the seed is 2*l.* 10*s.* per lb. I beg to suggest that the best way to pay Dettleff for the seed would be for your lordship to cause the sum, namely 20*l.*, to be paid to my account at my agents, Messrs. Cox and Co., Charing Cross, and advice of the same to be forwarded to me. I will then pay over the amount to the man, and forward the receipt to your lordship's agent.

"The price charged at present for the seed appears to be high, but it takes a long time and much care to collect, as well as considerable personal inconvenience to the poor man under the present circumstances of the colony.

"The portion of your lordship's property described in the note appears to be well suited for the growth of this grass, if the blowing sand be not more than two feet deep near the beach, and fortunately rest on peat or peaty soil, no matter how thin. If the shore be bold, and the sea bank high and rocky, I should choose the most exposed points. If the spray, but not the actual wave, dashes over it, so much the better. I do not think that sowing it in the shifting sand would answer in the first instance, though when the grass once takes root in any soil, the drift sand blowing over it, amongst it, and almost burying it, does not seem to injure it. I would try some in the sand that has been fixed by the bent, but as near the sea as possible. The Tussac loves the spray, and the finest plants are almost growing in the water. If the breezes from the sea carry a great quantity of moisture to the peat bog behind the tract of sand, I conceive the Tussac grass would answer extremely well in it. We have Tussac grass growing on peat bogs on exposed islands in the Falklands, in places 800 and 1,000 feet above the sea, but these sites are exposed to the westerly gales, which are laden with moisture. Some of the finest young plants I have seen grew from seed sown in rich mould in my garden, 300 yards from the shore of a deep inland harbour, and protected from the winds by a high turf wall. This artificial mode seems to contradict what I before stated. Nature prefers the first mentioned places, but as the latter is a fact, I would recommend both to be tried. In the garden I was so successful with the plants from seed, that I proceeded to transplant suckers from the wild ones on the rocky shore to the rich mould in the garden, and I found them to thrive vigorously. I took suckers from these again, also from the plants raised by seed, and planted out more rows. Every plant answered admirably. I cut them down, and they grew more bushy and spread, throwing out fresh suckers. I should soon have filled a paddock with the plants, but as it was necessary to change the site of the chief town, I had to abandon my garden, and begin new and arduous labours, which have occupied the time of all hands too much to spare any for experimental agriculture. In laying out a piece of ground for Tussac grass, the following circumstances must be borne in mind. The plant grows in bunches, occupying from 2 to 3, and sometimes even 5 feet in diameter, and the blades of grass, when full grown,

are 7 or 8 feet long. The roots seem forced up from the ground, and I have been in patches of fine full-grown Tussac, in which a man on horseback is almost concealed. I should, therefore, sow the seed in rows 2 feet apart, some in a garden, and some on exposed points of peaty soil close to the sea, and within reach of the spray, carefully weeding between the plants as they grow up. When they are 9 inches or a foot high the suckers might be separated and planted out 3 feet apart in rows. As the plants grow large every alternate row should again be planted out, in order to leave room for a man, cow, or horse, to pass between the rows without treading down the plants. To raise from seed appears a more uncertain and much slower method than that of planting out suckers from the finest plants.

"With regard to the value of Tussac as a fodder, particularly for winter, I will mention a few facts that may be interesting. It is green all the year round. Frost does not appear to injure it, nor does snow cover it. It is a soft, succulent, and highly nutritious grass, extremely relished by all animals, cattle, horses, sheep, and pigs. Cattle and horses fatten upon it in a surprising manner. They eat the whole blade down to the root, which, by the way they relish most. They will eat old dry Tussac thatch from off the roofs of houses. The tracts of wild cattle and horses in the Falklands extend from many miles inland to the exposed sea-beaten points covered with Tussac. There is an island in Berkeley Sound that can be reached at low water from the main. The area of this island is as nearly as possible 800 acres, and there are about 400 acres of Tussac Grass upon it; the remainder of the island is thinly covered with coarse wing grass and rush, on peat bog, a very wretched piece of pasture land, affording scarcely any nutriment. Last autumn I caused the Government herd, consisting of 800 head of cattle and about 60 or 70 horses, to be placed on this island for the winter months. A small house is at the extremity of the ford, in which I placed a guard. The animals remained on the island nearly six months, with no other nutriment than what the island afforded. Towards the end of that time they began to get poor, and the Tussac was eaten down to the roots. By next autumn it will have entirely recovered. I am compelled to let the cattle graze the Tussac from want of hands and means to make different arrangements; nor do I consider any other plan a matter of sufficient moment in the present state of the colony, as to warrant the outlay requisite to economise properly this invaluable food. But in England, where labour is cheap, I would act differently. The cattle could be folded in an adjoining paddock to the field of Tussac, and fed over the wall or fence by men cutting the Tussac in bundles, commencing with the upper row and passing regularly through the field; by the time they had cut the last row the first would be ready to cut again. Had such a plan been adopted by me in the island I mentioned above, I feel confident the 400 acres of Tussac would have amply supplied the 800 head of cattle for twelve instead of six months; it is incredible how much is injured by being trodden down and eaten too close, and the horses, from

preferring the root, do more mischief than the cattle. I have no data to say decidedly how many animals one man could cut food for in a day, and to attempt to do so might only mislead your lordship. I ought to mention that the plant is of slow growth, and would probably be three years in coming to perfection, during which period, however, it might be cut annually with advantage. When once full grown it springs up rapidly after being cut down, the blades reaching their full height of seven feet by the end of summer, though cut down in the spring. I kept up a favourite horse in a loose box one winter, and had him fed entirely on Tussac cut for him and given green. He ate it greedily, and was always in excellent condition; but, as a general rule, I should consider it soft food for a horse doing any work.

“When it is remembered that this invaluable provision of Nature thrives luxuriantly where scarcely any other vegetation will exist, that it is most nutritious and much relished by cattle, it is impossible to resist feeling the most earnest desire to see it extensively tried in those portions of the United Kingdom which, in climate and soil, bear some resemblance to the Falkland Islands. I might easily expatiate on the extreme beauty of its vegetation, covering rocky, storm-beaten promontories and small islands with a dark rich verdure, always reminding me of tropical luxuriance; but its importance in a practical point of view is what I am desirous of making fully known to your lordship, and to all interested in agricultural pursuits. I should wish to send a large quantity of Tussac seed to England every season, but the settlers here are, as yet, far too few in number, and far too busy to spare time to collect it. It appears to me it would be money well laid out if one of our leading Agricultural Societies were to send here an intelligent person, to remain the six summer months, collecting seed. He would be absent from England about a-year, and the whole expense would not exceed 300*l*. He should bring either a wooden or iron house, ten feet square, with a small stove; three tons of coal; provisions, such as biscuit, pork, coffee, and sugar; gunpowder, shot, warm clothing, bed and blankets, a folding table, two stools, and a military canteen. More things would be an incumbrance. Dettleff, whom I have mentioned above to your lordship, usually goes from the settlement on foot, and takes only a good dog and a stick. He is absent about two months, sleeps under a rock, lives on wild geese and rabbits, and occasionally a calf, and invariably returns in the best possible health. A person from England might, however, fix his little residence on a small Tussac island, close to the settlement, and at present reserved by Government, and in one summer collect such a quantity of seed, with Dettleff's aid, as would more than cover his expenses, to say nothing of the advantage of having a good authority at home that could be referred to at any moment. I have given a close attention to this Grass for four years, and though at first it may appear a dreamy kind of enthusiasm, I do not hesitate to say that, should it be found, on trial, to succeed in the United Kingdom as well as it does in the exposed portions of the Falkland Islands, it will raise the annual income of many landed

proprietors from hundreds to thousands. A Tussac-fed ox is in the finest order here at the end of the winter, though never housed or cared for in any way. In the *Falmouth Packet and Cornish Herald* newspaper of 23d August, 1845, I have been shown a paragraph, stating that I, Matheson, M.P., of Lewis and Achany, sent some Tussac Grass seed, procured from the Falkland Islands, to Stornaway, and that Roderick Nicolson, Esq., tackman of Colb, has been perfectly successful in raising Grass from the seed. I should be glad to hear of some of the seed being sown in the salt-water marshes near Southampton, Dungeness, Isle of Sheppey, the fens near the Wash in Lincolnshire, the banks of the Thames and south shore of Essex round to Harwich; in short, anywhere near the sea, preferring, as a general rule, marsh and peat bogs to sand hills or downs, although I would always try both. I would also be glad to hear of some having been tried on inland bogs, as the bog of Allenand, Chalmop. I have forgot to mention that I would sow the seed very early in the spring, and not too deep. I need not say that it will be a source of pride to me to be of any service to your lordship, either in procuring seed or affording information at any time.”

“(Signed) “R. C. MOODY.”

Lord Palmerston, as a member of the Society, particularly called the attention of the Council to that part of the communication which had reference to the collection of the seeds of the Tussac grass, and thought that if the Royal Agricultural Societies of England and Ireland considered it worth while to act upon Governor Moody's suggestion of sending out some person to the Falkland Islands for that purpose, they might make an arrangement together for sharing the expense and dividing the produce of the expedition proportionally between them.

The Duke of Richmond favoured the Council with the result of his own trials of the Tussac grass on different soils in the north of Scotland, on his estates near Gordon Castle. The seed had been furnished to his Grace by Sir Wm. Jackson Hooper, of the Royal Gardens at Kew, and was sown in garden mould, sandy soil, and peat. The peat consisted of a waste marsh or bog, covered in easterly gales with spray from the sea, on which nothing grew, and where snipes were the only tenants. It was found that not a single blade of the Tussac grass grew excepting in the peat, where it was found to succeed well, and appeared a good grass. Colonel Mac Douall stated that his own trial of the Tussac grass had furnished a result exactly corresponding with that obtained by the Duke of Richmond, none of the plants coming up excepting in peat.

The Council ordered their best thanks to be conveyed to Lord Palmerston for the favour of his communication, with a request that his lordship, as well as the Duke of Richmond and Colonel Mac Douall, would from time to time lay before the Society the progress of their respective experience in the cultivation of the grass in question.

Clover Hay.—Mr. Joseph Blundell, of Maidenstone Heath, near Hound, Hampshire, transmitted to the Council a sample of white Dutch clover hay, stacked

in 1841, along with the following explanation of the advantages which he had found it to possess as a fodder, in conjunction with turnips, for his early lambs:—"Being a member of the Royal Agricultural Society, I have taken the liberty of sending for inspection a sample, or a specimen, of white Dutch clover hay; and although taken from the centre of a stack, and being a little too much heated to be a good sample of well-made hay, still I consider it a perfect specimen of the herbage and kind of clover requisite for the making first-rate hay for the purpose of feeding early lambs in conjunction with turnips, &c. This sample was taken from a stack of 16 tons, the produce of 11 acres of land, and grown in the year 1841 on my farm at Maidenstone Heath, Hound, Southampton. I shall feel obliged if you will present this sample of hay to the Council at their next meeting, my object being to inform them of the sort of hay which I have found to be highly beneficial in the fattening of early lambs, for which purpose I have used it with great success for some years past. Should this communication be deemed worth notice by the Council, and any statement be required regarding the cultivation of the clover, or the making of the hay, I shall feel happy to furnish it at any time."—The best thanks of the Council were ordered to Mr. Blundell for this letter and the sample of clover hay which accompanied it.

Weeds among Wheat.—Mr. Fuller, M.P., of Ashdown House, near East Grinstead, transmitted fresh specimens, in yellow bloom, of a weed which proved very troublesome in his wheat land, and remained still in possession of the soil, having resisted all his efforts to effect its extirpation. It is known locally as the "hedge hog," or "periwinkle" weed, and is of so vigorous a character, that unless the wheat plant is very strong, it soon overruns it. The weed comes up along with the wheat, and stands the winter equally well, its growth in summer being of corresponding amount to that of the wheat, to the plant of which it is very injurious. The seeds are very rough. Mr. Ogilvy remarked that he had found, as the result of his own experience, that wild mustard, and all other weeds likely to infest a crop of wheat, may be destroyed previously to the sowing of the grain, by having the land ploughed several weeks before sowing, in order to give the weeds an opportunity of vegetating by such exposure of the under-soil to external influences; the weeds, at the time of sowing, having become so far advanced in their growth as to be irrecoverably injured by the harrows passing over them.

Prizes for Sheep.—As the Society's prizes for mountain sheep, to be awarded at the ensuing Newcastle Meeting, are not exclusively designed for any particular variety of mountain breed of established celebrity, but open without exception to the general competition of "sheep best adapted to a mountain district," Mr. Glover, Secretary of the Newcastle Local Committee, addressed a communication to the Council, on the part of that committee, recommending that the general character of the Society's prizes should be changed into an exclusive one in favour of the Cheviots, and that the offer of prizes now made to the Council by the members of

such committee for the black-faced breed should be accepted; and Mr. Robson, as Secretary of the North-Tyne and Redesdale Cheviot Sheep Show, conveyed the wish of its members that the Council would accept their offer of a first, second, and third prize for the best pen of three fifteen months old or shearing rams, of the pure Cheviot breed. The Council decided—1. That the Society's object is to have their prizes awarded, without distinction, to such sheep as, in the opinion of the judges, are the best adapted to a mountain district. 2. That, by the bye-laws of the Society, no alteration can now be made in the prizes offered by the Society. 3. That, by the 27th regulation, namely—"In case any gentleman, or number of gentlemen, should wish to offer a prize for any class of stock not distinctly specified among the prizes offered by the Society, he or they will be allowed to offer such prize at the meeting at Newcastle-upon-Tyne. The stock which may compete for that prize shall be exhibited, subject to the conditions that shall be decided upon by the Council, and the prize awarded by such of the judges as the Council shall select. Animals exhibited for that prize shall not be prevented from competing for any of the prizes offered by the Society for which they are qualified:"—the gentlemen composing the two bodies in question are allowed to offer the prizes for Cheviots and black-faced sheep. The Council then instructed the Secretary to communicate with Mr. Glover and Mr. Robson accordingly, informing them at the same time that by the rules of the Society, June the 1st would be the latest day on which certificates for the entry of any stock whatever for the Show could be received.

Glass Milk-Pans.—Messrs. Edwards and Pell, of 15, Southampton-street, Strand, presented to the Council two glass Milk-pans of their manufacture—one of a dark, and the other of a light green colour. The manufacturers informed the Council that as the Milk-pans were cleaned with so much ease, the use of scalding water for the purpose of cleansing them was found to be unnecessary; and also that they were of such strength of material as to be enabled to stand a very severe blow without breaking. The average weight of the pans of dark green glass was 8lbs., and the price 3s. 9d.; that of the light green glass 10lbs., and the price at the rate of 8d. per lb.

Mr. Wetherell communicated his acceptance of the appointment of Auctioneer at the Newcastle Meeting, subject to the regulations of the Council.—The Rev. John Barlow, Secretary of the Royal Institution of Great Britain, signified his willingness to give a free admission to Members of the Society on the occasion of the Rev. E. Sidney's Lecture in the theatre of that establishment on the 15th of May, "On the Nature of certain Fungi attacking the Agricultural Produce of this Country."—Communications on the growth of sound Potatoes from diseased tubers, from Mr. Fuller, M.P., and Mr. Wing, of Fordingbridge; and on the storing of Potatoes of the "hen's-nest" variety in fine Lynn sand, from Sir M. W. Ridley.—A paper from Mr. H. B. Morris, of Ramsgate, on the Keeping of Farm Accounts; which the Council referred, along with all

other documents on this subject, to Colonel Challoner, Mr. Tawney, and Mr. Kimberley, as the Committee appointed by the Council to report on the best mode of Keeping Farming Accounts.—The Weekly Council then adjourned to Wednesday next, the 20th of May, and the Members of Council and Governors present proceeded to the business of the Special Council.

Special Council.—Lord Portman, President, in the Chair.

The agreement of the Society with the authorities of Northampton was duly ratified by the Council, and completed in duplicate agreeably with the terms of the Charter.

The following arrangements were made for the Districts of the Country Meeting:—

1848.—The Yorkshire District (comprised of the County of York).

1849.—The Eastern District (comprised of the Counties of Essex, Suffolk, Norfolk, and Cambridge).

1850.—The Western District (comprised of the Counties of Wilts, Dorset, Somerset, Devon, and Cornwall).

A Weekly Council was held on Wednesday, the 20th May; present, the Right Hon. Lord Portman, President, in the chair; Duke of Richmond; Earl Spencer; Earl of Egmont; Hon. R. H. Clive, M.P.; Hon. J. Carnegie; Sir M. W. Ridley, Bart.; Sir Robert Price, Bart., M.P.; Sir John V. B. Johnstone, Bart., M.P.; W. R. Browne, Esq.; Col. Challoner; S. C. Cherry, Esq.; E. D. Davenport, Esq.; H. Gibbs, Esq.; C. Hillyard, Esq.; J. Kinder, Esq.; Col. MacDonall; W. Miles, Esq., M.P.; R. Milward, Esq.; E. S. Chandos Pole, Esq.; P. Pusey, Esq., M.P.; F. Pym, Esq.; E. A. Sanford, Esq.; Professor Sewell; R. A. Slandy, Esq.; W. R. C. Stansfield, Esq., M.P.; W. B. Wingate, Esq.; B. Almack, Esq.; T. B. Browne, Esq.; H. Burr, Esq.; G. Darby, Esq.; C. Eyre, Esq.; Dr. Fownes; A. E. Fuller, Esq., M.P.; J. B. Glegg, Esq.; H. Hudson, jun., Esq.; E. Hussey, Esq.; Rev. C. E. Keene; H. Price; J. Roddam, Esq.; S. Solly, Esq.; T. R. Tweed, Esq.; D. C. Webb, Esq.; J. Wood, Esq.; and Francis Woodward, Esq.

On the motion of the Duke of Richmond, seconded by Sir Robert Price, Bart., M.P., the thanks of the Council were voted to the Railway Companies who had granted a reduction on their usual charges in favour of exhibitors at the Newcastle meeting of the Society.

Communications were received from Mr. Chrisp, of Newcastle, accepting the office of one of the auctioneers at the ensuing Country Meeting of the Society, under the regulations prescribed by the Council; from Mr. Dickson, presenting a copy of his work on Flax; from Mr. Glover, Sec. to the Newcastle Local Committee, on the subject of Prizes for Poultry and Black-faced Sheep; from Mr. Curtis, R.N., on a manure composed of fishy matter and lime; from Mr. Milward, a present of a work on Keeping Farming Accounts; from Mr. Parkinson, of Leyfields; from Mr. Purchas, on results in the employment of Acid and Bones as a Manure; and from Prof. Sewell, a Specimen of Salts which having been sold as "Glauber's Salts," had poisoned three cows, the salts proving to be not Glauber's Salts (sulphate of soda),

but the nitrate of soda. Interesting discussions and statements of facts having followed the presentation of these several communications, the Council adjourned to Wednesday, the 3rd of June.

A SPECIAL COUNCIL was then held, the Right Hon. Lord Portman in the chair, for the purpose of agreeing to a report of the Council to the General Meeting.

THE GENERAL MAY MEETING was held on Friday, May 22, at the Society's House in Hanover Square; present, the Right Hon. Lord Portman, President, in the chair. Earl of Ducie, Viscount Torrington, Lord Camoys, Hon. J. Carnegie, Hon. H. W. Wilson, Sir Matthew White Ridley, Bart.; Sir Richard Paul Jodrell, Bart.; Sir Trayton Elliott Drake, Bart.; Sir Robert Price, Bart., M.P.; Sir Henry Dymoke, Bart.; Sir John Ogilvy, Bart.; Sir Samuel Hancock, Knt.; Colonel Austen, M.P.; Colonel Blagrove, Colonel Challoner, Colonel Elwood, Colonel Scudamore, Colonel Smith, Rev. D. Gwilt, Rev. C. E. Keene, Rev. James Linton, Rev. J. R. Smythies, Professor Sewell; Messrs. B. Almack, R. Archbold, M.P.; J. Ambrose, T. Raymond Barker, J. Barton, S. Bennett, N. Blake, J. Brown, T. B. Browne, W. R. Browne, T. Carpenter, A. H. Cherry, F. C. Cherry, G. Curteis, James Dean, W. Dickinson, Jos. Druce, S. Druce, Edwin East, John Ellman, C. Eyre, W. Flack, A. E. Fuller, M.P.; H. Gibbs, B. T. B. Gibbs, H. J. Grant, S. Grantham, J. B. Glegg, W. Greaves, G. Heneage, J. Hercy, C. Hillyard, J. H. Hippiusley, John Hudson, E. Hughes, H. Justice, T. J. Kelsey, John Kinder, T. Knight, A. Lawson, M.P.; J. B. Lawton, J. Laycock, H. Martin, R. Milward, D. Neave, C. Newman, A. Ogilvie, J. Pakington, W. Pinney, E. S. Chandos Pole, Peter Pole, H. Price, H. Putland, R. Randall, E. A. Sanford, M.P.; S. Selmes, T. Severne, R. A. Slaney, S. Solly, W. R. C. Stansfield, M.P.; M. Stevens, C. Stokes, W. Stutfield, H. Stafford, C. Smythies, T. D. F. Tatham, S. B. Taylor, W. Trinder, C. Hampden Turner, T. Turner, W. B. Turner, T. R. Tweed, Jonas Webb, J. A. Williams, F. Woodward, and R. Worthington.

On the motion of Lord Camoys, seconded by Colonel Challoner, the Earl of Egmont was unanimously elected President of the Society for the year ensuing the rising of the Newcastle Meeting, on the 18th of July next.

On the motion of R. A. Slaney, Esq., seconded by J. Dean, Esq., the Vice-Presidents, and on that of R. Berens, Esq., seconded by T. Raymond Barker, Esq., the Trustees of the Society were unanimously re-elected.

E. A. Sanford, Esq., James Dean, Esq., and Thomas Knight, Esq., having been nominated Scrutineers for the election of 25 members of Council, the House List was unanimously adopted by the meeting; 18 of the members who went out this year by rotation being re-elected, and the following new members of Council elected, for the ensuing two years, namely, John Bell Crompton, Esq., of Duffield Hall, near Derby; Samuel Druce, Esq., of Ensham, near Oxford; Lord Southampton, Whittlebury Lodge, near Towcester, Northamptonshire; Richard Garrett, Esq., of Leiston, near Saxmundham, Suffolk; William Shaw, jun., Esq., of

Fair-Cotton, near Northampton: Robert Smith, Esq., of Burley, Rutlandshire; and Thomas Umbers, Esq., of Wappenbury, Warwickshire.

REPORT.

The Secretary, by direction of the President, then read the following Report from the Council :

“The economy of remunerative farming is one of the great objects of the Royal Agricultural Society of England, and at the same time one of the principal means through which that science included in the terms of their motto is to be derived and regulated; the observation of well established facts, and the results of actual experiments, being the only ground-work on which they admit that improvements in agriculture can be successfully based; while a clear knowledge of cause and effect under given circumstances, and a detail of the particular cases to which such knowledge is applicable, is, in their opinion, the only safe science to be recommended to their members. The theories of chemical agency, physical forces, and organic action, under the varying conditions of local circumstance or the control of vital influence, are in themselves important objects of inquiry for the philosopher; but it is only when the practical application of their results becomes apparent, that they assume a form in which they can be submitted to the test of trial, or be rationally expected to lend any aid in promoting the improvement of practical agriculture. Accordingly, whilst calling in the aid of science to agricultural practice, the Council have felt it their duty to discourage every attempt to introduce vague theories, especially when it has been found by experience that much steady progress may be made in the improvement of agriculture, by the obvious means of applying to one locality that system of management which has been proved to be successful in another similar locality.

“In order to maintain a knowledge of the most approved systems of husbandry, practised in different localities, the Society not only holds its Country Meetings, from year to year, in various districts, but incites and remunerates by its prizes for County Reports, and Essays on distinct topics of inquiry, that communication of practical experience which, by publication in the ‘Journal,’ becomes accessible to the agricultural community. At those Meetings, the knowledge of local excellence, acquired on the spot, is repaid by the exhibition of whatever has been found most desirable in breed of stock, or economical in the construction of implements; and that mutual interchange of opinion amongst farmers themselves which tends to establish a good understanding among all parties connected with agricultural pursuits, and to remove those local prejudices which have so long retarded its progress.

“Since the last General Meeting in December, the Council have had under their consideration the details connected with the following general subjects:—

1. The FINANCES of the Society;
2. The ANNUAL COUNTRY MEETINGS; and
3. The PRIZES for Reports and Essays for 1846 and 1847.

“FINANCES.—The Finance Committee have prepared, agreeably with the order of the Council, the first return of a quarterly statement of the receipts and payments,

estimated income and liabilities of the Society, which will in future be made at the end of every three months. They have also submitted to the Council their Report on the funded property of the Society, and the arrears of subscription, as well as their final balance-sheet of the Shrewsbury Meeting account.

“The Finance Committee reported, at their last monthly meeting, that the invested capital of the Society consisted of 7,000*l.* stock, and that the current cash-balance in the hands of the bankers amounted to 1,482*l.*; and that the arrears of subscription on the 31st of December stood as follows:—

1841	3	Governors at 5 <i>l.</i>	cash	... £	15
	321	Members at 1 <i>l.</i>	”	...	321
	4	Governors at 5 <i>l.</i>	”	...	20
1842	617	Members at 1 <i>l.</i>	”	...	617
	10	Governors at 5 <i>l.</i>	”	...	50
1843	1094	Members at 1 <i>l.</i>	”	...	1094
	18	Governors at 5 <i>l.</i>	”	...	90
1844	1582	Members at 1 <i>l.</i>	”	...	1582
	47	Governors at 5 <i>l.</i>	”	...	235
1845	2702	Members at 1 <i>l.</i>	”	...	2702
Total					... £6726

“76*l.* has been discharged from the arrear account between the last general meeting on the 3rd of December, and the end of that month; and a further reduction of 336*l.* has been effected during the present year. According to the bye-laws all subscriptions for the current year remaining unpaid on the 1st of June become in arrear, and no member whose subscription is so in arrear, is allowed to enjoy any of the privileges of the Society.

“Since the last General Meeting in December, 243 new members have been elected, 30 have died, and 81 have been struck off the list, and the Society now consists of—

Life Governors	...	92
Annual Governors	...	201
Life Members	...	554
Annual Members	...	6105
Honorary Members	...	19
Total...		6971

“The Auditors of Accounts on the part of the Society have presented, through the Finance Committee, their report of the Society's accounts to the end of the last half-year, which will be read to you by the Chairman of the Committee.

“COUNTRY MEETINGS.—The Council have decided that the Annual Country Meeting of the Society to be held this year at Newcastle-on-Tyne, shall take place in the week commencing the 13th of July; Thursday, the 16th of that month, being the principal day of the show, and the day of the Pavilion dinner; and in order to increase the interest and usefulness of the occasion, they have been led by the success of their weekly Council Meetings in London, at which discussions and communications of important matters have so frequently occurred, to give up the Council dinner on the Wednesday, for the purpose of adopting in its place discussion and interchange of opinion, having reference to agricultural topics of practical interest, on a more extended scale, and under distinct regulations, for insuring to the members present the opportunity of both acquiring and communicating information. The Council have accordingly arranged that on the evening of Tuesday, the 14th

of July, at 5 o'clock, Prof. Johnston, of Durham, one of the honorary members of the Society, will read a paper 'On the Chemical Principles involved in the Preparation of Manures, and their Action upon Crops;' with chemical demonstrations: and on the following evening, at the same hour, Mr. Parkes, the consulting engineer of the Society, will read a paper on the subject of 'Draining;' each of these papers being intended to form only preliminary introductions to the practical discussions which it is hoped will follow their perusal, under such regulations as the President may at the time decide to adopt. The Judges' award of prizes will be read at the close of the discussion on Mr. Parkes's paper.

"In addition to the Society's Prizes for 'Sheep best adapted to a Mountain District,' the Newcastle Local Committee have offered special prizes under the 27th rule of the Prize-sheet, for Sheep of the Black-faced Breed; and the North-Tyne and Redesdale Cheviot Sheep Show, also special prizes for Sheep of the Cheviot Breed under the same rule.

"By a distinct regulation, the Council have made it a condition with the exhibitors, that they shall execute all orders for Implements given to them in the Show-yard, at the price stated in their certificates.

"The Newcastle Local Committee have undertaken to place the land for the trial of implements under the cultivation desired by the Stewards; and are actively engaged in carrying out the various details connected with other departments of the trial.

"The mode adopted last year for the appointment of Judges for the Show was found so satisfactory to all parties, that the Council have decided again to act upon it. They have accordingly requested the members of the Society at large to send to the Secretary, or deliver personally to the President at the General May Meeting their nomination of persons to act as Judges in any or all of the several departments of the Show; and have appointed two Committees—one for Judges of Stock, and the other for Judges of Implements—to select from these nominations, and to report to the Council for confirmation, the names of those gentlemen, who, in their opinion, are best qualified to perform those important duties.

"The great amount of actual expenses, independently of personal charges and loss of time, incurred by the exhibitors at the Country Meetings of the Society, has frequently engaged the attention of the Council. Last year these expenses were diminished by the liberality of the London and Birmingham, and the Grand Junction Railway Companies, who carried implements and stock to and from the Society's Country Meeting, free of any charge whatever; and the Council have this year the gratifying duty of announcing to the members of the Society, not only a renewal on the part of those two companies of the same most liberal concession, but a free grant of similar privileges in favour of the Society's exhibitors, made by the Great Western, the South-Eastern, and the Newcastle, Shields, and Tynemouth Railway Companies. Other companies, though not granting so entire a freedom of gratuitous transit along their respective lines of railway, have made certain concessions, under special conditions, which the Council have directed

to be communicated to the several exhibitors for their information; namely, the South-Western Railway Company consent to convey stock or implements for the Society's show at one-half the usual charges each or either way, an arrangement which that Company considerably remarks in conveying the grant, 'will give the exhibitors the benefit of the reduction, should they sell any of their stock or implements previously to returning from the show:' the Newcastle and Carlisle Railway Company agree to convey all stock and implements, as well as the persons in charge of them, at half fares, either going to or returning from the Show; also, in case the Council decide to have any ploughing-match, or other exhibition of practical trial, a few miles from Newcastle, they are willing to convey the ploughs and horses, together with the ploughmen and attendants, to and from the place of such exhibition, free of any charge whatever: the Newcastle and Darlington and the Midland Counties Railway Companies decline to accept half-fares, but are willing to give a free back-passage to such implements or stock as shall have already paid the full charges in proceeding along their respective lines to the Show.

"In order to complete the schedule of information required by the exhibitors, the Council have directed a statement to be drawn out of the various conveyances and rates of charge by Sea from every point of embarkation along the eastern coast to Newcastle-upon-Tyne, where the authorities have obtained for the Society certain reductions in the port dues in favour of exhibitors at the meeting.

"At the date when the Council arranged their first succession of the rotation of districts for the Country Meetings, ending with the South Wales district as the one intended for the meeting of 1847, they had not ascertained by actual experience the indispensable necessity of railway accommodation. With a knowledge of the absence of adequate railway accommodation throughout South Wales, and the consideration that the Bristol Meeting of 1842, and the Shrewsbury Meeting of 1845 had been held within the reach of the Principality, the Council have felt themselves compelled to abandon their intention of holding the meeting of the Society for 1847 in the South Wales district.

"The Council have decided on the following as the districts of the Country Meetings for the ensuing four years, and have resolved that every year a new district shall be added in advance to compensate for the one which will annually elapse:—

1847.—The South Midland District (comprised of the counties of Bedford, Berks, Buckingham, Hertford, Huntingdon, Oxford, and Warwick).

1848.—The Yorkshire District (comprised of the county of York).

1849.—The Eastern District (comprised of the counties of Essex, Suffolk, Norfolk, and Cambridge).

1850.—The Western District (comprised of the counties of Wilts, Dorset, Somerset, Devon, and Cornwall).

"The Council have accepted the invitation of the authorities of Northampton to hold the country meeting of the Society for 1847 at that town; and already the Mayor and Corporation, under the great seal of the

borough, have granted to the Society such liberal accommodation for the occasion, as to give reason to hope that the Northampton Meeting will provide in every respect a most successful and important one. In order to ascertain more fully the local feeling on the subject of the prizes offered for any particular year, the Council have, by an alteration in their bye-laws, postponed the final settlement of their prize-sheep from June to December in the year previous to that of a Country Meeting at which such prizes are to be awarded. Accordingly the prizes for the Northampton Meeting will not be finally settled until the month of December, 1846. In the meantime a preliminary prize-sheet for that occasion is laid before the members at their present General Meeting, for the purpose of receiving from them such suggestions as they may think proper to make to the Council.

*“Report and Essay Prizes.—*The Journal Committee have reported the several Essays, required to be sent in for competition by the 1st of March last, to which the judges have awarded the prizes offered by the Society; namely:—

To THOMAS ROWLANDSON, of Liverpool, the Prize of Fifty Sovereigns for the best Report on the Farming of North Wales.

To SAMUEL JONAS, of Ickleton, Cambridgeshire, the Prize of Fifty Sovereigns for the best Report on the Farming of Cambridgeshire.

To JOHN BRAVENDER, of Cirencester, the Prize of Fifty Sovereigns for the best Report on the Advantages or Disadvantages of Breaking up Grass-land.

To GEORGE NICHOLLS, of Hyde Park-street, London, the Prize of Thirty Sovereigns for the best Essay on the Improvement of the Condition of the Agricultural Labourer so far as it may be promoted by private exertion without legislative enactment.

To HUGH RAYNBIRD, of Hengrave, Suffolk, the Prize of Twenty Sovereigns for the best Account of Measure-Work, locally known as Task, Piece, Job, or Grate work, in its application to agricultural labour.

To W. C. SPOONER, of Southampton, the Prize of Ten Sovereigns for the best account of the use of Superphosphate of Lime produced with acid and boxes for manure.

To T. C. BURROUGHS, of Gazeley, Cambridgeshire, the Prize of Ten Sovereigns for the best Account of the Cultivation of White Mustard.

To W. LINTON, of Sheriff Hutton, Yorkshire, the Prize of Ten Sovereigns for a description of the best method of Draining Running Sands.

“The judges on the 16 Essays on the Keeping of Farming Accounts, having reported that none of the Essays are worthy of the Prize offered by the Society in that class, the Council have appointed a Committee to report on the best mode in their opinion in which a practical farmer may be enabled in the simplest manner to keep the requisite accounts connected with his farming establishment. The Council are indebted to the kindness of Mr. John Clarke, of Long Sutton, Lincolnshire, in having placed at the disposal of the Journal Committee his Essay on Grass Lands, commended by the judges.

“The Council have adopted the following schedule of subjects and amount of prizes for the Reports and Essays of next year, subject to such conditions as will hereafter, in due time, be published:—

On the Farming of Northumberland	£50
On the Farming of Suffolk	50
On the Farming of Somersetshire	20
On the Management of Sheep	20
On the Cultivation of Wheat	20
On the Cultivation of Mangold Wurzel	20
On Paring and Burning	10
On Flax	20
On the Great Level of the Fens, history of the drainage, view of its present state, and account of the defects which still require to be remedied	50
For an account of the best Manure for Wheat compounded of chemical ingredients, to be tried by Judges appointed by the Society	30
For an account of the best Manure for Turnips, compounded of chemical ingredients, to be tried by Judges appointed by the Society	30

“The Council have adopted the following regulations in reference to any question of disputed patent-right that may be made by exhibitors of such implements as may be selected by the Judges for trial, namely:—
 ‘That the Stewards of the Yard, on receiving a notice in writing that any invention is considered to be an infringement of the right of another party, shall be directed to inform the exhibitor that he will be at liberty to direct the trial, under the inspection of the Judges; and if, on such trial, his invention should be found to merit the prize, the prize shall be awarded, subject to the condition of payment being suspended for a reasonable period, to allow the trial of the rights of the parties at law; and that if no steps at law are taken in the next term, the award shall be absolute.’”

“The Council, judging from the entry of stock and implements already made, have every reason to anticipate an extremely good meeting at Newcastle; and, in conclusion, have not only to report the continual accession of new Members from every part of the kingdom, but to congratulate the Society on the steady progress made in the gradual development of its established principles, and in the attainment of a more exact knowledge, derived from experience of the means best adapted to ensure their advancement. The Council rely with confidence on the continued support and co-operation of all the Members of the Society, and trust they will thereby secure the prosperity of this great national institution.

(Signed) “By order of the Council,
 JAMES HUDSON, Secretary.”

The President took that opportunity of taking a review of the proceedings of the Council during the past half year, and concluded by expressing his confident hope that the Society would eventually attain a steady amount of from 8,000 to 10,000 members on its list, and reminding the Meeting that the Society was established for the promotion of practical agriculture, aided by that science which is gained by experience.

On the motion of Sir Richard Jodrell, Bart., seconded by the Hon. H. W. Wilson, the Report was then unanimously adopted by the meeting.

Colonel Austen, M.P., Chairman of the Finance Committee, having read to the Meeting the Auditors' Balance-sheet and recommendations, and the Balance-sheet of the Shrewsbury Meeting, on the motion of Viscount Torrington, seconded by E. A. Sanford, Esq.,

the thanks of the Meeting were voted to Charles Tawney, Esq., C. Hampden Turner, Esq., and Thomas Knight, Esq., the auditors of accounts on the part of the Society.

On the motion of Richard Milward, Esq., of Thurgarton Priory, seconded by John Kinder, Esq., Sandridgebury, the thanks of the Meeting were voted to the Railway Companies, for their liberal concessions in favour of the Exhibitors of the Society.

On the motion of the Earl of Ducie, seconded by Peter Pole, Esq., of Drayton Hall, the best thanks of the Meeting were voted by acclamation to the Right Hon. Lord Portman, the president, for the invaluable services he had already rendered to the Society by his devoted attention to its interests.

The Meeting then broke up.

NEW MEMBERS.

Viscount Newry and Morne, of Morne Parke, Co. Down, Ireland, and Eaton Place, Belgrave Square, London, was elected a Governor, and the following gentlemen members of the Society:—

Aichison, William, Hazelridge, Belford, Northumberland
Anderson, Robert, Grey-street, Newcastle-upon-Tyne
Anderson, Robert, Weston, Gateshead, Durham
Arrowsmith, W. L., Island of Malta
Bagot, Lord, Blithfield, Rugeley, Staffordshire
Bell, Richard Hansell, Deckham Hall, Gateshead, Durham
Barkus, William, Eighton Lodge, Gateshead, Durham
Bates, Edward, Snipe House, Alnwick, Northumberland
Besely, Rev. Dr., Vicarage House, Longbenton, Newcastle-upon-Tyne
Blayds, John, Oulton Hall, Leeds
Boulay, Rev. Francis Wm., Rector of Lawhitton, Launceston
Brewer, John, 8, Upper Bedford-place, London
Bryan, Frederick Thomas, Knossington, Oakham, Rutland
Bullock, Benjamin, Spittle Hill, Morpeth, Northumberland
Burrell, William, Broome Park, Alnwick, Northumberland
Burrell, Bryan, Bolton House, Alnwick, Northumberland
Butler, Thomas, Walwick, Hexham, Northumberland
Champneys, Rev. P., Hunton, Maidstone, Kent
Charleton, Charles Forster, Alndike, Alnwick, Northumberland
Chrisp, James, Newcastle-upon-Tyne
Colbeck, Henry, Low-Weetslid Farm, Benton, Newcastle-upon-Tyne
Colquhoun, J. C., M.P., 8, Chesham-street, Belgrave-square, London
Crallan, Thomas, Bolesworth Castle, Tattenhall, Cheshire
Crawford, William, Newton-Purcell, Bicester, Oxon
Dew, Tomkins, Whitney Court, Hereford
Dixon, Dixon, Unthank Hall, Haltwhistle, Northumberland
Domville, Rev. William, Winforton, Hereford
Donkin, Armorer, Jesmond, Newcastle-upon-Tyne
Downes, William Henry, New House, Much-Wenlock, Salop
Drewry, George, Holker-house, Cartmell, Lancashire
Dunn, Mathias Wm., Hedgefield, Newcastle-upon-Tyne
Dunn, George, Newcastle-upon-Tyne
Dunbar, Hon. Robert, Millfield Hill, Wooller, Northumberland
Dutton, T., Villa-Real, Hylton Grove, Newcastle-upon-Tyne
Easton, James, Nest House, Gateshead, Durham
Eastwood Richard, Brimshaw, Burnley, Lancashire
Elliott, Eustace, Smeaton-Pilatton, Landulph, Cornwall

Finlay, James, Summer Hill, Newcastle-upon-Tyne
Frost, Saml. Merryne, jun., Bullocksteads, Newcastle-upon-Tyne
Forster, Geo. Carnaby, White House, Gateshead
Gibson Wm., Northumberland-street, Newcastle-upon-Tyne
Grace, Edward Nathaniel, Byker Hill, Newcastle-upon-Tyne
Grace, Edward, Walls' End, Newcastle-upon-Tyne
Granville, Earl, Aldenham, Bridgenorth, Salop
Greville, Algernon, North Lodge, Potter's Bar, Herts
Harding, Richard, Warren Farm, Finncr, Buckingham
Hippesley, John, Stone-Easton, Wells, Somerset
Hobson, Dr., Park House, Leeds, Yorkshire
Horlock, Frederick, Guestling Lodge, Hastings, Sussex
Hunter, William, Loroine Place, Newcastle-upon-Tyne
Ingham, Robert, Weston, South Shields, Durham
Jackson, John Somerville, Eastham, Chester
James, Robert, Chalkside, Wigton, Cumberland
James, John, Pilgrim-street, Newcastle-upon-Tyne
Kirk, Richard, Gale Bank, Layboun, Wensleydale, Yorkshire
Lawes, John Bennett, Rothampsted Park, Harpenden, Herts
Loraine, Edward, Crocaddon, Callington, Cornwall
Loraine, John Lambton, Newcastle-upon-Tyne
Lowndes, Robert, Tattenhall, Chester
Malcolm, Colonel George, Warfield, Bracknell, Berks
March, John, Greenside, Newcastle-upon-Tyne
Mellor, James, Hunter-street, Liverpool
Mercer, James, M.D., 50, Northumberland-street, Edinburgh
Nairn, Henry, Newcastle-upon-Tyne
Newry, Viscount, 63, Eaton-place, Pimlico
Nutt, John W., York
Palmer, John, Stockton-on-Tees, Durham
Patterson, John, Holbeck, Ulverstone, Lancashire
Preston, Henry, Moreby Hall, York
Riddell, Sir Walter Buchanan, Bart., Old Square, Lincoln's Inn
Robinson, Joseph, Tanfield, Chester-le-Street, Durham
Roods, William, Littleington, Lewes, Sussex
Rowlandson, Thomas, 59, St. Ann's-street, Liverpool
Russell, Sir Robert Frankland, Bart., 15, Cavendish-square, London
Russell, George Greenwell, Willington, Northumberland
Selby, Charles, Earle, Wooller, Northumberland
Selby, Leopold, Pelton College, Chester-le-Street, Durham
Shafto, Rev. John Dumeombe, Brancepeth Rectory, Durham
Smith, William, Longbenton, Newcastle-upon-Tyne
Smith, Henry, Maid's-Moreton Lodge, Buckingham
Smith, Timothy, Hoyland Hall, Sheffield, Yorkshire
Smith, H., Stamford, Lincolnshire
Smith, Alexander, Gallate House, Norham, Berwick-on-Tweed
Stable, George Waugh, Newcastle-upon-Tyne
Stevens, Alfred, Tongham Manor, Farnham, Surrey
Stevens, John, Oxford
Straker, John, Eldon Square, Newcastle-upon-Tyne
Stretton, Alexander, Adbolton, Nottingham
Stubbs, Frederick, Wetmoor, Ludlow, Salop
Sowerby, Thomas, Saltwell-vale, Gateshead, Durham
Tallant John, Little Houghton Lodge, Northampton
Tawney, A. R., Banbury, Oxfordshire
Thomas, John, jun., Ynissiwid, Neath, Glamorganshire
Thorold, Richard, Welshy Hall, Grimspy, Lincolnshire
Tucker, Henry, Coleraine House, Stamford-hill, Middlesex
Unett, J. W., Smethwick, Birmingham
Walters, Robert, Charlotte-square, Newcastle-upon-Tyne
Ward, William Squire, Wellow Hall, Ollerton, Notts
Whittle, Edward, Toller-Fraturm, Dorchester, Dorset
Williams, Hugh, Kineton, Warwickshire
Wilson, Joseph, Crackenthorpe Hall, Appleby, Westmoreland
Wright, William, Gresford Bank, Chester.

LETTERS ON SCOTCH BANKING AND CURRENCY.

LETTER III.

"The kettle o' our Banking lads,
If e'er a claut sud fail in't,
The de'il a Savon tinkler loon
Shall ever ca' a nail in't.
Our father's blude the kettle bought,
And wha wad dare to spoil it,
By heaven, the sacrilegious dog
Shall fuel be to boil it."

MR. EDITOR,—I shall now proceed to show, in a few words, that *Justice to England and to the Bank of England!* is, without going about the bush, gross, unadulterated humbug; and shall farther endeavour to show that the other standing argument—that, in case of emergency, as the occurrence of famine, and the providing for foreign subsidies, to be prepared with a reserve of gold, we must have a gold circulating medium—is equally gross, unadulterated humbug.

For a century and a half has Scotland managed her paper currency so admirably as to excite the admiration and compel the wonder of friend and foe. I have shown that the paper currency is amply secured and guarded, that over-issue is impossible; and I now state what is equally well known—that her bank paper is convertible into bullion at the pleasure of the holder. A million and upwards in gold, Bank of England notes, and Exchequer bills, &c., is kept in constant reserve for this and similar purposes of safety. By this arrangement half a million at least—and who will venture to deny, positively, that an amount more nearly approaching a million—is saved to the country; and this, in the computed probable loss in coinage, tear and wear, shipwreck, fire, expense of transport, and other accidents, inconveniences, and charges which are inseparable from the employment of a metallic currency. Besides, as we stand at present, the three million sterling represented by our paper currency is set free, to be employed in profitable investments. Our cash credit system, and the allowance of interest on deposits, I may speak of hereafter. But it is undeniable that it has been under our present banking system, with our paper currency, our cash credits, and the allowance of interest on deposits, that Scotland has made such prodigious advances in agriculture, manufactures, and trade, as to command the admiration of the world. But *Justice to England!* is the cry. How has England lost anything by our employing a paper currency of three millions, which has saved the nation the expense of coinage, tear and wear, &c., on that account? How has England lost anything by the increasing capital and the accumulation of wealth and substance which have enabled Scotland, year by year, to enlarge her trade with her sister of England? How could the

growing trade with England have been benefited by the withdrawal of three millions of Scotch capital, to be invested in the purchase of gold to supply a new circulating medium? Scotland would thus have been *competing with England* in the bullion market. Is it not evident, besides, that the trade of Scotland with England must have been proportionally circumscribed? Would this have been *justice to England?*

But the Bank of England, we are told, has to retain in her coffers seven millions or eight millions, to meet the possible demands of foreign exchanges; and this is a mighty hardship inflicted on her! Does she not receive ample compensation for this hardship? She receives as part compensation fourteen or fifteen millions of deposits, for which *she pays no interest*, and of which Scotland contributes her full share! Is this any hardship? She has to keep the one-half of this amount in bullion. Is this any mighty hardship? She is permitted to issue her notes free of stamp duty, paying a trifling sum by way of compromise. Is this any hardship? She receives a very large annual payment from the Government for the management of the national debt. Is this any hardship? Now, of all these advantages conferred on the Bank of England, Scotland contributes her full share. Does Scotland complain of so doing as any hardship? Then, in face of these truths, in the name of justice, what man of common honesty will presume to raise the cry of *Justice to the Bank of England!* Does not Scotland render her ample justice? Then why should England, or the Bank of England, show any disposition to be unjust to Scotland? Scotland, from her employing a paper currency, not only saves the nation the expenses of coinage and wear and tear, &c., attendant on, and inseparable from, three millions sterling of a gold currency; but the expense of the *English* gold currency is borne not by England *alone*, but by the *nation*; and of this national expense *Scotland* bears her full share. *Is this not rendering ample justice to England and the Bank of England?*

My words have been few. But is it not plain that the cry of *Justice to England and to the Bank of England!* is, without going about the bush, gross, unadulterated humbug?

Our persecutors would *ruin* Scotland, without being able to plead the *very unfair* excuse even of *benefiting* England at her expense. On the contrary, I have distinctly shown above, that by the discouragement of a growing trade, and the profitable interchange of commodities, they would, by their hair-brained nonsense, inflict an incalculable injury on the sister country, as well as on Scotland.

But I have another great argument of theirs still to deal with. In case, say they, of the occurrence of

cases of emergency, as famine, and the providing for foreign subsidies—as during the war—to be prepared with a reserve of gold, we must have a gold circulating currency.

Well, suppose our Scotch notes abolished, and gold substituted in their stead, as the common currency of Scotland. An emergency occurs—a famine. Gold must be exported, we shall say, for three millions' worth of food. Answer me, is it possible to withdraw the circulating coin of the country on a sudden, to collect it from head banks and branch banks, the castle, the cottage, the shop-till; to demand the unreserved and immediate revelation and production of every tea-pot and stocking-heel, charged with coin, and secured with palpitating eagerness, by every furtive miser in "braid Scotland," in order that this hoarded aggregate treasure may be sent to some foreign country to purchase three millions' worth of grain? Is it not plain that this would put an end to buying and selling in Scotland? For the circulating medium will be withdrawn; and who could purchase without money? This is all very absurd, no doubt. Then what better could we be of a gold currency in case of famine, or the necessity of providing for foreign subsidies? Would not any sudden demand equally derange the currency, whatever it might be composed of? Does this not hold equally true in the case of famine or of foreign subsidies?

I could tell what would prevent our suffering from some of these supposable emergencies; but most assuredly the existence of a gold circulating currency in Scotland can never prevent it.

In my next I shall proceed to show the loss that will accrue to Scotland from any vile tampering with her banking or currency.

I have heard of the proceedings of some vile traitors in Scotland's cause, and of their *secret* traffickings in high quarters, as they, no doubt, thought them secret. I say to them *beware*, or exposure is certain.

For the present, I am, &c.,

OBITER DICTUM.

LETTER IV.

"So proud, I am no slave;

So impudent, I own myself no knave;

So odd, my country's ruin makes me grave."—POPE.

MR. EDITOR,—Before proceeding to show the loss which must accrue to Scotland from any attempt against her system of banking or currency, I shall add a few words respecting defective harvests, and procuring grain from foreign countries.

The truth is, that when a defective harvest occurs, the Scotch merchant like the English merchant—for both merchants, be it observed, proceed precisely in the same manner—sends his order for a cargo or cargoes of grain to the foreign merchant; the foreign merchant, who pays for the grain in the currency of his own country, draws bills in London for price, profit, and charges; and the Scotch merchant provides for these bills when due through his Scotch banker, who

has always ample available funds lying in the hands of his correspondent in London.

No doubt, if very many cargoes are simultaneously purchased, and a corresponding number of bills are thrown upon the market at the same moment, the exchanges will be unfavourably affected; but this state of things is anticipated, provided for, and speedily rectified by dealers in money and brokers, who study the fluctuations of exchanges, and who, by remitting directly through a favourable channel, and by prompt shipments of gold where required, speedily restore the par of exchange between one point and another. *These fluctuations of exchanges would occur as certainly and unavoidably with a metallic, as with a mixed or simple paper currency.* No part of the existing currency, or whatever it be composed, can at any time be withdrawn on an emergency, for exportation. The supply for export must be drawn from the reserved capital of the bankers—not in any case from the circulating currency; and this reserved capital they must be provided with, whether the circulating currency be paper or gold.

But it may be asked still more particularly, whence is this gold for shipment derived? I admit that it will be chiefly obtained by presenting the promissory notes of the Bank of England—her own promissory notes, remember—and demanding gold for the amount. But the Bank of England, like other dealers in money, and brokers in bills, should be able to anticipate such emergencies, though she cannot prevent them, and provide against the consequences. Is not this her especial business? Should the Bank of England grumble at being called upon to pay in cash *her own notes*? What is the understanding between this National Bank and the Government? The Bank of England enjoys certain privileges which we have already glanced at; and in return, that Bank—besides performing other public services, sufficiently light compared with the remuneration—becomes bound to pay in gold *her own notes when demanded*. Is this a mighty hardship?

Let us see whether this public arrangement has not all along been most unprofitable to the Bank of England, even during the period from 1809 to 1830, both inclusive, when commissions of bankruptcy against country bankers of England were issued to the number stated in the following table:—

Years.	Commissions.	Years.	Commissions.
1809	4	1820	4
1810	20	1821	10
1811	4	1822	9
1812	17	1823	9
1813	8	1824	10
1814	27	1825	37
1815	25	1826	43
1816	37	1827	8
1817	3	1828	3
1818	3	1829	3
1819	13	1830	14

Exclusive of the above, many banks stopped payments, to the great injury of the creditors and the public, that afterwards resumed them, at the same time that the affairs of some bankrupt concerns were arranged without a commission.

DURING THE WHOLE OF THIS PERIOD NOT A SINGLE SCOTCH BANK GAVE WAY. How can any English statesman have the effrontery to condemn Scotch banking and currency after this triumphant practical vindication of its stability and excellence? To our Saxon persecutors we would say, with Gay:—

“ Ere you remark another's sin,
Bid thy own conscience look within;
Control thy more voracious bill,
Nor for a breakfast nations kill.”

The following is an account of all distributions made by the Bank of England amongst the proprietors of bank stock, whether by money payments, transfer of 5 per cent. annuities, or otherwise, under the heads of bonus, increase of dividends, and increase of capital, betwixt the 25th February, 1797, and 31st March, 1832, in addition to the ordinary annual dividend of 7 per cent. on the capital stock of that corporation existing in 1797, including therein the whole dividend paid since June, 1810, on the increased capital; stating the period when such distributions were made, and the aggregate amount of the whole.

Denomination and periods of distribution.

	Amount.
In June, 1799—£10 per cent. bonus, in 5 per cents.	
1797, on £11,642,400, is ...	£1,164,240
May, 1801—£5 per cent. ditto, in navy 5 per cents., ditto ...	582,120
Nov., 1802—£2 10s. per cent., do., do., do. ...	291,060
Oct., 1804—£5 per cent. do., cash, do. ...	582,120
Oct., 1805—£5 per cent. do., do., do. ...	582,120
Oct., 1806—£5 per cent. do., do., do. ...	582,120
From April, 1807, to Oct., 1822, both inclusive. { Increase of dividends at the rate of £3 per cent. per annum on £11,642,400 is, 16 years ...	5,588,352
From April, 1823, to Oct., 1829, both inclusive. { Increase of dividends at the rate of £1 per cent. per annum on £11,642,400, is, 7 years ...	814,968
In June, 1816. { Increase of capital at 25 per cent., is ...	2,910,600
From Oct., 1816, to Oct., 1822, both inclusive. { Dividend at the rate of £10 per cent. per annum on £2,910,600, increased capital is, 6½ years ...	1,891,890
From April, 1823, to Oct., 1831, both inclusive. { Dividend at the rate of £8 per cent. per annum on £2,910,600 increased capital, is, 9 years ...	2,095,632

Aggregate amount of the whole ... 17,318,070

Annual dividend payable on bank stock in 1797, on a capital of £11,642,000, at the rate of £8 per cent. per annum ... 814,986

Annual dividend payable since June, 1816, on a capital of £14,553,000, to October, 1822, inclusive, at the rate of £10 per cent. per annum ... 1,455,300

Annual dividend payable from April, 1823 to 31st March, 1832, both inclusive, on a capital of £14,533,000, at the rate of £8 per cent. per annum ... 1,164,240

WILLIAM SMEE, Dept. Acct.

Bank of England, June 27, 1832.

Now, I request particular attention to this official account of distributions during a long period and embracing the period to which I have above alluded. Let it be compared with the above disgraceful list of Eng-

lish bankruptcies, evidencing such wholesale swindling, and involving such wide-spread havoc and general distress. Does it not appear that the privileges accorded by the British public to the Bank of England have enabled her to accumulate wealth in the most calamitous times? Surely, then, she should not grumble at being asked by that generous public to exchange gold for her own promissory notes on demand. When, as Swift says—

“ Many a wretch in Bedlam,
Though perhaps among the rout
He wildly flings his filth about,
Still has gratitude and sapience
To spare the folk that give them ha'pence.”

It is only in emergencies that the conversion is required to any inconvenient extent. It is only the occurrence of such emergencies that enable her to prove that the perpetuation of her monopoly is really, in any respect, a national benefit. She should rejoice in such an opportunity of proving her usefulness in these levelling times, when all monopolies are at a discount in popular estimation. And let her remember, as well as our remorseless statesmen persecutors, that during the whole of the period from 1809 to 1830, both inclusive, when the above disgraceful number of commissions were issued against English bankers, besides many others who stopped payments and resumed them, and some bankrupt concerns which were managed without a commission, thus deranging the currency of the country to an unheard-of extent, involving the man of honour and the knave in one common ruin, NOT A SINGLE SCOTCH BANK GAVE WAY.

Does this plain statement furnish any reasonable argument for assailing our sound and stable Scottish banking system and currency, which has stood the test of a century and a half, including periods of panic and famine, internal rebellion and foreign war? Ye theorists of England, how can you deny facts patent to the whole world? In mercy spare our last monuments of fame and strength, and leave us not to moralize over their ruins, in words like those of Milton's—

“ And here let those who boast in mortal things,
Learn how their greatest monuments of fame,
And strength, and art, are easily outdone
By reprobate spirits.”

Meantime, I am, &c., OBITER DICTUM.

LETTER V.

“ Destruction hangs o'er yon devoted wall,
And nodding Iliou waits the impending fall.”

Pope.

“ May no such storms
Fall on our times, where RUIN must reform.”

Sir John Denham.

SIR,—If our paper currency is condemned, cash credits and allowance of interest on deposits must be done away with. A masterly exposition and defence of these systems are embodied in the report of the Lords in 1826, when they were formerly assailed with such impotent rashness.

With respect to Scotland, said their lordships, it is to be remarked, that during the period from 1766 to 1797, when no

small notes were by law issuable in England, the portion of the currency in Scotland in which payments under five pounds were made, continued to consist almost entirely of £1 and £1 1s. notes, and that no inconvenience is known to have resulted from difference in the currency of the two countries. This circumstance, amongst others, tends to prove that uniformity, however desirable, is not indispensably necessary. It is also proved, by the evidence and by the documents, that the banks of Scotland, whether chartered or joint stock companies or private establishments, have, for *more than a century*, exhibited a stability which this committee believe to be *unexampled in the history of banking*; that they supported themselves from 1797 to 1812, without any protection from the restriction by which the Bank of England and that of Ireland were relieved from cash payments; that there was little demand for gold during the late embarrassments in the circulation; and that, in the *whole period* of their establishment, there are not more than *two or three* instances of bankruptcy. As, during the whole of this period, a large proportion of their issue consisted almost entirely of notes not exceeding £1, or £1 1s., there is the strongest reason for concluding, that, as far as respects the *banks of Scotland*, the issue of paper of that description has been found *compatible with the highest degree of solidity*; and that there is not, therefore, *while they are conducted on their present system*, sufficient ground for proposing any alteration, with the view of adding to a solidity which has been so long *sufficiently established*.

This solidity appears to derive a great support from the constant exchange of notes between the different banks, by which they become checks on each other, and by which any over issue is subject to immediate observation and correction.

There is also one part of the system, which is stated by all the witnesses (in the opinion of the committee very justly stated) to have had the best effects upon the people of Scotland, and particularly upon the middling and poorer classes of society, in producing and encouraging *habits of frugality and industry*. The practice referred to is that of **CASH CREDITS**. Any person who applies to a bank for a cash credit is called upon to produce two or more competent securities, who are jointly bound, and after a full inquiry into the character of the applicant, the nature of his business, and the sufficiency of his securities, he is allowed to open a credit, and to draw upon the bank for the whole of its amount, or for such part as his daily transactions may require. To the credit of this account, he pays in such sums as he may not have occasion to use, and interest is charged or credited on the daily balance, as the case may be. From the facility which these cash credits give to all the small transactions of the country, and from the opportunities which they afford to persons who begin the world with little or no capital but their character, to employ profitably the minutest products of their industry, it cannot be doubted that the most important advantages are derived to the whole community. The advantage to the banks who give those credits arises from the call which they continually produce for the issue of their paper, and for the opportunity which they afford for the profitable employment of part of their deposits. The banks are indeed too sensible that, in order to make this part of their business advantageous and secure, it is necessary that their cash credits should (as they express it), be frequently operated upon, that they refuse to continue them unless this implied condition be fulfilled. The total amount of their cash credits is stated by one witness to be five millions, on which the average amount advanced by the banks may be one-third.

The manner in which the practice of *deposits on receipts* is conducted tends to produce the same desirable results. Sums to as low an amount as £10 (and in some instances lower) are

taken by the banks from the depositor, who may claim them at demand. He receives an interest, usually about one per cent., below the market rate. It is stated that these deposits are, to a great extent, left uncalled for from year to year, and that the depositors are in the habit of adding, at the end of each year, to the interest then accrued, the amount of their yearly savings; that the sums thus gradually accumulated belong chiefly to the labouring and industrious classes of the community; and that, when such accounts are closed, it is generally for the purpose of enabling the depositors either to purchase a house, or to engage in business.

It is contended by all the persons engaged in banking in Scotland, that the issue of £1 notes is essential to the continuance both of their cash credits and of the branch banks established by the poorest and most remote districts. Whether the discontinuance of £1 notes would necessarily operate to the full extent which they apprehend, in either of these respects, might perhaps admit of doubt; but the *apprehensions* entertained on this head, by the persons most immediately concerned, might, for a time at least, have the same effect as the *actual necessity*; and there is strong reasons to believe, that if the prohibition of £1 notes would not *ultimately* overthrow the whole system, it must for a considerable time *materially affect it*.

The directors of the Bank of England, who have been examined before the committee, have given as their opinion that a circulation of £1 notes in Scotland or Ireland would *not produce any effects injurious to the metallic circulation of England*, provided such notes be respectively confined within the boundary of their own country.

Notwithstanding the opinions which have been here detailed, the committee are, on the whole, so deeply impressed with the importance of a metallic circulation below £5 to England, not only for the benefit of England, but likewise for that of all other parts of the empire, that if they were reduced to make an option between the establishment of such a metallic circulation in Scotland, or the abandonment of it in England they would recommend the prohibition of small notes in Scotland. But they entertain a reasonable expectation, that legislative measures may be devised which will be effectual in rendering the introduction of Scotch paper into England *ineffectual in practice*; and *unless some new circumstance* should arise to *derange the existing system in Scotland itself*; or materially to affect the relations of trade and intercourse between Scotland and England, they are not disposed to recommend that the existing system of banking and currency in Scotland should be disturbed.

Now everybody knows that a Scotch note never crosses the Border *in practice*, and that *no new circumstance has arisen* to derange our system of banking in Scotland. In the name of common honesty, then, why is this impudent attack made upon us? The prohibition of those credits alone would ruin Scotland. When the former attempt was made against our banking system, what was the consequence? The banks resolved on refusing any new applications for cash credits, and on withdrawing those in existence with as little delay as circumstances would permit of. The proprietor of land had to stop in the middle of his progressive, though incomplete, and therefore valueless improvements; the merchant, who depended on his bank cash credit for the prosecution of his business, saw nothing before him but inevitable and irretrievable ruin and destruction; the manufacturer had to sacrifice his large invested capital in building and machinery, and the

thousands he employed were turned out of doors to rob, to murder, to burn, and to starve.

And would this not certainly recur again with the revival of the former provocative cause? The former attempt against our national prosperity was as formidable as the present;—but it failed. If Ministers proceed to advocate and carry into practice this sweeping change, they have been sufficiently warned of the danger, and they will have their own obstinate rashness alone to blame for the consequences. SCOTLAND, as regards old recollections and bitter memories, IS NOT DEAD, BUT SLEEPETH. Is it not fool hardy to shake her thus rudely awake?

It is evident that the Lords, in 1826, thought so, and what did the committee of the commons then say on the subject?

Upon a review of the evidence tendered your committee (say the Commons), and forming their judgment upon that evidence, your committee cannot advise that a law should be now passed, prohibiting from a period to be therein determined, the future issue in Scotland of notes below £5.

There are, in the opinion of your committee, sufficient grounds in the experience of the past for permitting another trial to be made of the compatibility of a paper circulation in Scotland with a circulation of specie in this country.

Looking at the amount of notes current in Scotland below the value of £5, and comparing it with the total amount of the paper currency of the country, it is very difficult to foresee the consequences of a law which should prohibit the future issue of notes constituting so large a proportion of the whole circulation.

Your committee are certainly not convinced that it would affect the cash credits to the extent apprehended by some of the witnesses; but they are unwilling, without stronger proof of necessity, to incur the risk of deranging from any cause whatever, a system admirably calculated, in their opinion, to economise the use of capital, to excite and cherish a spirit of useful enterprise, and even to promote the moral habits of the people, by the direct inducements which it holds out to the maintenance of a character for industry, integrity, and prudence.

“At the same time that your committee recommend that the system of currency which has for so long a period prevailed in Scotland, should not, under existing circumstances, be disturbed, they feel it to be their duty to add, they have formed a judgment upon a reference to the past, and upon the review of a state of things which may hereafter be considerably varied by the increasing wealth and commerce of Scotland, by the rapid extension of her commercial intercourse with England, and by the new circumstances that may affect that intercourse after the re-establishment of a metallic currency in this country.

“Apart from these general observations, bearing upon the conclusions at which they have arrived, there are two circumstances to which your committee must more particularly advert.

“It is evident that if the small notes issued in Scotland should be current beyond the border, they would have the effect, in the proportion as their circulation should extend itself, of displacing the specie, and even in some degree the local currency, of England. Such an interference with the system established for England would be a manifest and gross injustice to the banker of this part of the empire. If it should take place, and it should be found impossible to frame a law consistent with a sound and just principle of legislation, effectually restricting the circulation of Scotch notes within the limits of Scotland, there will be, in the opinion of your committee, no

alternative but the extension to Scotland of the principle which the Legislature has determined to apply to this country.

“The other circumstances to which your committee meant to refer, as bearing materially upon their present decision, will arise in the event of a considerable increase in the crime of forgery. Your committee called for returns of the number of prosecutions and convictions for forgery and the offence of passing forged notes, during the last twenty years, in Scotland, which returns will be found in the appendix. There appear, during that period, to have been no prosecutions for the crime of forgery, to have been eighty-six prosecutions for the offence of issuing forged promissory notes; fifty-two convictions, and eight instances in which capital sentence of the law has been carried into effect.”

As we have already stated, *not a single Scotch note ever crosses the Border*, and there appear to have been, during twenty years, no prosecutions for the crime of forgery.

Thus spoke the Lords and Commons of 1826. Are the Lords and Commons of the present day wiser in their generation? Whatever they may think, if they persist, they will soon know what the people of Scotland think. Scotch courage and Hibernian hate will come pouring on with irresistible volume; and we shall be the first to cry, AGITATE! AGITATE! AGITATE! The majority of ninety-five will vanish like a dream; and our leading persecutor will be told that, although his family fortune was doubled by the currency revolution of 1819 and subsequent events, yet Scotland will not submit to be bled when she little requires it, even although it should be the means of curing his financial monomania, or that of his bachelor knights-errant.

Mr. Gilbert, in his “Practical Observations on Banking,” remarks that, “were the English banks, like the Scotch banks, to receive deposits of £10 and upwards, and allow interest upon them at one per cent. less than the market rate, they would confer an immense advantage on the community, and open a source of profit to themselves. This is, in fact, a part of the proper business of a bank. A banker is a dealer in capital, an intermediate party between the borrower and the lender. He borrows of one party, and lends to another; and the difference between the terms at which he borrows and those at which he lends is the source of his profit. By this means he draws into active operation those small sums of money which were previously unproductive in the hands of private individuals, and at the same time furnishes accommodation to another class, who have occasion for additional capital for carrying on their commercial transactions.

In further corroboration, Mr. J. G. Gibson Craig stated before the Lords’ committee, in 1826, that the deposits with Scotch banks at that period amounted to about £24,000,000, of which more than a half consisted of sums from £10 to £200. Mr. McCulloch considers this a convincing proof of the importance of the system, and thinks that perhaps it is not going too far to affirm that, but for the receiving of deposits by the banks, and the allowing of interest upon them, not one-third of the sums under £200, and not one-

half of those above it, would ever have been accumulated.

A well-informed witness being questioned before the committee, and asked, "What class of the community is it that makes the smallest deposits?" answered, "They are generally the labouring classes in a town like Glasgow; in country places, like Perth and Aberdeen, it is from servants and fishermen, and that class of the community who save small sums from their earnings till they came to be a bank deposit. There is now a facility for their placing money in the provident banks, which receive money till the deposit amounts to £10. When it comes to £10, it is equal to the minimum of a bank deposit. The system of banking in Scotland is an extension of the provident bank system. Half-yearly or yearly those deposits come to the bank, and add the savings of their labour, with the interest that has accrued upon the deposits from the previous half-year or year, to the principal; and in this way it goes on, without being at all reduced, accumulating (at compound interest) till the depositor is able either to buy or build a house, when it comes to be £100 or £200 or £300, or till he is able to commence business as a master in the line in which he has hitherto been a servant. A great part of the depositors of the bank are of this description, and a great part of the most thriving of our farmers and manufacturers have arisen from such beginnings."

Now, how could the Scotch banks possibly continue the incalculable advantage of cash credits and interest on deposits, without the profit arising from their £1 notes? I apprehend that this would be impossible, without imposing a heavy charge, if it should not prove a prohibitory one.

The cash credits are taken at £7,000,000 sterling, the small notes circulation at £2,250,000, and to supply the amount necessary to be *in transitu* to and from the head offices, for a constant interchange, would be kept up to prevent unnecessary accumulation at any one point, we might fix on double that amount, to afford the same accommodation as at present. This would give £4,500,000 as the necessary amount of gold to be provided, or bought in by the Scotch banks.

The profit of the Scotch banks, on a circulation of £2,250,000 of small notes, at £1, has hitherto amounted to, at 3 per cent.	£ 67,500
With a gold circulation, this profit would be entirely lost. We must add to this loss the cost of £4,500,000 worth of gold, which, had it been applied to some lucrative investment (instead of being merely used as a measure of exchange), when it would have added to the active capital of the country, encouraging and promoting its prosperity, or even invested in 3 per cent. stock, would yield.....	135,000
Add charge for insurance, freight, carriage, tear and wear, counterfeits, &c., 1 per cent.....	45,000
Together.....	£247,500
From this deduct interest to be charged on £2,250,000 gold advanced as above, at 3 per cent.	67,500
Leaving a loss, to be made up to the banking companies of Scotland, of.....	£180,000

Now, to make up for this amount of loss—viz., £180,000, as stated above—the banks would require to exact a charge of more than 2½ per cent. on cash credits; that is to say, that the charge on every cash account of £1,000 would require to be (so as to indemnify the banks for the loss of profit on the £1 note circulation, and the substitution of a gold currency) at least £25 sterling, which, in fact, would come short considerably of a full indemnification. How this will be relished, it is not difficult to tell. It will involve hundreds and thousands in misery and ruin. But we have not done yet. There are many other losses and inconveniences that must follow on any tampering with our banking or currency.

The substitution of a gold for a paper currency, then, would appear to involve, in the department of cash credits alone, a loss to the banks—and, through them, directly to the public—of ...	£ 180,000
But the deposits of the Scottish public with the various Scotch banks is stated correctly at the sum of £30,000,000 sterling, on which the banks, from various other inconveniences, risks, and heavy charges attendant on this change, and which we cannot pause to specify, will not be able to afford interest; and this, at 2 per cent., would produce	600,000
Together.....	£780,000

Is it not clear, then, that by the expensive arrangement of an introduction of a gold currency into Scotland, the industrious classes would be defrauded and pillaged to the extent perhaps of £780,000 per annum? What a woful revolution would this produce in the character of the working classes of Scotland! How effectually would it check habits of industry, economy, and thrift! And does the Minister suppose that the people of Scotland are to submit to be fleeced, for no better reason than this—that he has made up his mind to try a financial experiment upon them? We can tell him there will be two words about this.

The valued rent of the whole Scottish counties in 1674 was £3,804,221 Scots, or £317,018 8s. 4d. sterling; in 1770, it is believed not to have exceeded, at the very utmost, £1,200,000; about 1795 it had increased to £2,000,000; and it is now stated, in the return lately ordered by Mr. Villiers, at £3,586,527, and including mines, minerals, railroads, canals, &c., at £9,481,762; and manufactures, commerce, and trade have increased in proportion. The Bank of Scotland was instituted in 1695, the Royal Bank in 1727, the British Linen Company in 1746; and they were followed at some little distance by others. Now, as the whole amount of coined money in Scotland at the period of the union did not amount to more than one million sterling, we leave it to the candid and unprejudiced reader to say if it can be denied that this mighty improvement in the face of the country, in the gross rental, in commerce, manufactures, and trade, has been produced mainly, if not entirely, by the ample accommodation afforded to the proprietary and industrious classes of Scotland by her stable and judicious system of banking and currency? Through what other channel could the available capital have been obtained in this proverbially poor country?

The committees of the Lords and Commons of 1826 attested this truth, and yet the Minister of the day, trusting to his majority of ninety-five, and with the perfect knowledge of all I have said, still entertains the idea of attacking our banking and currency systems, and, of course, of ruining Scotland. Resting on his majority, he no doubt concludes that

“The pliant populace,
Those dupes of novelty, will bend before us.”

But he will please to remember that

“There was never yet philosopher
That could endure the tooth-ache patiently.”

We intreat that the right honourable gentleman will pause and consider, and we have no doubt that his practical judgment will produce self-conviction; and let him remember, as well he knows,

“That self-conviction is the path to virtue;
And honourable candour thus adorns
Ingenuous minds.”

We intreat that he will pause ere the peaceful people of Scotland are provoked to wrath by insolent indifference to their feelings, wishes, and prejudices, and reckless tampering with their vital interests. If they are once provoked to insubordination and outrage, in what they will undoubtedly deem a just and honourable defence of their rights, then shall I cry to the Premier—

YOU WERE WELL AND TIMEOUSLY WARNED;
Go, rash man, and now
“Preach patience to the sea, when jarring winds
Throw up the swelling billows to the sky;
And if your reasons mitigate her fury,
My soul will be as calm.”

I am, &c.,

OBITER DICTUM.

AGRICULTURAL QUERIES.

TO THE EDITOR OF THE MARK LANE EXPRESS.

SIR,—Under “Notices to Correspondents”—“Vegetative Principle”—in your paper of May 4th, I observe a remark that no fermentation in the manure heap will destroy the vitality of seeds. Could you or some of your practical correspondents inform me if the vegetative principle is injured in the seed of hay, which has heated or fermented in the rick, and if it be safe to sow some for a grass crop? Hay-seed is here generally thrown out as useless if it has heated in the rick, thereby entailing considerable expense in purchasing, which would be saved to the farmer, who could use his own if your answer be favourable to
A SUBSCRIBER.

Waterford, May 9th.

SULPHURIC ACID AND BONES.

SIR,—Will any of your correspondents have the kindness to inform me whether boiled or raw bones are most effectual when mixed with sulphuric acid—and whether this manure is best adapted for any particular soil? And so oblige, sir, your obedient servant,
R. B.

Whitchurch, Salop, May 6th.

SIR,—As a manure, in the neighbourhood where I reside, chalk is much used; but, as we follow the old-school practice, and some of us prefer the chalk procured from a distance to that dug at home, I should much like to know in what way there can be a difference in the kinds of chalk, and what really are the best ways, the best time, and the most proper land and crops for applying chalk to as a manure. Perhaps you can help me to some of this information, and so oblige

Yours, truly,

A YORKSHIREMAN.

May 13.

SIR,—You would oblige me and others by inquiring through your paper the *most effectual and cheapest* mode of destroying *hemlock plants* in grazing and meadow land. I have fields of good sheep-grazing land (soil, hazel loam) that are much injured by these roots.

I am, sir, your obedient servant,

April 28, 1846. A LINCOLNSHIRE FARMER.

SIR,—Having realized by professional pursuits a sufficiency to enable me to retire altogether from office-life, and having recently purchased a residence, with an estate of about a hundred and forty acres attached to it, which it is my intention to occupy and cultivate, I should feel favoured if some of your indulgent readers would oblige me with what they practically consider to be the first principles of agriculture, and also with the names of one or two of the best modern treatises on the science of agriculture. Feeling assured that he who is above asking for information will always remain ignorant,

I am, sir, yours truly,

May 1, 1846.

ENQUIRER.

SIR,—Having never yet met with a satisfactory solution to the following question, I should feel obliged if you or some of your correspondents would enlighten me on the subject. It is not an uncommon thing on a well-cultivated farm for the land now and then to become sick or tired of clover; and when this crop fails, the wheat which succeeds it to a considerable extent fails also. What is the cause of this deficiency?

I am, sir, yours truly,

May 8th.

A FARMER.

ANSWERS TO AGRICULTURAL QUERIES.

LONDON SEWAGE.

TO THE EDITOR OF THE MARK LANE EXPRESS.

SIR,—The subject of “London Sewage” of late years has been many times before the public both as a sanitary question, and one also as bearing upon the interests of agriculture; in the latter case, from the fact that an immense quantity of one of the finest enrichers of the soil is allowed to run to waste, which might be turned to profitable account if scientific means were resorted to for husbanding it up, and the matter thus obtained was afterwards employed as a manure to the land. In your paper of the 20th of April, “T. H. B.” made reference to a report by Mr. Hawkins on the

average discharge of sewage, in reply to a former correspondent, and gave several extracts from it; but as the amount of discharged matter into the Thames, which he quoted, seemed extravagantly great, I have been induced to refer to a copy of it myself, and find from some simple explanations by Mr. Hawkins, which "T.H.B." in the brevity of his letter did not give, that the statement of discharged amount does not now appear to me an exaggeration. With your permission I will therefore give those explanations of Mr. Hawkins's, and then carry out the results: so that any misgivings in the minds of others on the subject may, like to my own, be removed. Mr. Hawkins states that a number of experiments were made in the months of May, June, and July, in fine weather, on twelve sewer outlets, draining an area of about 7,000 acres; the mean discharge deducible from these experiments being about 256 cubic feet per acre, in twenty-four hours. "If," says Mr. Hawkins, "the district to which the accompanying observations refer, be a fair type of that included within the whole of the Metropolitan Commissions of Sewers, and taking the extent of the active jurisdictions of those on the north side of the River Thames at 43 square miles, and the jurisdiction of the Surrey Commission at 15 square miles, the ordinary daily amount of sewage discharged into the river on the north side would be 7,045,120 cubic feet, and on the south side 2,457,600 cubic feet, making a total of 9,502,720 cubic feet, or a quantity equivalent to a surface of more than 36 acres in extent, and 6 feet in depth.

I am, sir, yours, &c.,

April 27, 1846.

A CONSTANT READER.

SULPHURIC ACID AND BONES.

SIR,—“R. B., of Whitechurch, Salop,” inquires which is best to mix with sulphuric acid—raw or boiled bones? There are various opinions at the present day as to the propriety of boiling bones or not before they are used: this is certain, that, in all manures you apply to the soil, they should contain certain elements of the plants you wish to produce from the land, as well as stimulants to vital action. Now, in the oil and fat, &c., in and about bones, and which are removed by boiling, are found carbon, oxygen, and hydrogen, elements that are also ever present in all vegetable matters; by combining this oily and fatty matter with sulphuric acid, you do not destroy these elementary principles, you only cause them to form new combinations; and when they are applied to the land, either in the original form or the new state, the vital process of vegetation remodels just sufficient from them of the different elements which the plant requires, and no more; therefore all your chemical changes induced by preparing artificial manures, if they be good, only tend to make this food for plants in a more ready state for being absorbed into the plant itself. I would refer R. B. to the report in your paper on January 5th, 1846, of the Sturminster Agricultural Society, and recommend him to read carefully the practical and scientific address of Mr. Huxtable, on management of manures; he will there find that Mr. H. recommends sulphuric acid to be poured on animal

matter, for making an artificial manure equal to guano. The land apparently best adapted for receiving the bones with sulphuric acid is the same as that where bones in the simple state are found to be most beneficial, viz., on light, dry, sandy soils, peaty soils, light loams, &c.

I am, Mr. Editor, yours,

May 16.

A WOLF FARMER.

SIR,—The botanical name of the plant, about which your correspondent “Rusticus” inquires, is *Chenopodium bonus Henricus*; and the English name is *Mercury Goosefoot*: it is of the Linnæan class and order *Pentandria Digynia*, and in the natural order of *Chenopodiæ*. It is the only species of the *Chenopodiums* wild in England, which is *perennial*, and may frequently be met with in waste ground and by roadsides. I have many times gathered it in the neighbourhood of London. It may be eaten, *when young*, like spinach, and is cultivated for the table in some parts of Lincolnshire. It is insipid and mucilaginous, rather mawkish, and soon becomes tough and fibrous. It is in no way comparable to the common spinach; but *de gustibus non &c.* It certainly may be somewhat improved by being grown in a rich soil.

I am, sir, yours, &c.,

Lynn, April 28, 1846.

F. L. S.

SIR,—Allow me to inform your correspondent, “Rusticus,” who has made inquiries after the vegetable known in Lincolnshire by the name of Mercury, that it is difficult to find it in cultivation much away from that part of the country, spinach having superseded it in most gardens; it is still a very general vegetable in the kitchen gardens of Lincolnshire, and is by many preferred to spinach: its botanical name is *Chenopodium bonus Henricus*. Its mode of cultivation and management is simple, being propagated from the seeds, which are easily gathered: it is a perennial plant, and is cut for the table very early in the spring; after it has flowered, it is no longer fit for that purpose. It is mown down early in the summer; and a little rotten manure forked in just previously to the plant beginning to shoot completes the whole system of management.

I remain, sir, yours,

May 1, 1846.

A FEN FARMER.

SIR,—Among your correspondents I observe one who signs himself “Enquirer,” who wishes to have his ignorance enlightened concerning the “first principles of agriculture.” The first principles of agriculture are said to be contained in the two words “*arare et stercoreare*,” and farmers concisely sum up these principles by draining their land when it is wet, cleaning it when foul, and manuring it when poor. This is the sum total of farming; but the description of these apparently simple operations would occupy too much space, and therefore I beg to refer “Enquirer” to such books as “*Loudon’s Encyclopædia of Agriculture*,” “*Stephen’s Book of the Farm*,” Professor Low’s works, the “*Journal of the Royal Agricultural Society of England*,” or to the “*Transactions of the Highland Society*.”*

I am, sir, your obedient servant,

May 12th.

H.

* Also the “Farmer’s Magazine.”

CALENDAR OF HORTICULTURE.—JUNE.

RETROSPECT.—Since the year 1799—that year which spread desolation through Britain, and raised the quartern loaf to 1s. 10½d. in London, and to above 2s. in some parts of the country—we can find no corresponding example of a fall of rain so considerable as that which has been witnessed since the period of the last vernal equinox. But then the winter was propitious, and the season forward; whereas in 1799 all had been adverse.

The ground has been, and is now, by the return of copious rains, rendered extremely wet: but this is not the worst concomitant—slugs and snails superabound; and these began their ravages early in the month, devouring carrots, parsnips, onions, lettuces, and the seed-leaves of brassicas; so that we know of instances where three sowings have perished. Peas too have vanished by the row, even long after they were midway up their sticks.

As to fruits, the promise remains pretty fair: the plums, however, which promised so abundant a crop, have just suffered (May 18) a dreadful blight, in all probability originating with the fierce north-easterly current that tore along the ground on the 14th and 15th, parching and scattering the leaves and young spray of trees. This wind preceded, and marshalled in, the profuse rain, thunder, and hail showers of the 17th to 21st days. No great mischief is yet produced, up to the day when these remarks are penned; but the future must become the subject of solicitude. The operations now to be described are what we hope may be easily performed.

VEGETABLE GARDEN.

FIRST WEEK.—*Cucumbers for pickling*.—Open a trench in the centre of a warm plot of ground, sloping a little, if possible, towards the south; make it of dimensions sufficient to contain about two good barrows of warm manure; cover this with light rich earth, made very fine. Then plant in spaces, each about a yard apart, 3 cucumber seedlings, raised previously in a pot, with the balls of earth undisturbed. Three sets of such plants, if properly grown and trained, will supply a large family not only with girkins, but with many table cucumbers. The plants when moved should be showing their first rough leaves, and a hand-glass ought to be placed over them, as a protection from cold and accidents.

Peas, beans, kidney beans.—Sow these immediately for succession. In most situations, these will be the last that can succeed; though in some very fine well-drained gardens, wherein there is al-

ways a good supply of ground moisture, later sowings may be made.

Celery.—Remove the best regular-sized plants to trenches. In order to succeed, the ground ought to be rich in the first instance, and each trench should then be manured at the bottom to the extent of three or four inches, burying the rotten manure, and forking it with the soil till thoroughly incorporated. The trenches must be cut by line, fifteen inches wide, and four feet asunder; the plants to stand in them six or eight inches asunder.

Lettuces.—These can be sown in the richest ground, but they can also be transplanted from seed beds. Most lettuces, so treated, fly to seed; but the “Paris cos” is said not to do so, hence it is a bad seeder. Choose moist weather; or if that be not possible, draw shallow drills with a three-corner hoe; water them freely; repeat the watering; then, about sunset, smooth the sides of the drill by the flat of the hoe, plant a foot asunder, not too deeply, and make each lettuce quite firm. If guano (of first quality) succeed at all in the garden, it is when applied in a fluid state; therefore, to do this safely, bring the guano to a powdered state, breaking up the lumps, and add *one ounce to one gallon* of soft water. Water from the nozzle (not the rose), and give from about a wine-glass to half a pint of the *brown* fluid to each plant according to its size; repeating, with caution, twice or three times, with intervals of a few days.

It is a great pity that we are not equally acquainted with the inorganic constituents of all cultivated crops as with those of the guano. Pending experiments which our colleges of Cirencester and elsewhere ought to institute, we must proceed discreetly, recollecting that sound guano should contain about 30 per cent. of salts soluble in water—namely, *urea* (the base of urine), *phosphate* of ammonia, *sulphate* of potassa, *muriate* of soda, and also all these interchangeably both as to bases and acids; sometimes also *oxalates* are traced. The solid matters comprise much bone-phosphate of lime in the most useful state of impalpability, a still greater bulk of organic animal matter (call it *animal humus*), 14 or 15 per cent. of urate of ammonia—both the latter destructible by fire, and of slow decomposition in the ground. With the bone-phosphate, when separated by combustion, we have never failed to detect iron as a *per-oxide*, some *magnesia*, carbonate of *lime*, some trifle of *alumine*, and from 1 to 3 per cent. of

sand. The chemical reader will perceive at a glance what an agency he has at command in this wonderful epitome; and to encourage the prudent gardener, we can assure him that, although the writer claims no extent of practical *knowledge*, he has produced the most decisive effects upon the cabbage—100 plants that have received certainly less than 1lb. in weight, being some of the most luxuriant. Strawberry plants, berry-bearing shrubs, asparagus, and rows of peas have had proportionate waterings, care being taken to avoid the leaves; and in no instance has any mischief followed the application.

Sow *Radish*, small *Salad*, round *Spinach* at any time, remembering always to water the drills first, if the weather be dry.

Red-beet, *Carrots*, and *Parsnips*, thin them to convenient distances; hoe, and clean the ground from weeds.

Onions also should be attended to. The hoe does great service to this bulb, even in the driest seasons, as that of 1844, when by this tool alone, without a drop of water, fine beds were secured.

SECOND WEEK to the end of June:

Cauliflower seedlings.—Transfer them to a small bed of the richest earth, digged or forked very fine. Set the plants in regular order three or four inches apart, preparatory to final removal. For more forward plants coming to perfection, one or two effectual waterings with a quart or so of the drainage of a dunghill or tank, still further enriched by a quarter of an ounce (a teaspoon full) of guano, would be sufficient for each, particularly if about a pint of plain water were poured around the stem, to wash away and carry down from it the strong liquid.

Endive for blanching.—A few plants of the first sowing are to be set in a spot of chosen ground; it is too early for the main stock.

Borecole, *Broccoli*, *Brussels Sprouts*, *Savoys*, and *Cabbages* are planted out now, either where they are to remain, or some, especially broccoli, into nursery beds to obtain sticky roots. Sow cabbage, for coleworts.

Asparagus.—Cease cutting by the 21st, and always leave one shoot at least to each plant. Ob-literate weeds, and water with guano.

Gather *Mint* and all the sweet herbs, for drying.

Potatoes.—Closely examine the stems, to be sure upon the subject of disease. Hoe deeply between the rows, to give all freedom to the lateral processes. Earth or ridge only where it is seen that the variety tends to bring its tubers to the surface. Wherever possible, it might be a preventive of disease to scatter recently slaked lime, mixed at the same time with a tenth part of coal-soot, over the surface after hoeing. The lime and ammonia would quickly act

upon the plants—the lime itself more durably within the soil.

FRUIT DEPARTMENT.

Apricot, *Peach*, and *Nectarine*.—Go over the trees, and if the work were not done before, remove ill-placed, superfluous shoots and fruit. Let the latter be moderately numerous and equally distributed. Wash the trees thoroughly with the garden engine, and lay mulch over the roots to prevent drought.

Apple, *Pear*, *Plum*, and *Cherry*, on walls and espalier.—Many regulate these trees for spurring, at two operations, beginning now. We prefer to wait another month, but would thin the fruit.

Vines require frequent prunings. All the fruitful shoots ought to be stopped at a joint or two beyond a cluster. Nail in the retained shoots. Displace those that are superfluous.

Strawberries.—Water, in dry weather, freely and to the roots, or not at all. If fine, growing showers and warm sun alternate, all fruit will be early; grapes and strawberries also, and abundant.

The *early Vinery* will be out of work. Give air, or rather, if possible, expose the vines. The later house will require no fire, and little close vapour after the stoning process, but plenty of front and back air to sweep through the foliage, without admitting rain.

Keep *Pines* always moist and growing. The fruiting-house dryer, and more aired during hot sun.

Melons want no bottom heat: plenty of air, sprinkling over the leaves three or four times a week, and immediately closing the pits while the sun shines warm on them, are the chief requisites.

FLOWER GARDEN.

If possible, keep the *Heaths*, *Camellias*, *Epacris*, and similar hard-wooded plants, in a house that has a north aspect. Give air, and water freely. Cool, deep, *shaded* pits answer well.

Order and regularity in culling flowers, removing old stems, and whatever is unsightly, are the chief duties. With these, the raking of surface-earth, sweeping and rolling lawns, and gravel walks, should go hand in hand.

Transplant *Annuals*. Plant out *Balsams*, *Stocks*, and other favourites—*old* as well as new—to keep the mixed beds and borders always well furnished.

The *parterres* of selected, single masses, comprise many of the greenhouse plants; and all such pelargoniums as are not intended to be kept over the winter, should be placed in masses.

As *Bulbous* plants wither, remove them; dry the roots in the air, and pack them in bags or drawers; tigridias in perfectly dry sand: thus treated, few are lost.

METEOROLOGICAL DIARY.

BAROMETER.			THERMOMETER.			WIND AND STATE.		ATMOSPHERE.			
Day.	8 a.m.	10p.m.	Min.	Max.	10p.m.	Direction.	Force.	8 a.m.	2 p. m.	10 p. m.	
April	21	30.09	29.99	36	52	42	N. West	variable	cloudy	cloudy	cloudy
	22	29.89	29.88	37	54	42	E. by S.	lively	cloudy	cloudy	cloudy
	23	29.86	29.80	38	53	46	S. by E.	lively	fine	sun	cloudy
	24	29.80	29.85	42	53	45	S. East	gentle	cloudy	sun	fine
	25	29.88	29.87	43	55	46	Every way.	gentle	fine	cloudy	cloudy
	26	29.80	29.80	41	48	36	N. by W.	gentle	cloudy	cloudy	fine
	27	29.88	29.89	32	48	41	N. West	gentle	fine	sun	cloudy
	28	29.88	30.00	36	55	40	Westerly, N.	gentle	fine	sun	fine
	29	30.18	30.20	33	54	48	N. West	gentle	fine	sun	fine
	30	30.27	30.30	43	58	47	N. West	gentle	fine	cloudy	cloudy
May	1	30.30	30.29	45	58	53	Var.—W.byS.	gentle	cloudy	cloudy	cloudy
	2	30.27	30.17	50	63	56	N. W.	gentle	cloudy	cloudy	cloudy
	3	30.11	30.00	51	65	56	East	brisk	cloudy	cloudy	cloudy
	4	29.89	29.78	51	63	53	S.E. by S.W.	brisk	fine	cloudy	fine
	5	29.77	29.60	52	61	53	S. West	brisk	fine	cloudy	fine
	6	29.57	29.57	49	60	52	Westerly	gentle	fine	cloudy	fine
	7	29.65	29.75	48	60	52	Westerly	gentle	fine	sun	cloudy
	8	29.85	29.94	49	63	50	N. West	gentle	fine	sun	fine
	9	29.97	29.90	48	66	54	S. West	lively	fine	sun	cloudy
	10	29.80	29.99	48	61	48	W., W. by N.	variable	fine	cloudy	cloudy
	11	30.10	30.09	43	60	47	S.W., E. to N.	gentle	fine	sun	fine
12	29.99	29.90	42	63	52	Easterly	gentle	fine	cloudy	cloudy	
13	29.90	29.75	49	59	52	N. East	brisk	cloudy	cloudy	cloudy	
14	29.98	30.02	48	58	48	N. East	strong	fine	sun	fine	
15	30.00	29.90	41	58	47	S. East	brisk	fine	cloudy	cloudy	
16	29.74	29.40	41	58	50	N. to S.E.	variable	cloudy	cloudy	cloudy	
17	29.27	29.22	46	54	44	S.W., W.	gentle	cloudy	cloudy	fine	
18	29.10	29.10	42	57	48	W. S. W.	strong	cloudy	cloudy	cloudy	
19	29.46	29.57	41	58	51	E. by S., S.	brisk	fine	cloudy	cloudy	
20	29.48	29.55	49	62	46	S. W., N. E.	lively	fine	cloudy	fine	
21	29.64	29.98	41	68	49	E. by North	gentle	cloudy	sun	fine	

ESTIMATED AVERAGES OF MAY.

Barometer.		Thermometer.		
High.	Low.	High.	Low.	Mean.
30.330	29.160	70	34	54

REAL AVERAGE TEMPERATURE OF THE PERIOD.

High.	Low.	Mean.
58.22	43.7	50.645
North and N. East Winds.. 7 days.		
East and to South..... 8½		
South and South West..... 7¼		
West and to North 8¼		

WEATHER and PHENOMENA.—21, gloomy, with gleams; 22, cheerless, hints of rain; 23, fine, very drying; 24, some rain early; 25, thunder at times; much gentle rain; 26, profusely wet night; clear after 1, A.M.; 27, just frosty; fine cool day; 28, fine, changeable, a shower; 29, sunny and warm; 30, fine early, then cloudy.

LUNATIONS.—New moon 25th day, 4 h. 48 m., P.M.

May 1, rain early, cloudy and mild; 2, warm, and growing gleams; 3, changeable, exceedingly

close forenoon; 4, changeable, streamers at night 5, some rain, fine growing weather; 6, slight rain; 7, fine; 8, finer; 9, again changeable; cirrus streamers and stratus; 10, fine, though cloudy; thunder at times; rainbow at sunset; 11, very fine and cold; 12, changeable; 13, windy, cold, wet day; 14, drying; fine and fresh; 15, same, but parching wind; 16, drizzling, rainy evening; compound starchy clouds; 17, profuse rain early; cold; 18, very showery; 19, many showers; some hail; thunder at a distance; gleams; 20, again showery; 21, very much improved, with some promise.

LUNATIONS.—First quarter, 3rd day, 11 h. 52 m. morn; full moon 11th, 6 h. 6 m. morn; last quarter 18th, 1 h. 27 m. morn.

REMARKS CONCERNING AGRICULTURE.—The crops are even, regular, and promising; but the cold rains, and long-protracted even temperature has checked the promised precocity. All the fodder crops are wonderfully luxuriant near our vicinity; and if the weather take up, with warm nights, everything will go on well.

JOHN TOWERS,
Maidenhead Thicket.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR MAY.

Like that of many previous months, the weather, since the date of our last report, has been extremely changeable, yet, on the whole, favourable to the growing crops, as well as vegetation in general. Although both the winter and spring sown wheats have not made that progress which might have been anticipated, they are seasonably forward on most soils, especially on the light lands, and present, with some exceptions, a favourable and promising appearance. Still, we must not forget to mention that, in some districts, the blade assumed a very yellow complexion about the middle of the month, but which has since, from the fine showers which fell between the 18th and 22nd, become more healthy. Although many contradictory reports have reached us on the subject, we have no hesitation in saying, from the inquiries we have made in our large grain counties, that the breadth of land under wheat culture this year exceeds that of many preceding seasons. So far this is gratifying; assuming, as we do, that the produce of that description of grain *ought* to be the great means of support to the agricultural body; but passing events in the political world fill our minds with fear for the future in this respect. The measure which has received the sanction of the House of Commons, for the admission of grain and flour for home consumption at low duties, cannot, in our opinion, in the generality of years, but have a prejudicial effect upon the interests of British growers. Even the free traders themselves admit that future prices of corn must rule considerably lower than at present, and the question now mooted by the consumers is, Has it become necessary to tamper with the existing Corn Laws on the ground of scarcity? Upon this all-important topic of consideration, viz., whether the available supplies of bread stuffs are really deficient, we shall here offer a few remarks. It will be recollected that, at the period the harvest of 1845 was brought to a conclusion, great was the outcry raised by the League that its produce was extremely deficient, both as respects quantity and quality; hence unusually high prices were predicted. In our capacity as public journalists we felt it our duty to endeavour to disabuse the minds of our readers on the matter; plainly telling them, as we did, that though partial deficiencies in the wheat crop were observed in some parts of England, the crop was nearly an average one; and the positive falling off in quality, so strongly urged by some parties as an

earnest of famine quotations, was nearly, or quite, made good by the then large quantities of old wheats on hand. That our observations and predictions respecting future supplies and prices have been verified, is proved by passing events, as we find that the quantities of most articles of grain on sale, for some time past, in our various markets, have been fully adequate to meet the wants of the dealers; but prices have suffered a considerable depression during the past month. These changes in the features of the corn trade are, we perceive, principally attributed to the unwillingness on the part of the trade to increase their stocks so near the time when the whole of the bonded supplies of foreign grain and flour will be taken out of the bonded warehouses at a low duty, and which (if we include the latter article) will fall little short of 2,200,000 quarters, exclusive of those now on their passage. What stronger arguments could we make use of to prove that low import duties *must* act prejudicially to the British yeoman? Again, we have been informed, in the usual "soft sawder" fashion, that a revival of demand and value will take place immediately after the passing of Sir Robert Peel's measure. Such *may* be the case; but we incline to the opinion that the principal millers will act with that degree of caution which has so long characterised their transactions, and thereby keep prices at about their present level, especially when they consider that we have more corn in the country than we can conveniently consume between this and the close of harvest operations.

Spring corn, especially beans and peas, is looking remarkably strong and healthy, with every prospect of good crops. The stocks in the hands of the growers are quite as large as we have had occasion to report at this time for some years past.

The show for fruit in the whole of our large districts is an excellent one, particularly in Devonshire and Kent, notwithstanding the blight has attacked many important plantations.

Owing to the great abundance of pasture and other herbage, the demand for both hay and straw in our markets during the whole of the month has ruled very dull, and the quotations have experienced a decline of from 4s. to 6s. in those of the former, and fully 2s. per load in those of the latter.

The crop grasses are well represented, and in some quarters hay making has partially commenced, under the most favourable auspices, the produce

being considered large. Some time must, however, elapse ere this department of field labours can become general.

It is very gratifying to be enabled to state that the epidemic amongst cattle, which we stated in our last report as having somewhat increased in violence, has greatly subsided, and that scarcely any losses worthy of mention have come under our notice within the last three weeks.

As we have long predicted, the imports of live stock from abroad, under the operation of the new tariff, have considerably increased, though we cannot report quite so favourably of the general quality of stock lately received from Holland as on some previous occasions.

Our advices from Ireland and Scotland state that full average supplies of corn have been on sale in the various markets of consumption. Generally speaking, the demand has been in a very inactive state, quotations have declined from 1s. to 3s. per qr.

Potatoes, as has been the case in the metropolitan market, have risen in value; yet the supplies, large portions of which have been in a very diseased state, have been rather extensive. The reports respecting the appearance of the new sorts are by no means satisfactory, the disease having made its appearance on many newly-planted soils. The few shipments made to this country from the Azores, Spain, &c., have turned out most unprofitable speculations.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Having long watched, with intense interest, the effect likely to be produced by the new tariff upon the value of the property of the agriculturists we, as practical men, feel it incumbent upon us to offer a few observations upon a statement which has lately found its way into the columns of the "Times" newspaper, respecting the results likely to arise from the admission of foreign cattle into our markets, free of duty, for consumption here. The writer of the statement in question, who, we are informed, is an English gentleman, who has, for upwards of twenty years, farmed his own estate in Northern Germany, sets out with the following assumptions:—

"My decided conviction is, that *no quantity of stock* which can now, or for many years to come, be spared from the home consumption of Germany, *can in any degree lessen the profits of the English farmer, or produce any perceptible fall in the markets*; and I ground my assertion on the following data:—1st, whilst *the importation of foreign cattle into England* during the last three-and-a-half years has (with exception of the panic period) *caused no diminution whatever of English prices, the small number of 8,000 head removed from our consumers has produced so sensible a rise in our markets, that good meat now fetches in this country very nearly as much as in England!*"

Now, though this said correspondent may be a most wise personage in his way, we plainly tell him his "facts" are directly at variance with the truth. What! are we to be told that *no quantity of stock* that can be spared from Germany will lessen the profits of the English grazier? and that *no fall* has taken place in the quotations here, consequent upon the arrival of foreign cattle? The idea is preposterous; it is against the general rules of trade; consequently, unworthy of credit for a

single moment. If our readers will do us the favour to watch narrowly the reports which we give from time to time, they will find that, during the present year, beef has declined in Smithfield market 6d.; mutton, 8d.; lamb, 10d. to 1s.; and veal, 6d. to 10d. per 8 lbs.: and yet our understanding is to be insulted by the remark that *no fall* has taken place in prices in this country! Now, since the 1st of January, current year, not less than **THREE HUNDRED AND FIFTY** beasts, on an average of weeks, have appeared on sale in the above market from Holland, Germany, and Prussia; and which, as a matter of course, have displaced an equal number of home-fed animals. These supplies, be it understood, have diverted from the hands of the English grazier to that of the foreigner not less than **ONE HUNDRED THOUSAND POUNDS**; and that amount has been withdrawn from the country within *five months!* Supposing, then, the profits of our breeders to be five per cent., we here show an actual loss to our graziers of not less than five thousand pounds! As to the assertion that the value of stock has advanced abroad, we here give this wise-acre's lucubration the flattest contradiction; knowing, as we do, that such a remark is unfounded in fact. But, if good meat produces nearly as high a price in Germany as with us, why is the speculation continued? for it is self-evident if the owners could obtain such prices at home as are here referred to, they would not be disposed to risk the "chances" of our market, and probably incur considerable loss.

But there are one or two other points in this said epistle demanding our attention. For instance, it is asserted—

"When the *inferior class of animal bred in Germany* is taken into account, with their *heavy heads and foreheads*, their long legs, and their light hind

quarters, it will, I think, be granted, that such can never be classed higher than with *second-rate beef* in England."

Without wishing to prejudice this *wise man* in the estimation of his readers, we here boldly assert that *he has never seen any of the animals which have been recently imported into this country from Prussia*, and which have found buyers in the Metropolitan market. Having ourselves seen the whole of them, we may state, without fear of contradiction, that they have equalled, in quality and condition, some of our best breeds; and, to show that we are correct in this important particular, we may state that many of them have sold as high as £21 each, without weighing more than 115 stones each! Be it observed, those who visit Smithfield are not all "*green-horns*;" hence it is not very likely they would give more than the value for either beasts or sheep. Then this scribe favours us with a long dose about the difficulty of getting the beasts over the "*arid sands*" of Prussia to the place of shipment; and he asks, "in what condition will they arrive in England?" So far as our observation has extended, we maintain that no beasts could come to hand in better condition than those which have been received from Prussia via Rotterdam, although they have had to travel over those "*arid sands*" to the extent of nearly *two hundred miles*! But what is required to improve these said sands, but English gold? Let that be obtained, and the sandy plains will speedily become the most fertile spots in Germany, and our markets will be inundated with their produce.

During the month just concluded, the annexed imports of beasts have taken place from abroad into London:—

WHENCE.	HEAD OF BEASTS.
Hamburgh	54
Rotterdam	660
Harlingen	122
Prussia	121
Total	957

The numbers of sheep have amounted to 975, of lambs 24, of calves 10, and of pigs 58; while at the outports nearly 600 beasts and sheep have come to hand from Holland. At the corresponding period in 1845, the arrivals of beasts into England amounted to 900, and of sheep 200 head; consequently, it will be perceived, a larger increase has taken place this year.

From our own grazing districts, the receipts of both beasts and sheep, up to Smithfield market, have been considerably on the increase, and of unusually fine quality; indeed, the exhibition of stock on each day, as to condition, has seldom or never been surpassed on any previous occasion. As might therefore be expected, the trade has ruled heavy, and the general quotations have had a downward tendency, and clearances have not

been made. The following is a comparison of the supplies:—

	May, 1845.	May, 1846.
Beasts	14,117	14,287
Cows	520	541
Sheep	130,930	123,970
Lambs		
Calves	1,436	1,267
Pigs	2,501	2,380
Totals	149,504	142,445

Although the numbers have not quite equalled those of May, 1845, they have carried a much larger quantity of meat and fat, consequently the show in these respects has been very inferior; and we hesitate not to say, that as the season advances, a considerable increase in the numerical strength of the droves will be apparent.

The beasts have been derived as under:—

Norfolk, Suffolk, &c	7,200 head.
Northern counties	1,250
Western and Midland districts	2,300
Scotland	1,600
Ireland	800

Total 13,150

From the above, we find that Norfolk has sent us about 1000 beasts more than at the same time last year, when the number was 6,300 head. The remainder of the supplies have been derived from abroad, and the neighbourhood of the metropolis. A larger number of lambs, viz., 1,870 head, has reached us from the Isle of Wight.

Prices have been as under:—

	Per 8 lbs. by the carcass.			
	May 1845.		May 1846.	
	s. d.	s. d.	s. d.	s. d.
Beef from 3 0 to 4 6	2 6	to 4 0	4 0	
Mutton .. 3 4	5 0	3 4	4 4	
Lamb .. 4 10	6 0	5 0	6 0	
Veal 4 0	5 2	3 10	5 0	
Pork 3 0	4 2	3 8	5 0	

Up to Newgate and Leadenhall markets, in which have been exhibited about 150 carcasses of foreign beasts, and 400 do. of sheep, the arrivals of slaughtered meat have been moderately extensive, and of fair average quality. Generally speaking, the trade has been in a very sluggish state, at depressed currencies; beef having sold at from 2s. 4d. to 3s. 6d.; mutton, 3s. to 4s. 2d.; lamb, 5s. to 6s. 2d.; veal, 3s. 10d. to 5s.; and pork, 3s. 4d. to 5s. per 8 lbs., by the carcass.

ARRIVAL OF CARCASSES DURING THE MONTH.

	Beasts.	Sheep.	Calves.	Pigs.
Scotland	112	1560	—	1100
Yorkshire	150	1740	—	1350
Lincolnshire ...	205	540	—	390
Norfolk	100	370	—	400
Suffolk	85	380	—	390
Cambridgeshire..	180	370	—	350
Essex	90	270	270	390
Surrey	210	450	270	530
Devonshire	—	30	10	190
Wiltshire	100	370	200	330
Other parts	210	550	360	600
Total..	1442	6630	1110	6020

REVIEW OF THE CORN TRADE

DURING THE MONTH OF MAY.

The new Corn Importation Bill has passed the third reading in the House of Commons, by a majority of ninety-eight, and was read the first time in the House of Lords on the 18th instant. The discussion on the second reading commenced on the 25th, and had not been brought to a termination when it was necessary for this article to be put in type. There is, however, very little doubt but that Ministers will again succeed in obtaining a majority; but it is not so certain that the bill will go through committee without alteration, and many are still sanguine that it may be rejected. We must confess that we cannot hold out strong hopes of such an occurrence, and fear that the days of protection to native industry are numbered. The Premier has not been very gently handled by the leaders of the country party; and though we are decided enemies to personal invectives, it must be acknowledged that the conduct Sir Robert Peel has pursued in deliberately throwing overboard the party who brought him into power, and espousing the cause of the opponents to the principles he was returned to uphold, has richly merited the treatment he has received.

Previous to the first reading of the Irish Coercion Bill, it was generally deemed doubtful whether the incongruous materials of which the present ministry is composed would hold together, and a hope was felt that an appeal to the country would become necessary. Even now this notion is pretty generally entertained, it being thought probable that alterations in the Corn Importation Bill may be suggested in the committee of the Upper House which the Commons may refuse to sanction, in which case a dissolution of parliament would follow. Farmers do not, however, appear to place much reliance on this their last chance, and within the last few weeks they have manifested much greater anxiety to clear out the remainder of their stocks than had been previously shown, confidence in the present laws being maintained having been wholly lost. At the same time merchants and millers have from day to day become more unwilling to purchase beyond what they have required for immediate use, calculating on prices being materially depressed if the free-trade policy of the Cabinet should be carried out.

In this position of affairs the value of all species of agricultural produce has been depreciated, and wheat—the article of first importance—has, within

the space of three weeks, fallen at least 8s. per qr. in all parts of the kingdom. So great a fall we were hardly prepared to expect; but a species of panic seized holders, about the time the bill passed the third reading, and the effect which this was calculated to produce was considerably heightened by the interval of fine weather experienced towards the latter part of April, and the beginning of May; for though there was a want of that genial warmth so requisite at this period of the year, the weather was on the whole propitious up to the 12th inst.: on that day we had a return of wet, which lasted till the 20th, but since then it has been fine. The quantity of rain which has hitherto fallen may not have done actual mischief to the growing crops, still it has given rise to some uneasiness, more especially as respects wheat, which is said to have run up speedily without tillering. The colour is also a good deal complained of, and the prospects for the future are certainly less promising than they were in the early part of the spring. A great deal will, however, depend on the weather during June, that being usually the month when atmospherical changes are productive of the greatest influence. With a hot dry June little or no ill consequences would, in our opinion, result from the late heavy rains; indeed, in that case it might in the long run prove a benefit; but it is certain that the crop is not in a position to stand much more wet without being in some degree injured. We have now arrived at a time of the year when a few wet or fine days produce so great an effect on the minds of buyers and sellers that it would be absurd to pretend to predict the probable range of quotations; but leaving the weather out of the question, we certainly think circumstances do not warrant the expectation that the value of wheat will be lower than it now is.

Much stress has been laid, by those who calculate on extremely low prices, on the stock of foreign wheat in bond in the kingdom; and a million and a half of quarters, it must be confessed, seems a large quantity to be liberated. On the other hand, it must be remembered that millers and merchants have long been looking out for the release of the lock wheat, and have, in anticipation of that event, allowed their stocks to run to an unusually low ebb; if, therefore, the farmers do not hold more wheat than in ordinary seasons at the corresponding time, the release of what is in bond will not, in

our opinion, have any permanent effect on quotations. It is estimated that the millers ought never to be without a sufficient quantity of wheat on hand to provide for two months' consumption; and to do this requires between three and four millions of quarters. At the present moment, we much doubt whether there is a miller in England who could carry on his business for ten days without completely exhausting his stock; it follows, therefore, that if the entire quantity of wheat now under the Queen's locks was distributed (as it soon would be, were it liberated) among the manufacturers of flour, they would still be more slenderly provided than in common average seasons.

It seems, therefore, to us that no further fall in the value of the article can well occur, unless the weather should hereafter become of so propitious a character as to give rise to a belief in an unusually early and abundant harvest. Very favourable prospects for the next crop would render farmers less disposed to retain any portion of last year's wheat, and large home supplies coming forward about the same time the bonded may be expected to be freed, would unquestionably tend still further to force down prices.

Within the last week or two the deliveries from the growers have, however, again decreased, and as the hay harvest must now soon engage the attention of farmers, we do not think it probable that the supplies will for some time to come be particularly large.

The most striking occurrence during the month, in connection with politics, has been the meeting in London of the Central Protection Society. The number of agriculturists who assembled on this occasion was so great, and the different resolutions passed condemnatory of the new Corn Importation Bill were carried with such earnestness, that many are sanguine that a beneficial effect may be thereby produced. At all events, the assertion which has on several occasions been made by those in power, that tenant farmers had become indifferent as to what might be done with the corn laws, was at this meeting proved to be untrue. We much regret that the country party allowed affairs to go on so long before they made a demonstration of their disapproval of the ministerial scheme; but even now it may not be too late to do some good should the first step be followed up with spirit and energy. Ministers are unquestionably in a precarious position; and should the present Cabinet be upset—a circumstance by no means improbable—an appeal to the country would enable farmers to return such representatives to the House of Commons as to stay the march of free trade.

In taking our monthly retrospect of the transactions at Mark-lane, we shall have to date the com-

mencement of the important fall which has taken place in the value of wheat from the period that a majority was obtained in the House of Commons on the first reading of the Irish Coercion Bill. An opinion had become very prevalent, that this measure and the Corn Bill might cause such an entanglement as to defeat the object of both; and many had begun to believe that the existing corn laws were safe, at least during the present session. The resumption of the debate on the Corn Importation Bill, and the second and third reading which speedily followed, tended greatly to weaken this impression; and in proportion as the probabilities of the duties on foreign grain being reduced increased, sellers of English became anxious to get out of stock. The first great fall occurred on Monday, the 11th inst.; something very like a panic seemed to have seized sellers, and sales were forced at a reduction of 5s. to 6s. per qr. The wet weather which prevailed during the succeeding week had not the effect of restoring confidence; and though the show of samples at Mark-lane was by no means large, a further abatement took place on the Monday following: even here the retrograde movement did not stop, most of the business done in English Wheat on the 25th inst. being at prices 8s. to 10s. per qr. below those at which sales were made just one month before.

Hitherto this immense reduction has not had any influence on the averages; but in the course of a week or two the low sales must come into the returns, and the aggregate average for the kingdom, which is at present above 56s. per qr., will shortly be reduced several shillings. This is in so far important, as it will, in case Ministers should succeed in carrying their plan, cause a higher duty to be levied on foreign wheat than appeared, when the measure was first introduced, probable. The proposed scale is, it will be recollected, as follows: When the average price shall be 48s. per qr. or under, a duty of 10s. per qr. is to be charged; and for every 1s. per qr. the price rises, the duty is to fall 1s. per qr. until the former reaches 54s.; at and above which point the duty is to remain fixed at 4s. per qr.

Until recently, it seemed, therefore, that in the event of the new bill being carried the wheat in bond would be liberated at the minimum duty of 6d. per bushel; but this is now no longer so certain; indeed, if no rally takes place in prices, and the returns be made with fairness, it is by no means improbable that in the course of a month the aggregate average for the kingdom may have receded to 50s. or even 48s. per qr., in which case either an 8s. or 10s. duty would be chargeable even under the proposed new scale.

So much uncertainty still exists as to the future,

that we do not feel at all surprised that there should have been little or no inclination to make speculative investments in bonded wheat; indeed, up to the present time there has been nothing to encourage speculation, and the operations in foreign have consequently been very unimportant throughout the month.

Till very lately, importers calculated with certainty on sooner or later being enabled to liberate their stocks from under lock at an expense of 4s. per qr., a conviction which imparted sufficient confidence to prevent any fall of consequence occurring in quotations; still the tendency has, on the whole, been downwards.

The business done in bonded wheat has been principally confined to what the millers have been compelled to take for mixing with the inferior qualities of English. What has been bought has, therefore, been immediately released, not in the ordinary way, by paying the duty, but by substituting flour for the wheat required, under the provisions of the Grinding-in-Bond Bill. This mode of liberating wheat has been much in use of late; the power of transferring the certificates, granted on placing a given quantity of flour under lock, affording facilities for this kind of business which would not have existed if the documents had not been made transferable. The selling and buying of certificates has lately constituted a separate branch of trade; large parcels of flour have been placed under the Queen's locks at Liverpool, Glasgow, and other ports, for the express purpose of obtaining certificates; these have been sent to London, where they have met a ready sale at prices rendering the cost of liberating a quarter of wheat 10s. 6d., and the whole of the bonded wheat which has lately been entered for home consumption has, therefore, been rendered free at a lower rate by some 5s. or 6s. per qr. than the actual duty.

In addition to the vent thus afforded for lockwheat a few cargoes have been taken during the month for export to Antwerp, consisting mostly of inferior qualities received from the Mediterranean; still the stock in bond has increased, the arrivals from abroad having been on a more liberal scale than might, from the little encouragement the English markets have held out to consign, have been expected.

From the official return of the quantities of grain under lock in the United Kingdom just published, it appears that there were 1,399,555 qrs. of wheat on the 5th inst., besides 1,119,927 cws. of flour.

The sale of the last named article has been much influenced by the depreciation which the value of wheat has undergone. For some weeks the nominal top price of town-made has been unsettled, it having been variously quoted 49s., 52s. to 53s. per sack by different millers. The first of these prices

may now be considered an extreme quotation, and secondary qualities of flour, whether of town or country manufacture, have recently been selling at very low rates.

From Canada no supplies have yet reached us; but from the United States the arrivals have been very large: on one or two occasions upwards of 20,000 barrels have been received in the course of a single week at the port of London alone; whilst at Liverpool, Glasgow, and other places, the arrivals have been on a still more extensive scale. Bonded flour has become nearly unsaleable: at Mark-lane, fair brands have been in vain offered at 26s.; and at Liverpool, Western of fine quality has been sold at the low rate of 25s. per barrel. Those parties who some time ago put free flour under lock, with a view of getting certificates, are not likely, therefore, to derive much profit from the experiment.

The malting season having some time ago terminated, there has been little or no demand for the finer kinds of barley. Had it not been for the uncertainty felt as to the corn laws, maltsters might perhaps have been tempted by the lowness of prices to buy to hold over; but under existing circumstances the favourite policy appears to be to act on the reserve. Notwithstanding the smallness of the supplies coastwise, and the absence of any arrivals of this grain of importance from abroad, prices have gradually receded, and towards the end of the month really good malting samples were sold at 32s. per qr., and other descriptions on proportionably reduced terms. The fall has not been so great on grinding sorts as on the finer kinds, and sweet feeding parcels have not been offered below 26s. to 27s. per qr.

The operations in malt have been on a strictly retail scale; the value of the article has in consequence of the languid nature of the inquiry, and the depression in the price of barley, given way 1s. to 2s. per qr.; but this decline has failed to tempt buyers, who have refused to take more than their wants have rendered necessary.

During the first half of the month of May, comparatively large supplies of oats arrived in London from our own coast; and though the receipts from Ireland were about that period only moderate, the total quantity received was sufficient to prevent any scarcity of this grain being felt; indeed, the supplies have, taking the month as a whole, been more than have been required for the consumption of the metropolis. The dealers have meanwhile displayed the greatest unwillingness to add to their stocks, prices have consequently receded week after week, and are at the close about 2s. per qr. lower than they were in the beginning of the month. It is now pretty certain that the shipments from Ireland will be greater than we

were led to believe, and as preparations are in active progress at many of the near continental ports, to ship this grain to Great Britain, it may be questioned whether even our present quotations will be long maintained, unless fears should hereafter arise respecting the growing crop.

The abundance of all kinds of keep for cattle, throughout the spring, has unquestionably caused a decreased consumption of oats; and the promise of an unusually heavy hay crop has also had its influence.

English beans have come sparingly to hand, and although the demand has, as is usually the case during the spring and summer months, been on a restricted scale, the limited character of the supply has prevented prices giving way, and quotations are much the same at the close as they were in the commencement of the month. In foreign beans next to nothing has been done; those which have arrived from abroad have been warehoused in bond, importers having been unwilling to pay the existing high rate of duty.

In the early part of the month there was a good demand for peas for shipment to Scotland, but latterly the inquiry has slackened, and neither white, grey, nor maple peas are now quite so dear as they were at the close of April. A few parcels have recently been received from the north of Europe: still the stock under lock in the kingdom is trifling; the prospects for the next crop being, however, generally regarded as promising, prices are more likely to recede than advance.

We shall here close our notice of the home trade, and devote the remainder of our space to record the changes which have taken place in the wheat trade at the principal foreign markets.

Less influence seems to have been produced on prices abroad, by the important fall which has taken place in the value of wheat in the English markets, than might have been expected; the confidence of foreign merchants, like that of the holders of bonded wheat at home, has been upheld by the hope of a 4s. duty. Very few British orders having, however, been sent out, business has been extremely inactive for some time past, at the leading continental ports.

The latest accounts from Danzig state that the shipments had been quite unimportant; but with scarcely any foreign demand, and comparatively little speculation, quotations had been nearly supported. This had been partly caused by the insignificance of the supplies from Poland, and the belief that the arrivals down the Vistula would, throughout the summer, be on a very restricted scale. The best high mixed wheat in granary, the growth of 1842, had at no period been offered below 50s. to 51s. per qr. free on board; and mo-

derately good high mixed had brought 47s. to 48s. per qr. Freights had rather risen, and for first class vessels, 3s. 6d. to 4s. to London and the east coast of Great Britain, and 4s. 6d. to 5s. for Liverpool, had been asked.

From Konigsberg the advices are altogether without interest; quotations being relatively higher there than at Danzig.

At the Lower Baltic ports there appear to be very trifling stocks of wheat generally; and as the farmers had brought forward rather scanty supplies, prices of wheat had been kept up too high at the principal markets, as compared with the value of the article here, to admit of the few orders sent out by our speculators being executed. Good heavy qualities of wheat, such as have lately been obtainable at Mark Lane at about 48s. per qr., have been held on the other side at 45s. to 46s. per qr., free on board. Taking one port with the other, the freight to London would probably average 3s. 6d. per qr.; and further charges would have to be incurred for insurance and sound dues; the London market is, therefore, by far the most advantageous for those disposed to speculate in foreign wheat. The case is similar as regards Hamburg; and there can be no doubt that all the wheat recently imported would, if sold at present prices, entail a rather heavy loss on importers. The period for which the export of wheat from Holland and Belgium was forbidden in the autumn of last year will expire in July; but, as prices of the article are higher in both countries than in Great Britain, and shipments of bonded wheat continue up to the present time to be made from hence to Rotterdam and Antwerp, there seems little prospect of supplies reaching us from the Netherlands. In some of the south eastern countries of Europe, prices of wheat have, within the last month or two, gradually declined; and Polish Odessa and similar qualities were, according to the most recent accounts, obtainable at the principal ports in the Mediterranean at 35s. to 37s. per qr., free on board. At Odessa the value of the article had also given way at the date of our last letters; the best parcels being then obtainable at a price, rendering the cost on board 30s. per qr.

From America we have reports of recent dates by the Great Western steam ship. The dull advices from Great Britain, together with the generally favourable weather for the growing crops, had caused rather an important decline in the price of flour at the chief markets in the United States. At New York good brands of western had been sold at 4 d. 6s. c., or rather under 20s. per brl.; and at Baltimore the price of Howard-street flour had fallen to four dollars. These rates are certainly low, and we shall probably receive a larger quan-

tity of flour from the other side of the Atlantic than usual during the summer.

From Montreal we learn that the shipping season had commenced in earnest, and that large consignments to the English markets were in progress of being sent off.

CURRENCY PER IMPERIAL MEASURE.

MAY 25.

WHEAT, Essex and Kent, new, red	48	54	White..	56	62
Old, red.....	50	56	Do.	59	62
RYE, old	34	38	New....	58	40
BARLEY, Grinding, 26 27 Malting	30	32	Chevalier	33	—
Irish	24	26	Bere ..	25	26
MALT, Suffolk and Norfolk.....	58	63	Brown..	56	60
Kingston and Ware.....	60	—	Chevalier	65	—
OATS, Yorksh. & Lincolnshire, feed	24	27	Potato..	26	28
Youghall and Cork, black..	22	23	Cork, white	24	25
Dublin	24	25	Westport	26	—
Waterford, white	21	23	Black ..	23	24
Newry	27	23			
Galway	19	20	Potato..	27	28
Scotch, feed	25	26	Limerick	25	27
Clonmel	28	—	Sligo ...	24	26
Londonderry.....	34	38	Old, small	48	50
BEANS, Tick, new	36	—	Maple ..	36	—
PEAS, Grey	38	44	Boilers..	42	44
White	53	58	Suffolk 42	—	—
FLOUR, Town-made 50	53	58	per sk. of 280 lbs.		
Stockton and Norfolk 40	41	44	Irish 42	44	

FOREIGN GRAIN AND FLOUR IN BOND.

WHEAT, Dantzic	52	54	fine	—	58
Hamburg.....	48	50			
Rostock	48	53			
BARLEY.....	20	22	24		
OATS, Brew	22	24	Feed ...	19	20
BEANS	27	28			
PEAS	32	—			
FLOUR, American, per brl	25	26	Baltic ..	—	—

IMPERIAL AVERAGES.

Week ending	Wheat.	Barley.	Oats.	Rye.	Beans.	Peas.
April 11th	56	0	30	9	22	9
18th	55	10	30	5	22	9
25th	55	0	30	1	23	4
May 2nd.....	56	5	29	8	23	7
9th	56	8	29	7	23	9
16th	57	0	29	4	24	1
Aggregate average of the six weeks which regulates the duty.	56	3	29	11	23	4
Duties payable in London till Wednesday next inclusive, and at the Outports till the arrival of the mail of that day from London ..	16	0	9	0	5	0
Do. on grain from British possessions out of Europe ...	3	0	1	6	0	6

COMPARATIVE PRICES OF GRAIN.

WEEKLY AVERAGES by the Imp. Quarter, from the Gazette, of Friday last, May 22nd, 1846.	AVERAGES from the corresponding Gazette in the last year, Friday, May 23rd, 1845.				
WHEAT.....	57	0	WHEAT	45	9
BARLEY	29	4	BARLEY	30	0
OATS	24	1	OATS	21	9
RYE	33	5	RYE	29	7
BEANS	35	11	BEANS	37	3
PEAS	34	11	PEAS	37	0

PRICES OF SEEDS.

MAY 25.

SEED, Rape.....	24l.	26l.	Irish ..	—l.	—l.	per last.
Ditto, new	25l.	—l.	per last.			
Linseed, Baltic..	40	44	Odessa	45	46	
LINSEED, Baltic and Russia,	38	40,	finer sorts,	43	45	per qr
Mustard, white	10	11	brown —	—	per bush.	
Linseed Cakes, English..	—10l.	10s.	to 11l.	0s.	per 1000	
Linseed, English, sowing	54	60	crushing	43	45	per qr

Carraway	44	46	new ..	47	48	per cwt
Coriander	10	13	per cwt.			
Mustard, brown, new....	10	11	white..	9	11	p. bush
Hempseed	35	38	per qr.			
Trefoil	17	24	old..	—	new 28	
Mediter. & Odessa	44	45				
Canary, 44	47					

POTATO MARKET.

SOUTHWARK, WATERSIDE, May 25.

There were no fresh arrivals to this market during the week; notwithstanding, there was but little demand, except for the very best samples; all inferior samples were a complete drug. Owing to the high prices, the warm weather, and the abundant supply of vegetables to the various metropolitan markets, the consumption of Potatoes was considerably diminished.

The prices ranged as follow:—York Reds, 140s. to 180s., ditto Regents, 40s. to 120s.; Perth Reds, 115s. to 120s.

PRICES OF HOPS.

BOROUGH, MONDAY, May 25.

The market for Hops is rather firmer, as the advices from the plantations notice an increase of fly. To these rumours, however, not much importance is attached, as the appearance of fly is usual at this period. There is but a limited quantity of Hops on offer. Mid. and East Kent pockets, 5l. 12s. to 9l.; Weald of Kent pockets, 5l. 5s. to 6l. 10s.; Sussex pockets, 5l. 5s. to 6l. 6s. per cwt.

WORCESTER, (Saturday last.)—Within the last few days the Hop plantations throughout the district have been attacked with fly, the bine in many gardens being already swarming with the insect, which has caused considerable apprehension in the minds of the planters as to the fate of the crop, which has so often suffered by the ravages of these little animals. These unfavourable appearances have given life to the market, and caused an advance in prices of 4s. to 6s. per cwt. since last Saturday, and several planters and speculators have withdrawn their hops from sale for the present, in anticipation of shortly realizing higher rates.

MAIDSTONE, May 21.—For more than a week past we have had a succession of very wet, cold, and squally weather, quite unusual for the latter part of May, attended in some places with heavy hailstorms, which have cut and battered the bine to some extent. The hops have thus been considerably checked in their wild career, and perhaps beneficially so, for they were twining round the poles at a railroad pace, producing strong, long-jointed, and unfruitful bine, and getting much too forward. The extreme wet and cold nights, with strong winds, have turned the hops very yellow; but this, we trust, is only temporary, as, with a little warm, genial weather, they will soon resume their wonted healthy hue. We hear of fly generally. At some places a considerable increase has appeared within the last day or two; but, with a continuance of such weather as we have lately experienced, it is not probable that they will do much execution. The fly seldom makes a successful attack on hops when the atmosphere is low in temperature and the bine yellow. It has made its appearance this year at an earlier period than usual, which is also in favour of the hops. This afternoon (Thursday) the weather is warmer, and a favourable change appears to be taking place.

WOOL MARKETS.

BRITISH.

LEEDS, May 22.—There has not been any change in this branch of trade during the present week. The demand is steady but not brisk, and prices are firm.

WAKEFIELD, May 22.—There has been more life in the wool trade within the last two or three weeks, and extensive sales have been made on rather better terms than could have been realised for some previous weeks, and the aspect of the market may be reported firm.

PONTEFRAC, MAY 16.—This being the first market of the season there was very little wool shown, and the greater part being hog met ready sale at 15s. per st.

LIVERPOOL, May 23.

SCOTCH.—There has been a little more doing in Laid Highland this week, without any alteration in price. White Highland is still neglected. There is a moderate demand for good Crossed Cheviot, at about late rates. Inferior of both kinds continue neglected.

	s.	d.	s.	d.
Laid Highland Wool, per 24 lbs	8	9	10	3
White Highland do	12	0	12	6
Laid Crossed do, unwashed	9	9	11	6
Do, do, washed	11	0	13	0
Do, Cheviot do, unwashed	10	0	12	6
Do, do, washed	12	6	16	6
White Do, do	22	0	24	0

FOREIGN.—The public sales are progressing in London, where the attention of the trade is directed at present; there is, consequently, little doing here at present.

FOREIGN.

The wool sales have been on daily since our last, and have gone off with tolerable freedom as regards the business done or the biddings, though not at higher rates than those current privately during the past month, or 1d. to 1½d. per lb. lower for colonial, and 1d. for Spanish, than at the last series of public sales. The auctions will continue, it is expected, all this week.

The following sales have been held since our last:—

On Saturday, the 16th, Mr. H. P. Hughes offered 1,181 bales. Of this quantity 242 bags Australian sold at 1s. 6½d. to 1s. 11½d. for sheep's clean, and as high as 2s. 10½d. for lambs'; 140 bags Van Diemen's Land realized 1s. 4½d. to 1s. 7½d. for sheep's, and 1s. 5d. to 1s. 6d. for hoggets; 168 bags Port Philip went at 1s. 3½d. to 1s. 5½d. for washed sheep's, and at 1s. 6d. to 1s. 8½d. for lambs', 351 bags Cape, fine, brought 8½d. to 1s. 6½d. for clean sheep's, and 1s. 3½d. to 1s. 6½d. for lambs'; 182 bags South Australian sold at 1s. 1½d. to 1s. 5½d. for clean sheep's, and 1s. 2½d. to 1s. 6d. for lambs'. Some Germanized Odessa, damaged, sold at 1s. 1½d.

On Monday Messrs. Marsh and Edenborough put up 1,094 bales; 191 bales were South Australian, sold by order of the Court of Directors of the South Australian Company, the quotations realized being 1½d. to 1s. 5½d. for clean sheep's; 404 bales Australian for account of the importers, went at 11d. to 2s. 3½d. for snow white, and at 1s. 8d. to 2s. for lambs'; Van Diemen's Land, 111 bales, brought 1s. 1½d. to 1s. 8d. for clean sheep's, and 10d. for greasy; Cape, 388 bales, sold at

7½d. to 1s. 6d. for clean sheep's, and at 1s. 2½d. to 1s. 6½d. per lb. for lambs'.

Messrs Southey and Son offered 1,431 bales on Thursday last; 635 bales Van Diemen's Land sold at 1s. 2½d. to 1s. 9d. for sheep's, and 1s. 2d. to 2s. 2½d. for lambs'. Australian clean sheep's brought 1s. 1d. to 1s. 8d., and 364 bales Port Philip at 1s. 2d. to 2s. 3d. for washed sheep's, and 1s. 5½d. to 1s. 11d. for lambs'; United States Merino sold at 1s. 5d. to 1s. 0½d. for sheep's, and 1s. 1½d. to 1s. 5d. for damaged.

On Friday Messrs. J. T. Simes and Co. offered 1,639 bales of wool, and 58 dozen of sheep skins; Cape sold at 8d. to 1s. 5d. for clean, and lambs' at 10½d. to 1s. 4d. per lb.; Van Diemen's went at 1s. 1½d. to 1s. 10½d. for clean sheep's, and at 1s. 10d. to 2s. 4d. for lambs'; Port Philip brought 1s. 1d. to 1s. 9d. for sheep's clean, 1s. 0½d. to 2s. 2d. for lambs', and 1s. to 1s. 1½d. for greasy; United States Merino brought 1s. 2½d. to 1s. 4d., and sheep skins 1s. 10d. to 2s. 10d. per lb. There were 253 bales Australian, 461 of Van Diemen's Land, 506 of Port Philip, 299 of Cape, 12 of New Zealand, and 28 of the United States comprised in the total of 1,639 bales.

Mr. William Hull sold 466 bales on the same day. There were 85 bales Van Diemen's, which sold at 1s. 3½d. to 1s. 11d; 35 of Sydney, which brought 1s. to 1s. 1d.; 287 of Spanish, which realized 11d. to 1s. 8d., and 2s. 1½d.; and 11 Buenos Ayres, 3½d. to 3¾d. per lb.

LEEDS, May 22.—The demand for foreign wools has been more active this week, and a fair quantity changed hands. Prices may be quoted the same as for the last few weeks.

MANURES.

Subjoined are the present prices of several sorts of Manure:—

Agricultural Salt, 32s. per ton	Muriate of Ammonia, 20s. to 24s. per cwt.
Alkalies, 28s. and 42s. per cwt.	Muriate of Lime, 6s. per cwt.
Boast and Co's (Bow) Inorganic Manures, from 6s. to 11s. per cwt., according to crop	New Bristol Manure, 8s. per cwt.
Boast's Guano, 9l. 9s. per ton	Nitrate of Soda, 16s. per qr.
Carbon, 12s. per qr.	Nitrate Potash (saltpetre), 25s. to 26s. per cwt.
Chie fon, 21s. per cwt.	Patent Disinfected Manure 13s. 6d. per qr.
Chloride Lime, 28s. per cwt.	Petre Salt, 4l. 10s. per ton
Clarke's Compost, 3l. 12s. 6d. per hhd., sufficient for three acres	Potter's Guano, 10l. per ton.
Fothergill's Gypsum, 35s. per ton.	Preparation for Turnip Fly 10s. 6d. per pakt., sufficient for three acres
Fothergill's Phosphate of Lime, 14s. per cwt.	Rags, 4l. to 4l. 10s. per ton
Graves, 6l. 10s. per ton	Rape Cake, 6l. per ton
Guano, Peruvian, 10l. 10s.; Bolivian, 9l.; African, 6l. 6s. to 7l. 10s. per ton, according to analysis	Rape Dust, 6l. 6s. per ton
Gypsum, at the waterside, 35s. per ton	Soap Ashes, 10s. per ton
Highly Concentrated Manure, 30s. per qr.	Soda Ash, 14s. to 16s. per cwt.
Humus, 14s. per qr.	Sulphate Soda, 6s. per cwt.
Hunt's Bone-dust, —s. per qr.	Sulphur for Destroying Worm on Turnips, 12s. per cwt.
Hunt's Half-inch Bone, —s. per qr.	Sulphuric Acid, 1½d. per lb.
Hunt's Stuff Graves, 3s. 6d. cwt.	Superphosphate of Lime, 8s. per cwt.
Hunt's new Fertilizer, 18s. 4d. per qr.	The Liverpool Abattoir Company's Animalized Manuring Powder, 2l. 10s. per ton
J. T. Hunt's Artificial Guano, 9l. per ton	The Urate of the London Manure Company, 4l. 4s. per ton
Manure Powder, 16s. per qr.	Willey Dust, 4l. 4s. per ton
	Wolverhampton Compost (Alexander's), 12s. per qr., subject to carriage to London, or forwarded from Wolverhampton

END OF VOLUME XXIV.



